

**Palaeolithic Art: More than Meets the Eye? An Object
Biography Approach to Engraved Stone Plaquettes from the
Magdalenian Site of Montastruc, South-Central France.**

**3 Volumes. Volume 3
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Appendix 5. Table of stone tools by type

Artefact type	Total	Total as percentage
Endscraper	405	2.79
Double endscraper	20	0.14
Micro endscraper	41	0.28
Endscraper burin	106	0.73
Endscraper on flake	33	0.23
Endscraper perçoir	1	0.01
Dihedral burin	655	4.51
Burin	55	0.38
Dihedral/angle burins	74	0.51
Dihedral burins offset and angle	91	0.63
Dihedral burins on broken blade	70	0.48
Multiple dihedral burin	84	0.58
Burin on break	14	0.10
Burin de lacan, burin de peroquet	13	0.09
Burin on truncation	56	0.39
Burin on retouched truncation	110	0.76
Transverse burin	32	0.22
Magdalenian shouldered point	3	0.02
Truncated blade	4	0.03
Retouched blade	104	0.72
Notch and raclette	13	0.09
Backed bladelet	1348	9.28
Retouched bladelet	21	0.14
Denticulated bladelet	38	0.26
Azilian point	20	0.14
Miscellaneous retouch	33	0.23
Retouched flake	8	0.06
Pièce esquillée	7	0.05
Chopper	1	0.01
Blade	882	6.07
Bladelet	5305	36.54

Unmodified bladelet	3000	20.66
Burin spall	659	4.54
Crested blade	238	1.64
Perçoir	279	1.92
Core	137	0.94
Handaxe	1	0.01
Debitage	369	2.54
Debitage flake	52	0.36
Quartzdebitage	26	0.18
Utilised stone	16	0.11
Dihedral angled burin	44	0.30
Carnelian jasperdebitage and calcite	52	0.36
TOTAL	14,520	100

Artefact group type	Tool types composing category	Total	Total as percentage
endscrapers	endscraper, double endscraper, micro endscraper, endscraper on flake	499	3.44
burins	dihedral burin, dihedral/angle burin, bihedral burin offset angle, dihedral burin on broken blades, burins on breaks, burin de lacan, burin de peroquet, burins on truncations, burins on retouched truncations, transverse burins, burins	1214	8.36
blades	blades, crested blades, truncated blades, retouched blades	1228	8.46
points	Magdalenian shouldered points, Azilian points	23	0.16
piercers	Perçois	279	1.92
debitage	quartzdebitage, jasper and calcitedebitage, flintdebitage,debitage flakes	499	3.44
Combination tools	endscraper burins, endscraper perçoirs,	191	1.32

	multiple dihedral burins		
bladelets	bladelets, unmodified bladelets, backed bladelets, denticulated bladelets, retouched bladelets	9712	66.89
Burin spalls	Burin spalls	659	4.54
cores	cores	137	0.94
other	notches and raclettes, utilised stone, pièce esquillée, retouched flakes, handaxe, utilised pieces, miscellaneous retouch, chopper	79	0.54
TOTAL		14520	100

Appendix 6. Photographs of a random sample of stone tools by type

Appendix 6. Photographs of a random sample of stone tools by type

Appendix 6 is composed of a systematic series of images from each tool type encountered in the stone tool assemblage at Montastruc. The structure of the appendix is wedded to the structure of the collection as stored in the British Museum. Images are presented by box, each box typically storing a single type of stone tool. A random assortment of stone tools of a given type was selected from each box, in each case emphasising the range in size, material, and colour evident in the assemblage. Taken together, the images presented act to provide a sense of the range and diversity of tools at Montastruc, as well as the materials they were made from. The images are presented digitally. The images are organised and presented via the British Museum box numbering system. Each file is titled according to the box in which it can be found, the box number in turn refers to a location within the Sturge racking, providing the precise row and location. As such, using the title of the folder, the physical stone tools imaged could be located within the British Museum for further analysis. The images are of a working shot standard and were produced rapidly to facilitate the full analysis of the stone tool assemblage and due to time constraints. As such, a compromise has been made in quality and composition, favouring quantity and range over a publishable standard of photography. It should be noted that in all images, the white background with 'studded' texture acts as a scale, with the distance between each 'stud' being c. 1mm. Images have been only minimally processed by cropping extraneous background detail or white space, and additionally via automatic white balancing using GIMP software to compensate for the variable and typically low ambient light within the Sturge, Franks House, where the images were taken.

Appendix 7. High-resolution 3D models of plaquettes

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Appendix 7 is a full series of high-resolution 3D models of the engraved stone plaquettes from Montastruc. Each 3D model is labeled according to its palart number, according to the British Museum reference for each object. This is the standard number used throughout the thesis in all cases. The models were produced using a 3D Structured Light Macro Scanner, owned by the Fragmented Heritage Project, University of Bradford. The scanner was mounted on a tripod and used in conjunction with a turntable, controlled using FlexScan 3D (v.3.1.1) software. The scanner was set for an 80mm field of view, and the rotary table was set for six scans per full rotation (60° intervals). Scans were aligned and combined in FlexScan 3D and the final model was exported as an object file. MeshLab (v.1.3.3) software was used to analyse the resultant model. MeshLab is free, open source software and it is required to successfully open and manipulate the 3D models presented in appendix 7. The latest version of the software can be downloaded here: <http://www.meshlab.net/> The models are presented at their full resolution and will be very slow to manipulate on low specification or older machines. However, it is recommended to manipulate the models at the highest resolution possible, to avoid loss of detail and clarity to engraved lines. Those models without anthropogenic modification to the reverse surface are presented with obverse surfaces only to reduce file size and so the speed at which the model can be manipulated. To draw out engraving from the plaquette, utilising Lambertian radiance scaling and/lit sphere radiance scaling can aid in highlighting engraved lines. To activate and manipulate these properties, click on the renders tab → shaders → radiance scaling → Lambertian radiance scaling and/or lit sphere radiance scaling.

Appendix 8. Sieveking results table

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Appendix 8 presents a summary table of the findings of Sieveking from her 1987(a) analysis of the engraved stone plaquettes and organic art from Montastruc. Alongside this, results generated by the author are presented for the engraved stone plaquettes, with an expanded field to include additional attributes of interest. These analyses were conducted blind, and so the high concordance between studies, consistent with yet earlier published descriptions (Smith 1902) suggest an accurate recognition of the engraving present to each surface. The different sets of results are presented as a single excel workbook, with each set of results accessible on a different sheet within the workbook.

Appendix 9. Additional organic objects macroscopic descriptions

Box 334 PalOrn 600

Heavily worn fragment of scallop shell, part of the edge with hinges and the rippled surface. The breaks look to be old based on colour. A perforation is present on the flat portion of the shell and this is likely old and anthropogenic. Some dark discolouration across the outer surface may be post-depositional staining. The perforation has been made at an angle through the piece. The reverse has sharper edges perhaps suggesting the hole was punched out with a bone tool rather than rotationally worked with a stone tool. The reverse surface is similarly discoloured a dark grey/black in places. Note this shell likely has a coastal origin.

Box 334 PalOrn 604

Shell, complete, likely of coastal origin. The species is *Laevicardium Crassum* (egg cockle). The shell is white in colour to the outer surface with some brown colouration. The outer surface looks to be eroded with the ridges extremely worn and rounded. There is no obvious sign of any modification or perforation. However, it remains of interest due to its likely coastal origin and its likely transport for perforation. The piece looks almost complete. Likely a bivalve with the corresponding valve missing. No sign of any heating/breakage/additions, with some occasional dark speckling likely post-depositional staining. Some occasional chipping to the edge. Some traces of orange sediment adhering to the surface in places. The inside of the shell is lighter in colour with some brown sediment patches and occasional black patches.

Box 334 PalOrn 601

Mammal tooth, likely a cervid incisor. There is a clear anthropogenic perforation to the root, suggesting the piece is a bead. The root has been thinned to both sides before being perforated, likely to avoid breakage during perforation. The hole runs side to side through the piece. So, if it were strung it could sit in the same orientation as the tooth would in the mouth of the animal. The tooth is small in size – might this suggest the age of the animal – likely young? The perforation is thin and elongated, perhaps suggesting a cutting motion, but has a small and rounder area where the main perforation has been placed. The edge of the perforation looks rounded which is suggestive of wear. The front and back of the tooth similarly look lustrous and polished, again perhaps suggestive of polish from wear. There is no engraving to the tooth or root. This polish could be attrition of the animal's life. Likely thinned, then cut, then finally perforated, cut marks evident under the microscope.

Box 334 PalOrn602: this looks to be the same type of tooth as PalOrn 601, though it has broken in half, this seems to have been associated with the perforation produced through the root. It looks as though this has been worked the same way as PalOrn 601. It has an additional crack running through it, also associated with the perforation. Unclear if the perforation was successful and the piece was subsequently broken or broken during manufacture. The tooth looks polished but this is likely wear from use by the animal. Microscope supports working in the same way as PalOrn 601, with evidence for cutting and a long groove and thinning of the root. There is no clear evidence of engraving to the tooth or the root. No trace of heating/colourants or sediment. The piece has been thinned from both sides. The break could be an older feature? The hole has again been placed through the side of the tooth.

Box 334 PalOrn 603

Small tooth, possibly of the same type as PalOrn 601 and 602. The tooth itself looks to be heavily worn and is a deep brown compared to the others which were white. The perforation is again made through the side of the tooth and the root has been thinned. The perforation is ovoid in shape and this could be a product of wear and/or production. There could be engraving across the tooth in the form of three fine engraved lines across the tooth. The perforation looks to run through the tooth at an angle rather than straight through. It may be the case that the perforation has been made in the front/back orientation rather than side/side. The working of the perforation looks to be the same to the other side and again the perforation looks to have been worked at an angle. There is some red/orange colouration around the perforation, this may be traces of red ochre though it could be sediment. The colouration within the groove is more likely to be sediment.

Box 334 AO3

Fragment of long bone with epiphysis, broken in two places and split longitudinally. Seven long grooves run longitudinally down the bone, disrupted by the breakage. The breakage looks old based on colour. The object has no discernible function in its own right. It can't be ruled out that these lines continue decoration/art. However, it seems more likely that the piece has been used as a raw material for the production of bone splinters that may in turn have been used to make needles. This is viable as needles are known from Montastruc. This

is significant as it would suggest both the making and using of needles at Montastruc. Some red/orange traces within grooves may be ochre but are more likely to be traces of sediment. The reverse of the piece has patches of red felt and glue from an earlier mounting with some patches of damage where bone has been removed when it has been removed from the mount. This also suggests all of the breaks are old and could be ancient taphonomic or ancient anthropogenic activity.

Box 334 AO4

This object looks to be a close parallel to AO3 above. This looks to be the same elements as AO3 and worked in the same way. This piece has six grooves, possibly extraction of bone as blanks for needled. Bot AO3 and AO4 are confirmed needles cores. This suggests a complete reduction sequence for needles at the site, using and depositing. Looking to be the same bone element that has broken in the same way. This is probably ancient post-depositional breakage. There also seems to be a lateral groove running around the end of the bone that cuts through some of the longitudinal grooves, likely this was engraved first. The reverse of the piece has patches of felt and glue from an earlier period when the object was mounted. The age of the break is likely old but based on presence of red felt it may have been broken when it was removed from the display board. This piece looks to be complete and hasn't split longitudinally.

Box 334 AO11

Point, likely made from antler, worked to a fine point. The proximal has been broken so the base is missing. There is some evidence for fine longitudinal striations to the piece, likely a relic of the smoothing and shaping process. The delicate size and shape of the implement may link to the type of animal that was to be hunted with this piece of equipment. Difficult to be entirely sure without the proximal component. There is no traces of heating/ochre/charcoal etc. to the piece. There is no sign of any decoration to the piece. The breakage is old based on colour, though it could be taphonomic or post-depositional. The piece is semi-angular in cross-section and this again is a relic of production as the piece has been cut and shaped. Possible evidence for a blow which may have been caused by the break – this could be anthropogenic or taphonomic.

Box 334 AO1

Large fragment of long bone, broken longitudinally along its length. The breakage looks old based on colour. a lateral break looks to have been repaired and glued and this partly disrupts a series of grooves running longitudinally down the length of the piece. There are two grooves and these are long, thin, deep and parallel. It is possible the space between the grooves is actually the splinter that was never removed. Equally, they could be small, localised splinter removals. It is unlikely that the piece constitutes a core but rather a core for splinter removal. Fine striations are present along the length of the piece and this is likely a product of preparing the surface for the grooves and splinter removal. The breaks are relatively regular to the long axis and the piece may have broken along the lines of the other long grooves perhaps. The reverse surface confirms that this is bone rather than antler. Confirmed, the edge/reverse shows signs of grooving, suggesting the piece has broken along the lines of the additional splinter removals. Legitimately this piece can be termed a splintered core. An angular cut suggests a larger removal from this side, possibly the extraction of a point. All breaks look to be old. There is no sign of any heating/ochre/red felt etc.

Box 334 AO12

Small double bevel ended point, likely made of antler and light brown in colour. The cross section of the piece is rounded to sub-angular likely associated with the production and shaping of the piece. Some of these angular cuts may have been used to shape what look like almost proto barbs, though these are only a few mm deep they look purposeful. The small and relatively delicate nature of the object may suggest the type of animal that was to be hunted. The bevel has functional grooves cut laterally from both directions to give a friction grip to a multi component point. The very tip of the piece is broken and this is likely old based on colour. The cross section is likely more square in shape. A modern break to the middle of the piece has been repaired with some traces of glue present and some lighter coloured bone exposed. The reverse of the piece has a bevel worked in the same way with lateral grooves to provide a friction grip. Spongy bone has been exposed during the shaping process and this suggests the piece is made from an antler tine. Each of the grooves to the bevel look to have been made with multiple strokes to create each groove. The reverse looks to have been worked primarily in one direction.

Box 334 AO13

biserial barbed point, light yellow/bone in colour. There are some traces of deep brown sediment across the piece. The piece is broken to the distal end (tip) and this break looks to be old based on colour, perhaps anthropogenic but feasibly this could be post-depositional. The piece has a raised lateral band of bone where both sides have been reduced and then sections removed to create the barbs. The proximal end (base) looks to be gently beveled at least to one side. There are three barbs to one side and two barbs to the other side. The barbs to the left side are all broken and they look to have broken in antiquity. More remains of the barbs to the right side but these are similarly damaged in antiquity. Some deep lines are present where sections have been cut away to produce the barb. There are deep longitudinal striations associated with the working of the barbs and removal and shaping of the gaps in between. A series of diagonal lines are to both sides between the barbs but especially to the proximal end. This could be functional or possibly decorative. The raised bar of bone has several diagonal lines in similar fashion which could be similarly functional or possibly decorative. A series of short lateral lines also seem to decorate this bar to the medial portion and these are much finer. The piece has likely been made from antler, likely a tine. The reverse reveals spongy bone and confirms the piece is made from antler. The diagonal lines are actually cut marks in association with the removal of the bone between barbs and are working traces. Similarly, a long cut mark to the proximal side with two barbs also looks to be a working trace.

Box 334 AO14

Long double bevel ended point, likely made from antler and light brown in colour. The piece may have been worked from a large tine or part of the beam of the antler. The bevel again has a series of curving grooves formed within multiple lines in each case. The piece is broken in two places and has been repaired, both look to be recent based on the colour of some visible bone within the breaks. The cross section is likely rounded but somewhat square given the slightly angular edges where the main flat plains have been reduced and smoothed to leave slightly angular edges. The tip of the piece is deep brown/black in places – this may be sediment or could be some other type of residue. Some fine, parallel, longitudinal striations run along the length of the piece and this is likely a remnant of the smoothing and shaping process. Some damage to the bevel looks to be old. The size and shape of the piece may link to the type of animal to be hunted and the hunting strategy to be employed. The distal portion may hold some decoration in a vaguely 's' shaped arrangement but this is too eroded to be able to discern the nature of any design. To the

reverse, the quantity of material that has been removed suggests the piece was likely mounted and bone has been ripped away when removed from the display. Spongy bone is present along the reverse, confirming the piece is antler. A bevel is present and grooves have been added in the same way as the obverse. The break to the bevel can be confirmed as old to the reverse. No other signs of heating, ochre etc. to the piece. The repair has likely caused a curvature along the length of the piece.

Box 334 AO2

Large fragment of bone, yellow/grey in colour and with breakage. Some of the breakage is old while some of the breakage looks recent based on colour. A large, deep groove runs diagonally through the piece. This is unlikely to be decoration, the piece having no discernable function, and is more likely a removal negative for a point or large bone splinter. The bone is likely part of a thick-walled long bone fragment. No immediately discernable signs of heating, ochre, etc. to the piece. All break are old except the very tip of the piece near the groove where the break is clearly recent based on colour. The change in colour is likely based on staining from surrounding sediment and post depositional action. The breakage may be post-depositional but is certainly ancient. The break disrupts the groove and this suggests the piece was once more substantial some fine longitudinal cracking present which is likely erosional. The reverse reveals spongy bone and thick bone walls. The colour is dark grey/brown and is likely caused by adhering sediment. A localised lighter patch may be a result of minor damage from mounting during an earlier phase of curation. No signs of decoration or further modification to this surface.

Box 334 AO5

Long, thin point, yellow in colour and tapering to a fine point with the tip of the point absent due to breakage. The piece is likely worked from bone and displays some longitudinal striations from reduction and shaping. There is no obvious sign of any decoration across the surface. There are fine striations across the surface and these are presumably linked to the working and shaping of the piece. Both the proximal and distal ends are broken and these breaks look to be old based on colour. There are some localised traces of brown sediment across the surface. The raw material looks to be bone with the inner surface smooth and with no spongy interior bone present, giving the reverse surface a concave shape. No sign of any heating, ochre etc. across the surface.

Box 334 AO6

Medium sized fragment of bone, yellow/grey in colour, likely a fragment of a long bone with evidence of breakage to all sides. The breakage looks to be largely ancient based on colour, though some areas of breakage look to be recent based on the more vibrant yellow colouration, perhaps associated with the piece formerly having been mounted. Two grooves run longitudinally down the length of the piece and they seem to be increasingly converging to one end though don't actually meet. It could be an attempted removal of a point. The piece doesn't look functional in its own right, though it is fragmented. It could be decoration to the piece though this seems less likely without a discernible function. Some localised brown/grey patches look to be sediment to the surface. The reverse of the piece is deeply concave, with no spongy bone present. The raw material is a fragment of long bone shaft. Recent breakage can be associated with traces of red felt and glue, suggesting the piece had been mounted and damage caused during removal. There are no traces of modification to this surface.

Box 334 AO7

Fragment of rib bone, broken to both ends. One end looks to be old based on colour while the other looks more recent based on colour. The piece is deep brown in colour and lighter yellow to the breaks with some fine longitudinal striations are likely a result of working to smooth the piece. There are a series of lines running diagonally across the piece, some of which intersect and cut across each other. This parallels some of the pieces seen in the pal art sequence. This is probably decorative. While the piece is broken, it is difficult to see how these markings might relate to a function. The engraved lines are relatively fine and have perhaps been made only with a single stroke. The nature of the lines suggests they were produced together and by the same person. No decoration is present to the edges of the piece. No sign of any heating, ochre etc. across the piece. The reverse is similarly dark in colour with three patches of glue spread across the surface. This suggests the piece was mounted and the breaks likely occurred during removal. A series of engraved lines also present to this surface, though they are more difficult to discern, not least due to disruption by the overlying glue. The lines are diagonal but more dispersed from one to the other when compared to the obverse surface. These lines seem decorative rather than functional.

Box 334 AO8

Heavily eroded fragment of antler tine, brown patches with adhering sediment but largely grey/yellow in colour. The piece is broken and cracked, both of which seem to be old based on colour. There are two lines engraved into the piece which are gently converging but don't actually meet, much as seen in AO6. This could be a failed attempt to extract a point via groove and splinter. It could be decoration in its own right. Finding this pattern on multiple objects doesn't allow us to discern which option is more viable – both could fit. No obvious sign of any heating, ochre etc. across the surface. Points of breakage/cracking may be a result of weaknesses caused by additional grooves. It is difficult to be sure due to the break in the piece. The reverse surface reveals a repaired break, some traces of glue and some fresher, yellower patches of bone, suggesting the piece may have been mounted during an earlier phase of curation and may have been damaged during removal. There are no signs of any decoration or working to this surface.

Box 334 AO10

Part of a point with a break to both ends, old based on colour. The colour is deep brown. The raw material is likely antler, one side of the rounded piece composed of spongy bone. The piece has an almost barb to the top surface created by an angular cuts that intersect to leave a triangular raised area of bone. However, this isn't fully realized as a barb. The piece could be unfinished or this could be an embellishment to a more typical rounded point, as seen in some of the 'notched' pieces. There is no sign of any heating, ochre etc. to the piece. As the piece is a medial fragment it is difficult to be exactly sure of the nature of the point. The reverse is composed of spongy bone and has traces of glue and red felt across the surface suggesting the piece has once been mounted. A small flake of one has been removed leaving a fresh yellow surface and this was likely caused by this removal. The breaks to either end are definitely old. The piece is relatively square in cross-section, the piece having quite angular edges and flat surfaces. There are some additional grooves cut into the edge of the piece in a diagonal orientation and this roughly correlates to the position and orientation of the previously described 'proto-barb'. Without the full piece decoration can't be ruled out for this grooving but it seems more likely to be a functional trace.

Box 334 AO9

Small medial fragment of uniserial barbed point, made from antler, and showing signs of erosion. The piece is broken along the barbs and at both ends. The barbs have been

created by perforation – is this definitely a barbed piece? The method of working could suggest this is something else rather than a barbed point. Too fragmentary to determine an alternate form. The piece is yellow/brown in colour and all breaks look to be ancient. No sign of any heating, ochre etc. across the surface. The top of the piece looks to be relatively flat with a noticeable change in texture where the piece may have been cut and shaped. No sign of any decoration across the surface. The reverse surface is composed of spongy bone suggesting the piece is made from antler. There is traces of felt (red), as well as localised traces of glue, across the surface, suggesting the piece was likely mounted during an earlier phase of curation. Some of the breakage look fresher to this surface and some of the damage may have been caused during the removal of the piece from its mount. No signs of decoration to this surface.

Box 329 AO1

Medial fragment of a biserially barbed point, with asymmetrical barbs, four to one side, two to the other. The tip has broken in what may be a recent break with some of the bone being yellow in colour. The proximal end has also broken but the break is old based on colour. Some cracking is evident and part of the point look to have been repaired. The colouration of the bone in the break suggests this is a recent break and refit. The colour of the bone is brown/grey and fresh antler is a more vibrant yellow. The barbs look to have been produced by cutting out a wedge of bone from the back of each barb from each side, giving a triangular shape and deep diagonal cut marks in the spaces between barbs. The more spaced barbs look different and are more lozenge shaped, with the bone worked and lowered all the way around each barb to leave the protruding barb. There are no signs of any decoration to the surface. The reverse surface shows evidence of disruption across its surface, likely from the removal of the outer surface of bone when this piece has been removed from its mount. That the piece was mounted is further evidenced by the presence of red felt and glue in some places, also associated with removal of the piece from its mount. The mode of working can be confirmed to both sets of barbs. The raw material can be confirmed as antler with spongy bone exposed to the reverse surface. Some working marks do suggest a more diamond shape for the more frequent barbs, the working of the front side to shape and give definition to the barb, and likely hone it to a sharper point.

Box 329 AO2

Medial fragment of a barbed point, broken to both ends. The piece is light brown/grey in colour. One break is similar in colour and looks to be old (tip end), the other has a fresher, yellow colour and is likely recent. Given the piece is a fragment the piece is a fragment can't be attributed as uni or bi-serial with complete confidence. However, it is probable the piece is uniserial as there is little in the way of residual working traces to the opposing side to suggest otherwise. Only one barb remains and it is large and slightly curving. A deep wedge has been cut from the back of the barb to leave a clearly protruding barb, narrowing the inner shaft of the point by working the barb in this way. There are signs of shaping to the front and sides of the barb. To give the barb definition and hone it to a point. There are no signs of any heating, ochre etc. to this surface. No signs of any decoration to this surface. The reverse is composed of spongy bone, confirming the piece is made from antler. The nature of working the barb is confirmed to this surface. The age of the breaks is also confirmed. The piece shows evidence of having previously been mounted with patches of red felt and glue present. The removal from the display mounting is the likely cause of the recent break to the proximal end. No signs of any decoration to this surface.

Box 329 AO3

Distal tip of uniserial barbed point, grey/yellow in colour and broken from the rest of the piece. This piece looks to have been worked in much the same way as AO2 above with a deep wedge removed from the back of the barb and shaping of the other sides to leave a curving, pointed projection of bone. Part of the barb is broken and both this and the break across the shaft look to be recent based on colour. The piece has been removed from a mount, with red felt and glue present, and this removal has likely caused the damage. The piece gently tapers along its length to give a narrow point as the tip of the piece. No sign of any heating, ochre etc. to this surface. No sign of any decoration. Spongy bone is evident to this side suggesting the raw material is antler. The method of working can be confirmed to the obverse surface. Working traces can be seen for the next barb in the sequence, disrupted by the break. There are no traces of decoration to the surface. No signs of any heating, ochre etc. to the surface. The cutting out of wedges to form the barb has been from both sides to give a triangular shape to the barb.

Box 329 AO4

Yellow/brown uniserial barbed point made from antler. The end of the piece is rounded rather than fully point like and two points are evident. The proximal end is narrower and

displays an ancient break based on colour. There is a series of diagonal lines that are likely associated with friction grip for the piece. Some fine working lines are evident to the barbs where the shape was marked out before cutting. The barbs have been shaped and wedges cut from the back giving a fairly triangular shape. There is variance between the barbs with the distal being more prominent and realized than the proximal. There is a recent lateral break running through the shaft of the piece which has been repaired. Some lateral striations suggestive of smoothing and shaping. The reverse has spongy bone confirming this is antler. Confirmation to method of barb production to this side. The piece has localised patches of red felt and glue associated with an earlier mounting of the piece. Localised yellow bone are likely damage caused by this removal.

Box 329 AO5

Possible fragment of barbed point, perhaps unfinished. The piece is brown/yellow in colour. There is a break to the proximal end, a more vibrant yellow in colour, suggesting the piece is broken recently. Thinning to one edge to give what might be a very large barb, though not completely realized. The end of the piece is angular with a cut. Is this really a (barbed?) point? No sign of any heating, ochre etc. to the surface. No signs of any decoration to the surface. The reverse shows heavy traces of red felt and glue from an earlier mounting of the piece and some yellower patches of bone where the surface has been damaged and removed by the glue. If not some form of point, the function of the piece is unknown.

Box 329 AO6

Biserially asymmetrical barbed point broken to both ends. The breaks are covered with sediment to both ends suggesting they are old. One side has four barbs while the other side has a single barb. Deep lines have been engraved along the length of the piece to leave a raised central bar of bone. A deep groove has also been engraved along the middle of the solitary barb. These lines may constitute decorations or they may be linked to function. The barbs have been shaped to all sides and wedges cut out from the back to form the barb, leaving a slightly raised margin of bone at the mid line between barbs. There are traces of a deep brown sediment across the piece and within grooves. No sign of any heating, ochre etc. across the piece. Some lateral scratches and striations look to be working traces. Some of the barbs are flat and could be broken – they may have been flattened as part of production to narrow the profile of the piece. Spongy bone is evident to the reverse and

this suggests the raw material is antler. Confirmation of method of working to this surface for the barbs. There are heavy traces of red felt and glue to the surface suggesting the piece was mounted during an earlier phase of curation. Some localised yellow patches of bone suggest the piece has been damaged during removal. Extensive traces of brown sediment caught within the spongy pores of the bone. No signs of any decoration. No sign of any heating, ochre etc. across the surface. The barbs do look to have been cut and shaped to narrow the profile to both sides.

Box 329 AO7

Fragment of point, yellow in colour, rounded to square in cross-section and with a modern break to one end based on colour, a more vibrant yellow in colour. No obvious traces of any sediment, heating, ochre etc. across the surface. No sign of any decoration to the surface. The piece looks thinned to the end but not fully beveled. The reverse is spongy bone suggesting the piece is antler. The break looks to be recent, fresh bone yellow in colour. There are traces of glue to the reverse suggesting the piece was mounted and has been damaged during its removal. The piece is rounded to rectangular in profile. No signs of any heating, ochre, etc. across the surface. No sign of any decoration across the surface. This is the distal end and the tip has been broken off.

Box 329 AO8

Medial fragment of uniserial barbed point, yellow/grey in colour. Both breaks look to be old based on colour. The raw material looks to be older. Three barbs are present, closely spaced, and wedges cut to the back to separate the barbs. There are some lines present on the barbs, likely associated with their working. The reverse of the piece has some red felt and glue to the surface suggesting the piece has been at some stage mounted and then subsequently removed from its mount. Some fire cracks are present across the surface and look to be old based on colour. No signs of any heating, ochre, decoration etc. across the surface.

Box 329 AO9

Medial fragment of uniserial barbed point light brown in colour and broken to both ends. The break looks to be old based on colour. The reverse is spongy bone and has traces of red felt and glue suggesting the piece was likely mounted and has been later removed from this mount. Four barbs are present to one side and the other side has no barbs. The barbs look

small and have been shaped to all sides. They are closely spaced and a small wedge has been cut to separate each barb to the back of each. Some lines running longitudinally along the piece look to be associated with the working of the piece and perhaps marking out the piece for cutting the barbs. No signs of any heating, ochre, decoration etc. across the piece. The barbs are small and closely spaced.

Box 329 AO10

Tip of a barbed point, brown/yellow in colour. The piece is broken and this is likely an old break based on colour. The piece has a single, small barb to one side. It is unknown whether the piece was uni or biserial based only in the small piece preserved. Some lighter patches of bone, especially to the end of the barb, look to be localised patches of more recent damage. There are some occasional dark patches across the surface and this is likely sediment. No signs of any heating, ochre etc. across the surface. No signs of any decoration across the surface. The length of the tip is relatively short. This may have been re-sharpened over the object's life history. The reverse has some spongy bone, suggesting the piece is made of antler. No sign of any glue or felt to the piece.

Box 329 AO11

Small fragment of barb from a barbed point. The colour is deep brown in colour and the reverse has a yellower colouration from a recent break. The piece has two deep grooves running across the obverse surface, similar to that seen on AO5. This could be decorative but may be functional. The barb is large and the underside/back of the barb shows evidence for wedges having been cut to produce the barb. Working occurred from both sides to remove the wedges. No sign of any heating, ochre etc. across the surface. Traces of brown sediment across the piece. No decoration to the reverse. No sign of heating, ochre etc. to the reverse.

Box 329 AO12

Small fragment of a small, fine barbed point, the tip and proximal end of which are broken. The tip looks to be a recent break based on the more vibrant yellow colouration while the proximal end looks to be an old break based on colour. The cross-section of the piece is ovoid. There is a small barb to one side, perhaps better described as a notch, worked to all sides to leave a small, localised raised area. There are no signs of any heating, ochre etc.

across the surface. Some spongy bone evident to the reverse confirming the raw material is antler. No signs of any decoration to this surface.

Box 329 AO13

Small barb with recent break, deep brown in colour. The reverse has a spongy bone exposed suggesting it is made of antler and the colour of the back is a more vibrant yellow suggesting a more recent break. The nature of the barb is very similar to AO10. This piece also has a deep groove running along its length. Deep brown sediment is present within the groove. This piece would likely project further out from the shaft than would piece AO10. No signs of any heating, ochre etc. across the surface. The break looks to be recent based on colour. No clear working traces are present to the back of the barb.

Box 329 AO14

Proximal fragment of a likely barbed point, broken to both ends, light brown in colour. There are some fine longitudinal striations running along the length of the piece, likely associated with working and shaping the piece. The base of the piece looks to have been broken recently being vibrant yellow in colour. The distal end looks to be similarly broken recently, also yellow in colour. Two rounded 'toggles' have been carved towards the base of the point. These are roughly similar in size, shape and position. They are rounded and fairly symmetrical, suggesting they are not barbs. Instead they may have been used for attaching a line to the piece, suggesting this piece was a harpoon. No trace of decoration across the surface. No signs of any heating, ochre etc. across the surface. The piece is rounded but fairly angular, the planes of cutting quite evident to give a raised ridge of bone to the midline of the piece. There are two possible longitudinal grooves running along the piece. These are disrupted by the break and are difficult to quantify as the area looks to be damaged somewhat, being lighter in colour and some small holes in places. Spongy bone to the reverse confirms the piece antler. no signs of heating, ochre, decoration etc. across the piece.

Box 329 AO15

Small barb from a barbed point, light brown in colour. The break to the piece looks to be old based on colour. Some fine striations are present across the surface. Likely associated with working. There are signs of shaping to all sides and the back of the barb has been separated from the shaft by cutting wedges from the back of the piece from both

directions. This has left a small triangular piece of antler to the base of the back of the barb. No signs of any heating, ochre etc. across the surface. No signs of any decoration across the surface. The raw material is likely antler. The broader morphology of the barbed point can't be discerned from the barb. The reverse similarly displays a number of deeper striations running longitudinally along the length of the piece (here referring to the complete piece), associated with working and shaping the piece. No signs of any heating, ochre etc. to the surface.

Box 329 AO16

Fragment of an uncompleted barb, light yellow in colour. The piece has been subject to modern breakage with some surfaces showing a more vibrant yellow coloration. The piece has been cut and shaped to its outer edge (the 'front' of the barb). The back of the barb doesn't look to have been separated from the shaft. A deep groove looks to demarcate the shape of the final groove and this is likely a prerequisite to cutting wedges from the back of the barb to remove it from the main shaft. This would lend support to the notion that barbed points are being produced at the site. There are no signs of any heating, ochre etc. across the piece. No signs of any decoration across the piece. Alternately, the line running down the centre could be (and is more likely) decoration, as seen on some of the other pieces, and the entire piece is a larger, cruder point. The tip and the base are broken and these both seem to be recent based on colour. Confirmation of the latter interpretation, the back of the barb has the characteristic striations from the removal of wedges and a small triangular protrusion of bone where the wedges haven't removed all of the bone. No signs of any heating, ochre etc. across the reverse. A single groove runs through the piece not from production.

Box 329 AO17

Short double beveled point, light yellow/brown in colour and with some patches of dark sediment within natural longitudinal cracks. There is a red/pink hue to parts of the bevel. This could be sediment or perhaps even red ochre. The bevel is long in comparison to the shaft and point. The point is crudely and abruptly worked giving a shape similar to a pencil. There are some variable striations to the bevel. They are not the typical deep, diagonal grooves associated with a friction grip but are shallower, running deeper towards the base of the bevel and are at a shallower angle than is typical. The tip of the piece looks to have possibly broken. The break would be old based on colour. However, this could be a cut and

part of the crude shaping of the piece. There are some lighter yellow patches across the piece and this is likely recent damage. There are some longitudinal striations and possible grooves running along the length of the piece. The finer striations are likely associated with working and shaping the piece. The deeper grooves may also reflect this process though they could potentially be decorative, perhaps supported by the change in orientation. The possible ochre looks more like sediment under the microscope, though this is suspicious due to the presence of brown sediment – ochre! Spongy bone is present to the reverse, perhaps suggesting the piece has been made from antler, perhaps a tine given its short length. A long bevel has been cut, similar in length to the obverse. There are no grooves to create a friction grip. Red felt and glue are present suggesting the piece has been mounted during an earlier phase of curation. A localised vibrant yellow patch of bone suggests some bone has been lost during this removal, the colour indicative of modern damage. The edges are fairly angular giving the piece a sub-rounded square shaped cross-section.

Box 329 AO18

Small, double beveled point, light grey/yellow in colour. There are two localised patches of vibrant yellow bone and this is likely damage from when the bone was removed from the mount during an earlier phase of curation. There is a small, localised patch of glue which supports this. The surface of the antler looks to be eroded, obscuring some of the detail of the piece. Several heavily eroded grooves across the bevel may be associated with a friction grip but they run longitudinally. Some deep grooves/cracks run longitudinally up the length of the piece. Finer but more clear grooves have been made to both side edges, two groups to one edge, one group to another. They run diagonally in groups of 5, 5 and 4 respectively. The morphology of the piece narrows at the mid point and the grooves seem to be associated with the narrower portions of the shaft. The tip has been worked down to a small and thin point, leaving a clear step between the main shaft and the tip. This particular shape likely links to its function (note similarity in morphology to AO16) but it is conceivable this is in part a result of re-sharpening of the piece. The edges are slightly angular and this piece would have a sub-angular roughly square to rectangular cross section. No sign of any heating, ochre etc. across the surface. Could the narrowness in the mid-point of the shaft be for attaching a line? Some spongy bone present to the reverse suggesting the piece is antler. There are a number of deep, diagonal, parallel lines running across the bevel and these are likely designed to act as a friction grip. A single longitudinal

groove looks to run down the length of the piece off centre. This doesn't seem to serve a discernable function. No sign of any heating, ochre etc. across the surface.

Box 329 AO19

Fragment of a point, deep brown in colour and broken at both ends. The breaks look to be recent based on either vibrant yellow colour. An additional break has also been repaired by glue and this too is likely a modern break. Some fine striations running longitudinally along the piece look to be traces of working and smoothing the piece. There are two deep grooves running down the length of the piece. One of these is slightly curving and cuts over onto the edge. The other is straighter and runs down the length of the piece. This has in turn been embellished by regularly and tightly spaced notched at 90 degrees to the original cut forming a notched design. This design looks similar to a rope design. These lines don't seem to serve any immediately obvious function. No signs of any heating, ochre etc. across the surface. No signs of any other decoration to the surface. Some very pink/orange patches may be sediment or possibly ochre. An additional groove is present to the top edge and is similar to the curving groove previously described. Could these be removals for points? The top edge actually looks to be an old break when observed from the reverse surface. The upper edge is quite angular suggesting the piece has been cut. The reverse surface is smoothed spongy bone. Could the piece be a small baguette demi-ronde? Confirmation of the repair of the break. The piece has previously been mounted and prominent traces of red felt and glue remain. The recent break was likely caused by this removal from the mount. There are a series of relatively deep diagonal grooves evenly spaced across the entire piece. They may be decorative or conceivably part of a friction grip if the piece is a baguette demi-ronde. No other signs of heating ochre decoration etc. across the surface.

Box 329 AO20

Fragment of a point likely made of antler, brown/yellow in colour. Spongy bone is evident across the bone and this looks to have been subject to smoothing. A break runs through the middle of the piece and this was likely caused during the removal of the piece from a mount during an earlier phase of curation. This is supported by the presence of glue and red felt across the surface. Yellow patches of bone suggest some additional damage during removal including the break to the tip. No signs of any heating, ochre etc. across the surface. The obverse surface has a longitudinal groove running along its length, joined by

several others at the mid-point that seem to merge into one groove with finer internal marks that show which line is which. Not able to attribute this to a function. No sign of any heating, ochre etc. across the surface.

Box 329 AO21

Medial fragment of a point, deep brown in colour and small in size. The proximal end has sustained an old break based on colour, the distal end has sustained a new break based on colour. There are some localised lighter yellow marks which look to be recent damage. The cross-section of the piece is quite angular and square in shape. On different sides there are variously seems to be longitudinal grooves running down the length of the piece or a central bar of bone left raised with both sides reduced and worked. No clear functional reason for such a pattern. No sign of any ochre, heating etc. across the surface. The raw material is likely antler. Where bone is present it has been smoothed down. The reverse surface shows signs of the piece having been mounted during an earlier phase of curation with traces of glue and red ochre across the surface. No signs of any heating, ochre etc. across the surface.

Box 329 AO22

Fragment of a point, yellow/grey in colour and broken to both ends. A break to the mid-point has been repaired and is likely recent. There are some longitudinal cracks running through the piece. One break looks to be old based on colour while the other looks recent based on colour. The raw material is likely antler. The surface has been heavily disrupted by glue and red felt suggesting the piece has been removed by an earlier mounting. Vibrant yellow patches demarcate here bone has been lost during this removal. No signs of any heating, ochre etc. across the surface. The cross-section of the piece is sub-angular and roughly square to rectangular in shape. No signs of any decoration to the surface. Spongy bone is present to the reverse surface, perhaps confirming that the piece is antler. No sign of any decoration to the piece. The cracks running through the piece are likely associated with the recent breakage.

Box 329 AO23

Medial fragment of point, similar in size and shape to AO21. The colour is light brown/yellow. The breaks to either end looks to be old based on colour. A break runs through 2/3 along the length of the piece. This looks recent based on colour. There is a

possible single groove running down the length of the piece, though it looks worn. There is no discernable function associated with this line. No sign of any heating, ochre etc. There cross-section of the piece is roughly square to rectangular as the edges have been left quite angular. Spongy bone is present to the reverse, likely confirming this piece is antler. Yellow patches suggest some localised and recent disturbance to this surface. This is confirmed by the presence of glue and red felt to the surface suggesting the piece has been removed from a mount with some associated disruption. The break running through the piece was likely caused during this event. No signs of any heating, ochre etc. across the surface.

Box 329 AO24

Large distal end of a point, yellow/white in colour, with breakage to the proximal end. The piece is likely made from an antler tine. The piece may actually be a wider or gauge based on the steep and wide end relative to the morphology of the rest of the piece. There are some fine longitudinal striations running along the length of the piece likely associated with working and shaping the piece. No sign of decoration across the piece. No sign of any heating, ochre etc. across the piece. The piece looks heavily worn possibly broken to the working end, likely based on colour. The proximal end is broken and looks old based on colour. Some fine longitudinal cracking looks to be natural. The cross section is roughly round though the reverse of the piece has been shaped flat. The tip looks to have some localised modern breakage based on colour with vibrant yellow patches. Spongy bone is present to the reverse surface confirming the piece is likely antler. Localised patches of damage are evident, more vibrant yellow in colour and with localised patches of red felt and glue. This suggests the piece was likely mounted during an earlier phase of curation and this likely accounts for the modern damage.

Box 329 AO25

Fragment of a double bevel ended point, yellow/brown in colour. The break looks old based on colour, though it could be modern as there are traces of glue and red felt to the reverse of the piece. These traces suggest the piece has been mounted in an earlier phase of curation and likely some damage has been caused during removal (yellow patches of bone). Spongy bone is evident suggesting the raw material is likely antler. A series of grooves running diagonally and parallel across the bevel are associated with a friction grip rather than decoration. To the obverse, some longitudinal striations are present to the edges and to the bevel, indicative of smoothing and shaping. A series of grooves have been

cut diagonally across the bevel and these are associated with a friction grip. These grooves cut through the previously described striations, supporting the view that these are working traces. This series of grooves seem to run up the length of the shaft and may transition into something decorative. A design seems to present to one edge. This seems to consist of a longitudinal groove cut by a number of shorter grooves running diagonally that cut through it. The break looks to be old based on colour. No signs of any heating, ochre etc. across the surface. No functional explanation for the design to the edge – this is likely decoration. Some traces of taphonomic manganese.

Box 329 AO26

Large fragment of a double beveled piece, light brown in colour. The break to the end looks to be recent based on colour, more vibrant yellow in colour. The bevels are short and gentle and have also been cut at the edges to narrow the bevel laterally. There are some longitudinal striations to the piece and this is suggestive of working and shaping of the piece. There are some light grooves running across the bevel at a shallow and diagonal angle. These are at a different angle to the working traces suggesting these grooves are likely part of a friction grip. These grooves look to have been produced by the side of the tool rather than by a direct cutting motion to give a deep groove as seen in many of the other pieces. No signs of any heating, ochre etc. across the piece. Both edges have a deep groove running laterally at the id-point of each edge surface. These are disrupted by the break to one side but is complete to the other. To the other side with the disrupted groove towards the bevel. A series of groups of diagonals are present. The following group runs in opposite orientation to the former to give a zig-zag pattern, though each groove, does not directly connect to the other. These features don't seem to be associated with the function of the piece, especially as the sides are asymmetrical. These features are more likely decorative. The raw material is likely antler. There are some patches of sediment across the surface, light brown in colour. The reverse of the piece has spongy bone and this perhaps supports the attribution of this piece as antler. Localised patches of bone look to be disrupted and more vibrant yellow in colour. Some localised traces are also present. This suggests the piece has likely been mounted during an earlier phase of curation and has been damaged during its removal. No signs of any heating, ochre etc. across the surface. There are some fine diagonal striations running across the bevel and this could be working traces and/or very fine addition of grooves to add a friction grip.

Box 329 AO27

Fragment of double bevel ended point made from antler, light grey in colour with natural longitudinal cracking. There are some localised traces of sediment, light to deep brown in colour. There looks to be breakage to both the shaft and the bevel end. All breaks look to be old based on colour. No signs of any heating, ochre etc. across the surface. No signs of any grooving, or decoration, including to the bevels. No decoration, heating, ochre etc. to the reverse. The reverse has some traces of red felt and glue suggesting the piece was mounted during an earlier phase of curation. The lighter patches of bone suggest some localised damage as a result of the piece from its mount. There is a recent break to the bevel and this is likely associated with removal of the piece from its mount. The original surface has some fine diagonal lines and this may be indicative of a friction grip.

Box 329 AO28

Long fragment of double beveled point, light brown/grey in colour. The piece has a break running through the piece has been repaired with glue present at the join. Both ends look to be broken and these breaks look to be recent based on the more vibrant yellow colour. There are some longitudinal striations running down the length of the piece, likely associated with the working and shaping of the piece. The bevel has a number of diagonal grooves running along the piece in parallel. These lines were likely designed to produce a friction grip. The cross section of the piece is sub-rounded and rectangular with the edges rounded but somewhat angular from shaping the piece. No signs of heating, ochre etc. across the surface. No signs of any decoration across the surface. The reverse surface is heavily disrupted by disruption to the surface. The surface has localised patches of red felt and glue to the surface suggesting the piece has been mounted during an earlier phase of curation. The more vibrant yellow colouration of some of the bone is likely damage from the removal of the bone from its haft. The break may also be associated with this removal. The disruption to the surface makes it difficult to see grooves and similar features. The piece is thin and it may have only the single bevel. Indeed, this may not be a bevel strictly defined but the friction grip grooves have been added regardless.

Box 329 AO29

Fragment of double bevel ended piece, light yellow brown in colour and with a break to the end, likely old based on colour. The piece is likely made from antler. Some fine lateral parallel grooves are present to the bevel and these grooves likely form a friction grip.

However, this zone is heavily disrupted and these features are not at all clear. Possibly this is just damage. No signs of any heating, ochre etc to the piece. The cross section of the piece would be round to elliptical with well rounded edges. Some localised darker patches may be manganese. The bevel to the reverse is more steep and obvious than the bevel to the obverse. Some spongy bone evident to the reverse, suggesting the piece is likely antler. The piece has heavy traces of red felt and glue across the surface. This suggests the piece was mounted during an earlier phase of curation. There are large patches of yellow bone across the surface which is likely from damage associated with removal of the piece from its mount. The break is likely old based on colour. There are no signs of any grooves to form a friction grip which may suggest the obverse also has no grooving. No signs of any heating, ochre etc. across the surface. No signs of any decoration across the surface.

Box 329 AO30

Fragment of a double bevel ended point with breaks to the shaft and the bevel. The piece is light brown in colour and is likely made from antler. The breaks to the shaft looks old based on colour while the break to the bevel looks more recent with a more vibrant yellow colouration. The piece has a sub angular cross-section and rounded to square in shape. The edges are quite angular and the piece narrows somewhat towards the bevels. A series of fine parallel lines have been engraved along the shaft. These don't look to be associated with any functional consideration of the object. Some fine longitudinal striations are present across the piece and this is likely associated with working and shaping the piece. A deep groove has been cut along one edge and this may again be decorative. It is disrupted by the break and looks to have a localised trace of red ochre associated with it. This isn't matched to the other side which is blank. Spongy bone is present to the reverse of the piece and this suggests the piece is likely antler. There are traces of red felt and glue across the surface and this suggests the piece has been mounted at some point during an earlier phase of curation. Some localised patches of bone, more vibrant yellow in colour, are likely recent damage associated with removal of the piece from its mount. No signs of heating, ochre etc. to this surface.

Box 329 AO31

Fragment of a double bevel ended point, broken across the shaft and light brown in colour. There are traces of sediment across the surface and this is deep brown in colour. The break looks to be old based on colour. A small fragment looks to have been broken from this

break and looks recent based on colour. One edge has a groove running laterally along its length, disrupted by the break. This is not matched to the other side. This may be linked to an (unknown) function or it may be decorative. No signs of any grooving to the bevel. No signs of any grooving to the bevel. No signs of any heating, ochre etc. across the surface. The reverse has spongy bone exposed and this supports the interpretation as ochre. At least some of the breakage to the bevel and the shaft looks to be recent based on colour. Traces of red felt and glue are present across the reverse and this suggests the piece was mounted during an earlier phase of curation. Some localised yellow patches suggest some bone was removed during removal from the mount. The piece has modern breaks and these may well have been caused of removing the piece from its mount.

Box 329 AO32

Fragment of a bevel ended piece yellow/brown in colour, only the bevel remains, the rest of the piece is missing due to breakage. Based on colour, the piece likely broke in antiquity. Given the location of the break, it is possible the piece broke during use. No signs of any heating, ochre etc. No signs of any decoration. Diagonal grooves run across the bevel and these are fairly shallow and roughly parallel. These grooves likely were used to form a friction grip for the piece. Some localised darker patches may be sediment and/or manganese. The broader design of the piece cannot be discerned. Spongy bone is present to the reverse perhaps suggesting the piece is antler. The piece seems to be slightly concave to the reverse. Red felt and some glue is present suggesting the piece has been removed from its mount during an earlier phase of curation and display. No sign of any heating, ochre, decoration etc. to this surface. Some bone may have been lost during the removal of the piece from its mount. Confirmation of the age of the break to this surface.

Box 329 AO33

Fragment of a double beveled point, likely made from antler. The piece is brown/yellow in colour. The break looks to be old based on colour and none of the shaft remains. The piece may perhaps have broken as a result of use. No sign of any heating, ochre etc. across the surface. There is no decoration and no sign of any grooves to form a friction grip. Spongy bone is present to the reverse perhaps supporting the interpretation of antler. There is no sign of a friction grip to this surface. Red felt and glue is present across the surface and this is likely residual damage from an earlier mounting of the piece. Little sign of any associated loss of bone.

Box 329 AO34

Fragment of a point. Deep brown in colour with some localised yellow patches. Both ends look to be broken, one end looks recent based on colour and the other looks recent based on its more vibrant yellow colour. The piece is likely composed of antler. There is a small fragment of glue but no red felt. Alongside some yellow patches of bone and a recent break, this may suggest the piece has been damaged during removal from haft from an earlier phase of curation. No signs of any heating, ochre etc. across the surface. No signs of any decoration. The cross-section of the piece would be rectangular – it has very angular edges. The reverse is similarly dark brown in colour but with some localised yellower bone. The break does look old based on colour, though with some localised yellow bone. The other end of the piece also looks to have a small break and this is likely old based on colour. No sign of any heating, ochre etc. across the piece. No sign of any decoration across the piece.

Box 329 AO35

Fragment of a double beveled point broken across the shaft, light brown in colour. There are some deeper patches of dark sediment across the surface. The piece is broken across the shaft and this looks to be recent based on the colour of the break. Grooves are present across the bevel and these run diagonally across the piece. These likely form a friction grip. The piece may also have been subject to a repair that has subsequently broken, with residue of glue across the break. Spongy bone is present across the surface suggesting the piece is likely antler. No signs of any heating, ochre etc. across the surface. No sign of any decoration across the surface. The reverse also has a number of diagonal grooves running across the bevel and these were likely part of a friction grip. Breaks to the end of the bevel look to be old based on colour. No signs of any heating, ochre etc. across the surface. No signs of any decoration across the surface. The broader morphology of the piece can't be discerned from the bevel alone.

Box 329 AO36

Fragment of a double bevel ended point broken across the shaft. The piece is deep brown/yellow in colour. The break across the shaft looks to be old based on colour. Given the position of the break, this piece may have broken in use. There are traces of glue across the surface and this suggests the piece was likely mounted during an earlier phase of

curation. Some localised yellow patches of bone may be damage associated with this removal. A groove runs laterally across the edge of the piece, disrupted by the break. There is no immediately obvious functional reason for this. This is not matched to the other side. There are some barely visible diagonal grooves which run across the piece and these were likely used to form a friction grip for the broader piece. The reverse similarly has a series of more obvious grooves running across the piece, and again running diagonally, likely to produce a friction grip for the piece. No signs of any heating, ochre etc. across the piece. No signs of any decoration beyond that already described.

Box 329 AO37

Fragment of a double beveled piece, broken across the shaft. The piece is deep brown in colour. The break across the shaft looks old based on colour the piece has two groups of grooves across the bevel that are short, diagonal and run to the edge, drawn from the middle outwards. This is likely to create a friction grip but it is interesting that the style of execution is different in this example. No sign of any decoration to the piece. No signs of any heating, ochre etc. to the piece. The piece is relatively well rounded in cross section with only slightly angular edges. There are four grooves to each side and these almost look like matched pairs. The broader morphology of the piece is likely that of a point. The reverse shows spongy bone perhaps suggesting the piece is antler. The bevel to this side displays the more typical diagonal groove across the piece. These look more carefully worked than on some other piece. The contrast between then obverse and reverse is interesting and unique amongst the beveled pieces. The surface has traces of red felt and glue across the surface and this suggests the piece has been mounted during an earlier phase of curation. Some more vibrant yellow patches of bone are likely damage associated with the removal of the piece from its mount. The break is confirmed as old to this surface. No signs of heating, ochre etc. across the piece. No signs of any decoration.

Box 332 AO1

[note, this fragment refits to Box 332 Ao28 – see initial images of this piece] Distal fragment of a biserially barbed point, yellow/light brown in colour. A break is present to the surface of the piece and this is old based on colour. A break runs through the piece but this looks to have been refitted and repaired. The piece is likely made from antler. There is some patches of adhering sediment, orange/light brown in colour, and this accounts for much of the darker coloration to the piece. The tip is thin in depth but relatively rounded

and broad. The piece has two barbs to one side and a single barb to the other, broken to the tip. Each barb has a groove running from base to tip and no function can be discerned for these. Possibly decorative. The piece has two longitudinal groove running down its length and again these seem to serve no immediate obvious function. The barbs are large and steeply curve back and converge to a sharp point. Each side of the barb has been worked to shape and thinned. The back of the barb has been separated from the shaft by cutting wedges from both sides of the piece. Some small fragments of bone remain from this process at the very base of the back of the barb where it meets the shaft. Taken in light of its refitting to piece [Box 332 AO28] this piece is a harpoon. The piece is heavily corroded across the surface and this disrupts some of the detail of the piece. No signs of any additional decoration. No signs of any heating, ochre etc. across the piece. The breaks to the barb look to be old based on colour. The refit of the piece is recent but it isn't obvious if the pieces were broken in antiquity. Spongy bone is exposed to the reverse supporting the view that the piece is antler. Some very localised red patches within voids in the bone, possibly localised patches of red ochre. The breaks across the shaft both look to be old based on colour. The barbs also have the same groove running down the middle. Some localised yellow patches of bone suggest recent damage but there is no broader suggestion of the piece having been mounted. No other signs of heating, ochre etc. No other signs of decoration across the surface. The barbs look to be slightly asymmetrical with those to the left positioned slightly lower down the shaft.

Box 332 AO2

Distal fragment of an asymmetrical biserial barbed point, light brown to dark yellow in colour. The piece is broken across the shaft and this looks to be recent based on the more vibrant yellow colour. An additional small fragment has been refitted to the break and this also looks to be recent. Each of the breaks, two to both sides, look to have broken and/or have modern refits and repairs. The presence of vibrant yellow bone in each case suggests each of these breaks is recent. The tip of the piece is longer which may imply the piece has seen less use and curation than those pieces with shorter tips. Some darker traces across the surface is likely post-depositional manganese. The barbs are relatively long and slightly curving, shaped and separated from the shaft by removing wedges from both directions. The barbs and shaft look to have additional details, perhaps engraved with the side of a tool given the presence of striations within the shallow grooves. These run down the length of the barbs and up the length of the shaft. There is no clear functional reason for this. The

barbs look to have been made by cutting wedges from the back of the piece and the other sides shaped to give the shape of the barb. Some of the bone is yellow in colour to the reverse and with some translucent areas which is likely suggestive of glue and that the piece was likely mounted and removed from its mount at an earlier phase of curation. The same grooves are present to the barbs to the reverse but there is no broader decoration to the shaft. No signs of any heating, ochre etc. to the reverse. The recent break may be associated with the removal of the piece from its mount. There are several notches to either side of the piece towards the proximal end (tip). These are localised to the edges and don't seem to serve any clear function. These may be part of the decoration.

Box 332 A03

Fragment of a biserial barbed point light yellow/brown in colour with a break to the proximal end of the shaft. The tip is very short, thin and relatively broad. It comes down almost immediately to barbs on both sides, two to each side. This may suggest the tip has been reworked to form a new tip. The barbs are relatively short and are positioned tightly to the shaft. All of the barbs are broken and the breaks look to be recent based on colour. The break to the shaft looks to be old based on colour. The barbs don't look to have been extensively worked to thin them, though they have been shaped. Wedges have been removed from the back of the barb from both sides. Chop marks can be seen that suggests multiple wedges were cut between the barbs to give the back of the former and the front of the latter. Each barb has a groove running down its length and an additional short groove oriented with the main shaft of the piece. These don't seem to serve a discernable function. There are some localised orange/red patches across the piece. This could be sediment or perhaps even red ochre. This is especially evident between barbs to the edges. The shaft looks to have some finer yellow patches of the bone that suggests some recent damage. No signs of any other traces of heating, ochre etc. or of other decoration. The raw material is likely antler. The very tip of the piece looks to be damaged, more vibrant yellow in colour. The reverse displays smoothed spongy bone and this supports the view that the piece is antler. There are some more vibrant yellow patches which may suggest some localised damage. There are very small traces of glue and perhaps red felt and this suggests the piece was likely mounted and damaged during removal from its mount. No signs of any heating, ochre etc. across the surface. No signs of any decoration to the surface, including to the barbs.

Box 332 AO4

Tip of a fragment of biserially barbed harpoon made from antler and yellow in colour. The piece is broken across the shaft and the break looks to be recent based on its more vibrant yellow colour. The tip is thin, wide but narrows to a fine point. The barbs, one to either side, have been extensively thin and are wide and long with a wide separation from the shaft. The cross section is rounded but somewhat triangular which may be associated with thinning the barbs. No signs of any heating, ochre etc. across the piece. One barb looks to be broken while the antler is complete. The complete example has some fine incisions which run from the middle of the barb to the edge. This doesn't seem to be associated with working or function and so could be decoration. There are some traces of deep brown sediment across the surface. There are some longitudinal striations along the length of the piece and this is likely associated with the working of the piece. The tip is short and it could be the case that the tip has been reworked and shortened as a result. Some spongy bone present to the centre of the shaft and this supports the position that the piece is made from antler. The barbs look to have been separated from the shaft by cutting wedges from both directions from the back of the barb. Not entirely clear if the barb broke recently or in antiquity. Based on the position of the barbs, the piece is likely symmetrical. To the reverse, no signs of decoration across the surface. No signs of any heating, ochre etc. across the surface. Traces of sediments also present within the base of the barbs to this surface. Some localised vibrant yellow bones looks to be damage associated with the likely mounting of the piece during an earlier phase of curation. The recent break may also be associated with the removal of the piece from its mount.

Box 332 AO5

Distal fragment (tip) of a likely uniserial barbed point, broken across the shaft. The piece is light brown in colour. The break across the shaft is a more vibrant yellow in colour and this suggests the break is recent. The piece is thick and the tip is short. This may suggest the tip has been subject to reworking. Two lateral grooves have been cut above the barb and a short longitudinal groove has been cut to the other side where the barb might be positioned if it were a biserial piece. The barb is slender and relatively large and has been separated from the shaft by cutting wedges from the back of the piece. This working looks to have been from two directions. The tip of the barb is broken and this looks to be recent based on colour. No signs of any heating, ochre etc. across the surface. The raw material is likely antler. The reverse of the piece looks to be composed of spongy bone suggesting the

piece is likely antler. The colour is a more vibrant yellow and this suggests the surface has suffered recent damage. There are no traces of red felt or glue so it is not immediately clear if the piece has been damaged during the removal from a mount. However, given the broader pattern of damage observed across other objects this is perhaps likely. No sign of any heating, ochre etc. to this surface. No sign of any decoration across the piece.

Box 332 AO6

Distal fragment of a biserial barbed point with a repaired break and additional break to the shaft. The colour is yellow to light brown. The repair is recent and the break across the shaft looks to be old based on colour. The tip is thin and wide, the barbs fairly large and somewhat asymmetrical. The darker patches of colouration to the surface are likely traces of post-depositional manganese. There are three barbs to each side of the piece. Many of the tips of the barbs are broken and these breaks look to be old based on colour. There are some traces of sediment to the back of the barbs in the meeting point of the bottom of the barb and the shaft. A groove has been drawn longitudinally down the length of the shaft at the join between the shaft and the barb. These marks seem to serve no obvious function and are likely decorative. Each barb has a groove running down the length of the barb and again this doesn't seem to be functional. One barb doesn't display either of these (top left barb). No signs of any other decoration across the surface. No signs of any heating, ochre etc. across the surface. The barbs have been gently narrowed and shaped to all sides and wedges cut to the back of the piece to separate the barb from the shaft. This working was from both sides and some barbs have residual small pieces of residual bone that haven't been removed. Sediment trapped within recesses is light brown in colour. The raw material is likely antler. The decorations present to the obverse are not mirrored to the reverse. Spongy bone is present across the surface, perhaps supporting the view that the piece is made in antler. No signs of any heating, ochre etc. across the surface. The repaired break may be old – no signs of any fresh bone. Some very fine and localised traces of glue which may suggest the piece has been removed from a mount during an earlier phase of curation, as seen in many of the other pieces. No corresponding signs of damage.

Box 332 AO7

Distal fragment of a biserially barbed point, light yellow to brown in colour. The piece is broken to the surface and the barbs to the left side are also broken. Each of these breaks looks to be old based on colour. Part of the break to the shaft may be more recent again

based on colour. Some localised dark brown/black traces look to be adhering sediment. The tip is relatively long and narrows to a rounded point. Some old damage disrupts the exact morphology of the tip. The barbs look similar to those described [Box 332 AO4]. They are long, broad and angular and have been heavily thinned. There are four barbs in total, two to either side, and they seem to be arranged symmetrically along the shaft. The barbs have been heavily shaped and wedges have been cut from the back of the barb to separate it from the shaft. This working has been done from both sides. A series of grooves run along the length of the shaft and along the barbs. There is no obvious functional reason for their presence. There are four long, slightly curving grooves that are positioned between the barbs in sets of two to either side of the piece. Each barb has two curving grooves that runs down the length of each barb. Each groove is deep and with internal striations, perhaps suggesting the side of a stone tool was used. These lines are almost certainly decorative. No signs of any heating, ochre etc. across the surface. Spongy bone is present to the reverse and this perhaps confirms the piece is antler. The decoration has not been mirrored to the reverse surface. Long relatively deep striations across the barbs look to be working traces. A localised patch of lighter bones looks to be recent damage. This may suggest the piece has been mounted and damaged during removal as seen in some of the other pieces. No signs of any heating, ochre etc. across the piece.

Box 332 AO8

Distal fragment of a biserially barbed point, broken across the shaft. The colour is a light grey/yellow. Some localised traces of light brown sediment are present across the surface. The tips of some of the barbs look to have recent breakage based on colour. Some fine longitudinal cracking is evident across the surface and this is natural. The break across the shaft looks to be old based on colour and a fragment has been refitted and glued. The tip is relatively long and slender and converges to a narrow point. No signs of any heating, ochre etc. across the piece. Two grooves, parallel to one another, run along the length of the piece. A single groove also curves and runs along the length of each barb. None of these grooves seem to serve an obvious function. Four barbs are present to the piece, two to each side. Interestingly, the upper and lower barbs are morphologically dissimilar. The upper barbs are smaller and tucked in to the broader morphology of the piece. The barbs are positioned asymmetrically along the length of the piece. The lower barbs are more akin to those seen in pieces AO4 and AO7. The barbs are large, thin and angular and have been heavily shaped. In both cases, separation of the barb from the shaft has been achieved by

cutting wedges from the back of the barbs from both sides. The removals are more extensive to separate the larger barbs. The raw material is antler. At least some of the damage looks to be recent across the shaft. The reverse side has spongy bone and this perhaps suggests the piece is antler. The grooves to the barbs look wide and internally striated, perhaps suggesting the grooves have been produced by working with the side of the tool. No signs of any heating, ochre etc. across the reverse surface. No decoration has been mirrored to the reverse surface. Only a single barb has a groove running down the middle. The second large barb may also have a groove but this is more ambiguous. Some localised patches of vibrant yellow bone suggests damage to the piece. Some small traces of glue suggest the piece may have been mounted and damaged during its removal during an earlier phase of curation.

Box 332 AO9

Medial fragment of a barbed point, light to deep brown in colour. The break to the proximal end looks to be old based on colour. The break to the distal end looks to be recent based on its vibrant yellow colour. Only one barb is present but the small size of the fragment makes it difficult to be sure if the piece is uniserial or biserial. The morphology to the lower right may be the beginnings of the front of a barb, making the piece biserial. No signs of any heating, ochre etc. across the surface. A group is disrupted to this side and this may indicate part of a barb. Two parallel grooves run down the length of the piece. A single groove running down the length of the barb also seems to be non-functional. The barb looks to be broken to both sides and these breaks look to be old. Breaks disrupt the grooves running down the length of the piece. The nature of the working of the barb is ambiguated based on the position of the breaks to the shaft and barbs. It can be presumed that they have been worked in a similar way to those barbs described for other pieces with wedges cut from the back to separate the barb from the shaft. No signs of any heating, ochre etc. across the surface. The raw material is likely antler, with spongy bone present to the reverse. The reverse looks to have traces of glue across the surface and this may suggest the piece was mounted and subsequently removed during an earlier phase of curation. The recent break to the piece may be associated with this removal.

Box 332 AO10

Fragment of biserial barbed points, broken to both ends. The break to both ends look to be old based on colour. A small chip of damage to the edge of the piece looks modern based

on its yellow colour. No signs of heating, ochre etc. across the surface. Two parallel grooves run longitudinally along the lengths of the piece. The barb to the right has a groove running along the length of the barb at the mid-point. These features don't appear to be functional. The bars are small and relatively rounded and are close to the main shaft. The barbs don't appear to be fully removed from the shaft but wedges have been cut from the back of the piece in the usual way to shape and define the piece. The grooves look to be part filled with light brown sediment. No signs of any heating, ochre etc. across the surface. The reverse has a spongy and probably the piece is made from antler. No sign of any decoration to this side of the piece. There look to be some possible disruption to the piece. There looks to be some possible disruption to this side of the piece but the usual traces of red felt and glue are not present. No signs of any heating, ochre etc. to the surface. The broader morphology of the piece can't be discerned.

Box 332 AO11

Small medial fragment of a barbed piece. The colour is deep brown across the surface. One of the break looks to be old based on colour. The other breaks looks to be recent based on the more vibrant yellow colour. The piece is rounded in cross section but appears quite angular due to the high density of engraving across the surface. There is a single barb to the piece that has been broken recently based on colour. The morphology of the barb can't be discerned based on this break. A groove runs down the length of the barb through the mid-point. Wedges look to have been cut from the back to separate the barb from the shaft. There is grooving across the surface with some notches cut into the edge, a curved groove and a series of small lateral grooves to the edge. This piece looks to be unique and this pattern doesn't look to be functional. From the remains of the fragment it isn't clear if the piece is biserial or uniserial as not enough is preserved. The raw material is likely antler. There is no decoration to the reverse surface by contrast. No signs of any heating, ochre etc. across the surface. Some spongy bone present to the surface. The groove looks to have been drawn on the reverse of the barb.

Box 332 AO12

Medial fragment of biserial barbed point, broken across the shaft to both ends and light yellow/brown in colour. Some traces of dark brown sediment across the surface. The breaks to both ends looks to be old based on colour. A modern break looks to have broken more of the piece off to one end and this is likely modern based on colour. There are two

barbs to each side, slightly asymmetrical with one barb broken at the mid-point to the bottom left. There are two sets of parallel and slightly diagonal grooves running from distal to proximal along the shaft. These lines commence slightly to the edges and may be associated with the position of the barb. The tip of the bottom right barb is also broken. Each barb has a groove running through the middle of the barb from shaft tip. None of these grooves seem to correspond to a function. The barbs look to have been heavily shaped and thinned in all directions. The barbs have been separated from the shaft by the cutting of wedges from the back of each barb. The working looks to have been from both sides. The raw material is likely antler. No signs of any heating, ochre etc. across the surface. Spongy bone is present to the reverse of the piece confirming the piece is antler. The grooves as described to the barbs on the obverse are also present to the reverse. The broader design has not been replicated in the spongy bone to the shaft. The reverse reveals a recent repair to the upper left barb where a recent break had removed the tip. A large concave zone of spongy bone is present to the lower portion of the shaft and is more vibrant yellow in colour. This piece has likely been mounted during an earlier phase of curation and this damage was caused during its removal. No signs of any heating, ochre etc. across the surface. The breaks to the lower set of barbs looks to be old based on colour.

Box 332 AO13

Medial fragment of biserial point light brown in colour. The proximal break looks to be old based on colour while the distal break looks to be recent based on colour. Two barbs are present, one to either side of the piece, and likely the very back of an additional barb that has been disrupted by the break. Two grooves run parallel and longitudinally along the shaft. This leaves a raised column of bone to the midline of the shaft between the grooves. Each barb has a single groove that runs through the midline of the piece to the edge. The barbs are akin to AO4 and AO7. They are wide and long and have been heavily thinned and are angular. They have been separated from the shaft by cutting wedges from the back of each barb. There looks to be some disruption to the surface of the piece to the proximal end and this could be taphonomic or perhaps even recent. No signs of any heating, ochre etc. across the surface. Some longitudinal striations are present across the piece and this is likely associated with the smoothing and shaping of the piece. Spongy bone is present to the reverse of the piece perhaps suggesting that it is composed of antler. The tip of the fragment of the left barb has a modern break to the tip based on colour. The barbs to the

reverse of the piece have also been grooved in the same way as the obverse. No signs of any heating, ochre etc. to the reverse. Spongy bone is present to the reverse perhaps confirming that the piece is antler. There is some disruption to the spongy bone with voids, patches of fresh yellow bone and some traces of glue and red felt. This suggests the piece was likely mounted during an earlier phase of curation and has been damaged during its removal. The recent break across the shaft may be associated with this damage.

Box 332 AO14

Fragment of biserial barbed point broken to both ends. The distal break is oblique and looks to be old based on colour. The proximal break looks to be young based on its more vibrant yellow colour. There are five barbs in total, three to the left side and two to the right. The barbs to the right are large and complete while the barbs to the left have either broken or been cut down to leave a lozenge shape. Some longitudinal striations run along the length of the piece and these are likely associated with smoothing and shaping the piece. The longer grooves each have a single groove running along the midline and curving along the length of the barb. A line running at the meeting point of the barb and the shaft may be working traces, present to each barb and perhaps associated with their shaping. If the short barbs were broken it was likely during antiquity based on colour. The grooves to the middle of the barbs may have been present to the original lozenge shaped barbs, a small mark may be the beginning of such a groove. No signs of any heating, ochre etc. across the surface. No signs of any decoration across the surface. The longer barbs are gently curving have been shaped to all sides and wedges cut from the back to separate them from the shaft. Some residual bone from this cutting remains between the back and bottom of the barb and the shaft. Some small black flecks are likely post-depositional manganese. Spongy bone is present to the reverse surface suggesting the piece is likely antler. The grooves present to the long barbs are also present to the reverse. There are some small patches of glue to the surface as well as localised patches of more vibrant yellow bone. This may suggest the piece has been damaged while being removed from a mount during an earlier phase of curation. No signs of any heating, ochre etc. across the surface. No signs of any further decoration.

Box 332 AO15

Proximal fragment of a biserially barbed point, light yellow/grey in colour. The piece is broken across the shaft and this break is likely old based on colour. There is an additional

repaired break across the shaft and this looks more recent based on its more vibrant yellow colour. There are some localised traces of dark brown sediment across the piece. The piece displays heavy traces of grooving across the surface. There is a central longitudinal groove running down the length of the pieces. Each of the barbs has a central groove running down the length of the barb. Each side of the central shaft groove has three curving grooves to each side. From distal to proximal, the first two sets curve to give a convex line relative to the central groove and the third group curve to give a concave line. This doesn't seem to serve any clear function. There are two barbs, one to either side and with some recent damage to the tip. They look shaped to all sides and with wedges removed from the back to separate the barb from the shaft. The distal has gently tapering end with a narrowing midshaft to leave a stop before the tapering base. This may have been used for attaching a line to the piece. No signs of any heating, ochre etc. across the surface. Spongy bone is present to the reverse of the piece and this suggests the raw material is antler. Some localised patches of more vibrant yellow bone suggest the piece has sustained some recent damage. Sediment, deep brown, is caught within the spongyoma in places. The localised nature of the modern damage as well as the presence of a recent refitted break may suggest the piece was damaged during removal from a mount during an earlier phase of curation. Some possible traces of glue may support their interpretation. No sign of any decoration to the surface. No sign of any decoration across the surface.

Box 332 AO16

Large fragment of biserially barbed point with breakage to both ends. The proximal break looks to be old based on colour. The distal break also looks old based on colour but with a recent additional break on top. The piece looks similar to the refitted fragments of [AO1] and [AO23]. The piece looks to have a similar base morphology to that described in [AO15] with a narrow shaft before reaching a bulbous protrusion to both sides with a gentle narrowing to give the attachment for the haft. The break makes the exact details difficult to establish but the form described seems likely. Dark flecks across the piece are likely post-depositional manganese. There are four barbs, two to each side. Those to the left side have their tips broken. The distal set of barbs is long and large and curves back and narrows to a fire point. The proximal barbs have a similar morphology but are shorter. Longitudinal striations across the piece likely relate to working and shaping the piece. The raw material is likely antler. The barbs have been worked to all sides and wedges removed from the back of the barb to separate it from the shaft. No signs of any heating, ochre etc. across the

surface. Decoration is present across the surface. The proximal barbs have a central groove running through the middle of the piece and running to the tip. The point where the barb connects to the shaft is marked by a chevron composed of two lines. The point of convergence points away from the barb. This pattern is evident to both barbs. The distal barbs each have two grooves running down the length of the barb, one of which runs to the tip of the barb. These barbs also have the chevron design. The right barb has an additional short line running down the length of the shaft and set between the chevron and the lines of the barb. No other signs of decoration present. The breaks to the barbs look to be old based on colour. The raw material is likely antler. The right distal barb has a break running through it and this has been repaired with glue present. Longitudinal striations likely relate to the working and shaping of the piece. Spongy bone is present to the reverse perhaps supporting the interpretation of the raw material as antler. Traces of glue are present across the surface. It is probable that the piece was once mounted during an earlier phase of curation. The recent break, the break to the barb and some localised disruption to the spongy bone are all likely damage relating to the removal of the piece from its mount during an earlier phase of curation. The pattern of grooves to the barb is also present to the reverse. However, the large distal barb has a single central groove rather than two grooves. Some localised traces of deep brown sediment caught within the spongy bone. No signs of any heating, ochre etc. across the surface.

Box 332 AO17

[note, the artefact doesn't seem to fit the box cut out] Long fragment of uniserial barbed point, deep light brown in colour. A break across the shaft may be old based on colour and also may show signs of having been refitted at some stage, with traces of glue present. Longitudinal striations running down the length of the shaft likely relate to shaping and working the piece. The break may actually be recent rather than a repair as the bone is a vibrant yellow. A barb is missing and this looks to be part of a larger, old break. A modern break is present on top of this. The piece also has a break running across the shaft and this looks to be a recent break based on colour. At least some of the longitudinal lines running down the piece may be fine intentional grooves. To the proximal a series of grooves to the edge and the unbarbed side have been drawn, high to the left and low to the right. These could perhaps have been used as a friction grip but given that long lines have been engraved along the shaft they may have been part of a design. There are four barbs to one side and a spare where a fifth have broken. Each barb is small and curve sharply so that the

tip of the barb is only a small distance from the front of the next barb. The barbs have been shaped and narrowed and a small deep wedge cut from the back of the barb to form the steeply curving barb and also the front portion of the next barb in sequence. Each barb has two short diagonal grooves drawn from distal to proximal. An additional groove to the shaft runs across the void between each barb and seems to link all of these elements into design. Between the final barb and the base the piece has been smoothed down and a further group of diagonal lines are present, drawn in roughly the same orientation as those already described. There is a raised notch of bone where the base begins and this is marked by a series of short lines running in the same orientation as the shaft. The proximal tip looks dull and rounded, almost as though it has been subject to some crushing in antiquity. The raw material is likely antler. It is improbable that the grooves and lines discussed are functional. No signs of any heating, ochre etc. across the surface. The notch may have been used to attach a line to the piece. Spongy bone is evident to the reverse, perhaps supporting that the piece is antler. The pattern of grooves to the barbs and shaft between barb is replicated to this side. The second barb from the distal end has three grooves instead of two. No signs of any heating, ochre etc. across the surface. Some fine longitudinal grooves are present to the base. These lines may be part of a design. No clear signs of the piece having been mounted, though the recent breaks make this a possibility in this case.

Box 332 AO18

Medial fragment of a biserially barbed point, light brown in colour. The distal break looks to be old based on colour and the proximal break looks to be recent based on colour. There are three barbs in total, two to the left and one to the right. These are spaced asymmetrically along the shaft. All of the breaks show some signs of any breakage. The tip to both barbs to the left are broken and this looks to be recent based on colour. The barb to the right has a more substantial break and this is likely recent based in colour. The raw material is likely antler. No signs of any heating, ochre etc. across the surface. Each barb has a groove running through the middle running from contact and running on to the tip, gently curving in the process. Associated with each barb is a groove running down the length of the shaft. Perhaps 2-3 times as wide as the barbs. The solitary barb to the right may have the beginnings of a second group though the barb is too broken to be sure. The cross-section is well-rounded. A longitudinal groove runs down the length of the piece underneath the single barb. None of these grooves seem to have a discernable function.

The old distal break also has some associated recent damage. No signs of any heating, ochre etc. across the surface. The barbs are relatively small and short and have been cut and wedged to separate the barb from the shaft. The cutting is modest and a thin column of bone still connects a portion of the barb to the shaft in each case. The pattern of grooving looks to be similar to that observed on pieces AO10, AO12, AO15. Spongy bone is present to the reserve, perhaps supporting the view that the piece is antler. The grooves present to the barbs have been replicated to the reverse. There are some localised traces of yellow bone across the surface which looks to be recent damage. Some traces of light brown sediment across the surface, especially evident within grooves. No signs of an heating, ochre etc. across the surface.

Box 332 AO19

Medial fragment of a biserial barbed point, yellow/brown in colour. The distal break looks to be recent based on its more vibrant yellow colour. The proximal end looks to be old based on colour. There are some localised red/orange traces across the surface and this could be red ochre. Some darker traces look to be sediment. There are four barbs, two to each side and these are positioned asymmetrically along the shaft. The barbs are quite large and only marginally curve towards the tips increasing the width of the piece considerably. The tips of the barb to the left side have been broken and this look to be recent based on colour. The barbs have been shaped from all sides and are quite rounded. Large wedges have been cut from the back of the barbs to separate them from the shaft. This leaves the back of the barb more angular than the front. Grooves are present across the piece. Each barb has a groove running down the centre of the barb towards the tip. Four grooves run down the length of the shaft and are gently curving in each case. The line typically curves towards the edge of the piece and then back in again in each case. There are two grooves to each side of the shaft but the grooves are distributed asymmetrically along the length. No signs of any heating etc. beyond that already mentioned. Spongy bone is evident to the reverse of the piece, perhaps suggesting the raw material is antler. The pattern of grooving to the barbs has been replicated to the reverse with each barb having a single, central groove. There is some spongy bone patches that are more vibrant yellow and look to be damaged. A long piece with a recent break to the shaft and one of the barbs, it is likely the piece has been mounted during an earlier phase of curation and damaged during its sequence of removal. No decoration is present to the spongy bone. No signs of heating, ochre etc. across the surface.

Box 332 AO20

Fragment of biserially barbed point, yellow/brown in colour and broken to both ends. The break to both ends of the shaft are vibrant yellow in colour suggesting the breaks are recent. Some localised darker traces of sediment are present across the surface. No signs of any heating, ochre etc. across the surface. The barbs are relatively short and thick. There are four in total, two to each side and dispensed symmetrically along the shaft. The upper row of barbs may have been cut to a shorter length. The barbs are angular and thick in all dimensions with little evidence of thinning. Small wedges have been cut from the back of each barb to separate it from the shaft. Two grooves run down the length of the shaft. They start and stop between the two sets of barbs. Each barb has two grooves running down the length of the barbs towards the tip. The upper set of barbs have a short extension to the upper lines that run a short way up the length of the shaft. The grooves running between the barbs seem to connect to the upper line in the second set of barbs. Some darker patches may be post-depositional manganese. Spongy bone is present to the reverse of the piece suggesting the piece is antler. Some localised vibrant yellow bone, along with recent breaks may suggest the piece has been damaged during removal from a mount during an earlier phase of curation. Each of the barbs has two grooves running down its length which somewhat mirrors the obverse surface. No signs of any heating, ochre etc. across the surface. No signs of any decoration to the spongy bone. The breaks to the bones look old based on colour. Some points of sediment evident to the edges, deep brown/orange in colour.

Box 332 AO21

Fragment of biserially barbed point, yellow/brown in colour and broken to both ends. The break to the distal end looks to be old based on colour. The break to the proximal end also looks to be old based on colour. No signs of heating, ochre etc. across the surface. Traces of deep brown sediment across the surface, especially so in grooves. Six barbs are present, three to each side, and these are positioned asymmetrically along the length of the piece. The barbs all seem to show signs of ancient breakage which has removed variable amounts of the barb in each case. The barbs are relatively large and straight, only gently curving, and project out from the shaft, widening the profile of the piece significantly. The barbs have been thinned and shaped to all sides and large wedges have been cut from the back of the barbs to separate the barb from the shaft. Each barb has two grooves running down its

length. The shaft has a longitudinal raised column of bone and a deep groove to each side, running down the length of the shaft. To the outside of each long groove is a series of grooves which bow outwards and fall between the voids between the barbs – as a result this design is asymmetrical from one side to the other. Four grooves are present to the left side and three to the right. There would appear to be no functional reason for these grooves. The shaft grooves look to have been drawn first – a groove of one of the barbs looks to cut through the shaft detail. The breaks are confirmed as old to the reverse surface. No signs of heating, ochre etc. across the surface. The central zone of the piece is composed of spongy bone, suggesting the piece is likely antler. Elements of the design of the obverse have been repeated to the reverse. Each barb has two grooves running along its length. A central column of raised bone is present flanked by a longitudinal groove to each side. The curving grooves noted to the obverse are not evident to the reverse pattern. Some finer longitudinal striations are present and this likely relates to the smoothing and shaping of the piece. Some very fine traces of glue and red felt suggest the piece may have been mounted during an earlier phase of curation. A localised vibrant yellow patch may be damage associated with removal from this mount.

Box 332 AO22

Proximal fragment of a barbed point, yellow to light brown in colour. Some traces of deep brown sediment across the surface. The break to the distal end of the piece looks to be old based on colour. The proximal tip has a small recent break based on colour. The raw material looks to be antler. The piece has a gently tapering base for hafting and two small rounded projections of bone, symmetrically placed, and well rounded. These were likely used for attaching a line to the piece, only a single barb is present and the break makes it difficult to know if the piece was uni or biserial. The barb is large, wide, thin and angular, and projects out from the shaft. It has been extensively shaped and thinned to all sides and wedges cut from the back to separate the barb from the shaft. Two grooves have been engraved along the length of the barb. At the mid-point to the shaft, a series of diagonal grooves have been engraved across the surface. As this occurs after the haft it can't be related to a friction grip. There are three grooves drawn from the centre to the edge. The tip of the barb has sustained some recent damage. Spongy bone is present to the reverse surface and this confirms the piece is antler. A groove runs down one side of the piece and the barb has two grooves running along its length. There are no obvious functions for these

lines. No signs of any heating, ochre etc. across the surface. There are traces of deep brown sediment across the surface.

Box 332 AO23

Proximal fragment of a (presumably) barbed piece, light yellow in colour. The morphology is very similar to AO22 though the shaft narrows towards the toggles in this example. There is a break across the piece below the toggles that has been repaired. The break across the shaft looks to be old based on colour. The raw material is antler. There is spongy bone present to the centre of the piece. Some fine longitudinal cracks are likely natural. Some localised patches of sediment are dark brown in colour. No signs of heating, ochre etc. across the surface. A small diagonal groove to the edge may be associated with a barb, now lost to fragmentation. The toggles are more prominent and pointed in this example and are symmetrical. They were likely used for attaching a line. Some fine, longitudinal striations likely relate to smoothing and shaping the piece. Some very small patches of red felt and a localised disrupted patch of spongy bone may suggest the piece has been mounted during an earlier phase of curation and damaged during removal. The obverse has a number of grooves across the surface. A groove runs across the centre line of the toggle. A series of four short, wide diagonal grooves run across the shaft from top right to bottom left. Below this and above the toggles, two grooves join to form an elongated ellipse. These grooves are disrupted by the groove running across the toggles. A sweeping groove runs across the shaft and an additional line flicks up towards the toggle. This toggle has some fine lines in parallel between this groove and the groove running across the centre of the toggle. Could this be part of an animal design? Perhaps a fish? Some fine striations to the edge of the shaft suggests some of this could possibly be working traces. Some marks to the other end of the ellipse have been made with the side of the tool. They could be working traces or possibly even fins.

Box 332 AO24

Proximal fragment of a (likely) barbed point, light brown in colour. The break across the shaft is oblique and looks to be old based on colour. No signs of any heating, ochre etc. across the surface. The morphology of the piece is similar to AO22 and AO23. The piece has a short, gently tapering base where it would be inserted into the haft. It also has small, rounded symmetrical toggles which may have been used to attach a line to the piece. No signs of any heating, ochre etc. across the piece. The centre of the shaft has been left

raised and is flanked to either side by a deep groove which runs down the length of the piece. To the right side a groove runs from the bevel, cuts over the top of this groove and runs through onto the base, getting increasingly shallow. The raw material is likely antler. This design doesn't look to be matched to the other side and toggle, perhaps because this toggle is smaller. The break also has a crack running through it where an additional piece may have broken and been refitted. The reverse of the piece has spongy bone across the surface. Part of the piece has red felt/glue traces and some of the bone looks to have been removed. This corresponds with the flake of bone that has been refitted, suggesting the break was recent and likely a result of the removal of the piece from its mount during an earlier phase of curation. A groove runs down the length of the piece to one side but no other grooves are evident. The toggles look more asymmetrical in position to this side. No signs of heating, ochre etc. across the surface. No functional reason can be discerned for the grooves across the piece. These grooves may be decorative.

Box 332 AO25

Proximal fragment of a (likely) barbed point, light brown/yellow in colour. The piece is broken across the shaft and this looks to be recent based on its more vibrant yellow colour. This may be a recent break on top of an old break. A short gently tapering based was likely hafted. Two small toggles above the haft are likely for attaching a line to the piece. The morphology of the piece is similar to AO22, AO23 and AO24. The toggles are especially small in this piece and quite well rounded. The surface may have suffered from disruption, much of the shaft texture looks flakey like parts of the bone have eroded away. No signs of any heating, ochre etc. across the surface. Some localised dark flecks may be manganese. There are two longitudinal grooves running down the length of the shaft but they are very fine compared to some other pieces. No functional role can be discerned for these grooves. Spongy bone is evident to the reverse suggesting the piece is antler. No signs of any grooving to the reverse. Localised patches of yellow bone suggest the piece may have been mounted during an earlier phase of curation and damaged during removal. The break to the shaft may have been caused by this. No signs of heating, ochre etc. across the surface. The base of the piece looks to be disrupted and this looks to be old based on colour. Spongy bone is present to the reverse of the piece, suggesting it is antler. No signs of any heating, ochre etc. across the surface. Some more localised yellow bone suggests the piece may have sustained some recent damage. This could possibly be from an earlier mounting

of the piece and damage during its removal. However, there are none of the usual traces of glue and red felt.

Box 332 AO26

proximal fragment of a biserially barbed point, light brown/yellow in colour. Some darker flecks across the surface look to be post-depositional traces of manganese. The break to the distal end across the shaft looks to be recent based on its more vibrant yellow colouration. Two further breaks across the shaft look to be recent based on colour. The proximal tip also looks to be broken, recent based on colour. The morphology of the piece is similar to AO22, AO23, AO24, and AO25. However, this piece is more complete and has some barbs. This may suggest the pieces described previously were all biserially barbed points, the piece has two small, asymmetrically positioned toggles. Small and well rounded. These were likely used to allow a line to be attached to the piece. Two barbs are present to the piece, one to each side. They have both been subject to recent breakage and so it is difficult to reconstruct and describe the morphology. The barbs look to be relatively small and tucked in close to the shaft. The barbs have been shaped to all sides to give a short and thin barb, curving back and relatively angular. Wedges have been cut from the back of the barb to separate it from the shaft, working from both sides. Each barb has a single groove running down the length of the barb along the mid-point. There are no clear functional reasons for these grooves. No further grooves are present. No signs of any heating ochre etc. across the surface. Glue can be seen in the cracks of the refits. The gently tapering proximal tip was likely for attaching to a haft and being easily detachable. Some spongy bone is present to the reverse surface suggesting the piece is antler. Much of the reverse surface is vibrant yellow in colour and this may suggest the piece has been subject to disruption. No signs of any heating, ochre etc. across the surface. The extensive disruption and number suggests the piece may have been mounted during an earlier phase of curation. No associated traces of glue and/or red felt to support the interpretation. The grooving present to the obverse of the barb is also present to the reverse. No other signs of grooving. No signs of any heating, ochre etc. across the surface.

Box 332 AO27

Fragment of (presumably) barbed piece, light to deep brown in colour and broken to both ends look to be old based on colour. The piece is similar in morphology to AO22, AO23, AO24, AO25 and AO26 but is much thinner, almost like a half round rod. No barbs are

evident to the piece, likely lost to the distal break. Some of the darker traces across the piece may be sediment adhering to the piece. No signs of any heating, ochre etc. across the surface. The surface looks to be heavily disrupted and eroded. This has disrupted some of the grooves to the surface making them more difficult to recognize. There are at least four short, diagonal grooves running across the surface, two to each side of the piece and positioned close to the edge of the obverse surface. The shaft gently tapers from distal to proximal before jutting back out and then gradually tapering again. This morphology produces a similar effect to the toggles seen on other pieces and may have been used to attach a line. There is no obvious functional reason for the grooves across the surface. The reverse surface is composed entirely of spongy bone. The raw material is likely antler. The surface is flat, giving a half round cross-section. There is some variation in the surface of the piece. While the coloration is dark this may be indicative of some disruption, perhaps in antiquity. Some traces of glue are present to the distal end and this may suggest the piece has been mounted during an earlier phase of curation. No obvious signs of damage from the removal of the piece from its mount.

Box 332 AO28

Proximal fragment of a biserially barbed point, yellow in colour. The piece refits with AO1. The break across the shaft is ancient based on colour. There are some pits and voids in the surface of the antler, perhaps suggesting some erosion to the piece. Some darker traces across the surface are likely post-depositional manganese traces. The proximal end has as a short tapering base for a piece that would be readily detachable from the haft. The piece also has toggles towards the proximal end. They are relatively small and well rounded and are positioned symmetrically along the length of the shaft. One of the toggles is larger than the other. No signs of any heating, ochre etc. across the surface. Two grooves run longitudinally down the length of the piece and connect with grooves already described to AO1. The barb has a single groove running along its length at the mid-point. The toggles were likely used to attach a line to the piece. Some fine traces of light brown/yellow sediment across the surface, and especially within some of the voids in the surface. There is a break to the tip of the barb, recent based on colour. The reverse has spongy bone across much of the surface. The surface is heavily disrupted by glue and red felt. This suggests the piece has been mounted during an earlier phase of curation, some more vibrant yellow patches of bone and voids suggest the piece has sustained damage when it was removed from its mount. The groove to the barb looks to have been replicate to this surface though

it is partially filled with sediment. No signs of any heating, ochre etc. across the surface. No further sign of decoration across the surface. The break across the shaft look to be old based on colour. There is sediment across the break.

Box 329 AO29

Small, thin angular fragment of antler, deep brown in colour. Both ends of the piece look to be broken and these breaks look to be old based on colour. Lighter brown traces across the surface are likely fine adhering sediment. One edge has a wavy profile with fine peaks. These could be the beginning of barbs. A series of long diagonal grooves run across the surface. These run from one edge and run diagonally at a shallow angle for some distance but do not reach the other edge. These look somewhat like those grooves for a friction grip but such an interpretation seems unlikely in this case. These grooves don't seem to correspond with any discernable function. The 'barbs' are small and very well rounded, with no separation from the shaft. No signs of any heating, ochre etc. across the surface. Spongy bone is present to the reverse of the piece, perhaps suggesting the raw material is antler. No signs of any heating, ochre etc. across the surface. A number of grooves are present around the 'barbs' to this edge and these could be localised traces of shaping and working. They are finer than the grooves to the obverse surface. No traces associated with an earlier mounting of the piece. The reverse is flat, giving an almost half round cross section. This seems to be a rare/unique form amongst the barbed pieces. Some modest, localised traces of more yellow bone to the reverse but this is less compelling as evidence of mounting than those seen on many pieces.

Box 331 AO1

Piece of sandstone, even grain size across the piece. The piece is likely of non-local origin and has been deliberately used for these properties. There are a number of well rounded grooves across the piece that have developed as a result of the shaping of needles. These grooves are partly filled with post-depositional manganese. The colour of the piece is dark yellow with dark grey/black patches of manganese across parts of the surface and within grooves. Different sizes of groove indicate different sizes of blank. The raw material is a fine grained sandstone, relatively well cemented and even across the piece - there are no inclusions. The raw material, sandstone, is non-local to the region suggesting the piece has been imported specifically to the site, likely for its fine texture and specifically for its grinding potential for needle/point working. Some of the shorter grooves could be from

resharpening needles and small points. The orientation of working is largely along the long axis of the piece.

Box 331 AO2

Fragment of a long bone, light brown in colour. The piece is broken to both ends and these breaks look to be old based on colour. Spongy bone is evident to the centre of the shaft to these breaks. Around the piece are a number of relatively long and deep grooves. These run along the long axis of the piece and have been disrupted by the breaks to both ends in most cases. Some localised patches of more vibrant yellow bone look to be more recent damage. The piece has been used as a needle/small point core, each groove representing a removal via groove and splinter. Taken with [Box 331 AO1] this suggests the complete production and working sequence for needles and points at the site. Grooves are deep 'v' shaped and show striations along the walls of the grooves, suggesting each groove has been cut with multiple lines to extract the splinter. No signs of any heating, ochre etc across the surface. No signs of any decoration across the surface. The reverse surface has no removals, They are all positioned to the obverse and edge of the piece. The piece is gently curving which suggests it isn't a long bone but likely a different bone element. It looks too thick to be a cut rib. Could be antler? Some small, regular holes to the reverse look anthropogenic (?) but recent. This could be a result of the piece being pinned and mounted at some point during its curation? The holes look to be too localised to be natural. No signs of any heating, ochre etc. across the surface. Some disruption to the surface looks to be erosion to the bone. The groove could equally represent blanks for fish gorges as well as needles and points.

Box 331 AO3

Small splinter of bone, vibrant yellow in colour. The piece is relatively well rounded and has been smoothed and shaped, likely via grinding. The splinter was likely produced via groove and splinter and may have been removed from a core akin to [Box 331 AO2]. The piece looks to have been reworked and shaped much like a needle but this piece has a point to both ends. The middle of the piece is wider and the ends taper to give a sharp, fine point to either end. The piece has been described as a fish gorge in the box label. No signs of any heating, ochre etc. across the piece. No signs of any decoration across the piece. Some traces of glue and red felt are present across the surface suggesting the piece has been mounted during an earlier phase of curation. No signs of associated damage to the piece.

No signs of any heating, ochre, decoration etc. to the obverse. Some angular edges remain from the shaping of the piece. The raw material is likely bone. Possible bait-holder.

Box 331 AO4

Small splinter of bone, deep yellow/brown in colour. Fine longitudinal striations are likely linked to working and shaping the piece. The piece has likely been ground into shape from a bone splinter removed from a core akin to [box 331 AO2]. The piece is wider in the middle and narrows to a fine point to both ends. The piece has been worked in a similar way to a needle. No signs of any heating, ochre etc. across the surface. No signs of any decoration, across the surface. The piece has some traces of glue and red felt across the surface, suggesting the piece was mounted during an earlier phase of curation. The piece is described as a fish gorge on the box label. The tip of one end looks to have a small break, old based on colour. No signs of any heating, ochre etc. across the surface to the obverse. No signs of any decoration to the surface. Some of the edges are angular giving some sense of the planes of the working during the shaping of the piece. No signs of any decoration to the surface. Possible bait-holder.

Box 331 AO5

Large splinter of bone, light to deep brown in colour. The piece is broken to one end and this looks to be an old break based on colour. The piece is widest in the middle and gradually tapers to a point to both ends. The broken ends look to taper more sharply than the unbroken end. The piece is relatively well rounded in cross-section though is somewhat angular to the edges. This gives some sense of how the piece has been worked down and shaped/smoothed. The raw material is likely bone/antler. The splinter was likely worked from a bone/antler core akin to [Box 331 AO2] and may have been shaped by a fine grained stone, such as [Box 331 AO1]. No signs of any heating, ochre etc. across the surface. No signs of any decoration across the surface. There are traces of glue and red felt to the reverse surface and this suggests the piece was likely mounted during an earlier phase of curation. The piece is morphologically similar to the fish gorges though its larger size may suggest the piece is a small point. Some longitudinal striations are likely linked to the working and shaping of the piece. No signs of any heating, ochre etc. to the obverse. No signs of any decoration to the obverse. There is a possible break through the middle of the piece. It has been repaired if it has broken. The morphology of the piece is more fish gorge like than point like e.g. it has no bevels. Possible bait-holder.

Box 331 AO6

Large needle, deep brown/grey in colour. The tip has a small break and this looks to be old based on colour. There is a break across the middle of the shaft and this has been refitted. This looks to be old based on colour. The piece has been made from a splinter of bone, likely removed from a piece akin to [box 331 AO2]. The cross-section of the piece is well rounded. The piece has been smoothed and shaped, likely using a fine grained sandstone or similar material, such as [Box 331 AO1]. No signs of any heating, ochre etc. across the piece. No signs of any decoration across the surface. There is a small, delicate perforation to the proximal end and the bone wall around the perforation is extremely thin. This almost certainly points to the piece having been perforated first and then the piece was thinned and ground into shape. The piece has traces of glue and red felt across one edge suggesting the piece has been mounted during an earlier phase of curation. Microscopy reveals that the perforation was likely worked rotationally with grooves running around the inside of the perforation. The size of the piece may relate to the nature of tasks in which it was employed.

Box 331 AO7

Large splinter on bone, light yellow in colour. The piece looks to be a needle. The tip of the needle is broken and this looks to be a recent break based on colour, more vibrant yellow in colour across the break. No signs of any heating, ochre etc. across the surface. No signs of any decoration across the surface. The raw material is likely bone. The piece was likely produced by removing a splinter of bone via groove and splinter from a core akin to [box 331 AO2]. The piece was perforated next, likely via rotational action with a stone tool. The piece was then shaped and smoothed via grinding, possibly with a piece akin to [box 331 AO1]. No signs of any heating, ochre etc. across the surface. One side of the piece has extensive traces of red felt and also traces of blue felt or card with glue. This suggests the piece was mounted during an earlier phase of curation and has been removed at some stage. The breakage to the tip may have been a result of this removal. The cross section of the piece is elliptical and flat. The perforation is small and delicate and was likely produced via rotational action via a stone tool. The size and shape of the needle likely relates to the nature of the tasks in which it was employed. There are some markings to the obverse surface but these are more likely post-depositional than anthropogenic decoration. There may be some traces of red ochre/sediment within the perforation.

Box 331 AO8

Small splinter of bone, varying in colour from deep grey to the proximal to almost white to the distal tip. The piece is a needle with a clear perforation. The piece was likely made via groove and splinter. The blank would have the perforation produced before being grinded into shape on a fine stone or similar material with coarse texture. No signs of any heating, ochre etc. across the surface. No signs of any decoration across the surface. The perforation is delicate and the bone wall around the perforation is extremely thin. The cross section of the piece is well rounded. The short size of the piece may relate to the range of functions to which the needle was employed. It may also reflect a piece at a later phase of its life history when it has been subject to several phases of resharpening and/or breakage in use and reworking. Traces of red felt and glue are present to the reverse of the piece. This suggests the piece has been mounted during an earlier phase of curation and subsequently removed. No signs of any heating ochre etc. across the surface. No signs of any decoration across the surface.

Box 348 AO4

Long fragment of a possible point, broken to both ends and deep brown in colour with some yellow patches. The raw material is likely antler. The cross-section of the piece is semi-circular, like a half-round rod. The piece has been repaired with a crack running across the shaft. Traces of glue indicate a recent refit. The piece is long, relatively narrow and tapers to both ends. The tip of each end has been broken. The end with grooves has a break to the very tip and this looks to be old based on colour. The other end has a more substantial break and this looks to be recent based on colour, more vibrant yellow. Some longitudinal striations to the edge are likely working traces associated with shaping the piece. The obverse has occasional patches of vibrant yellow one and this is likely recent damage. Grooves are present to the less damaged end and these look to be arranged in a similar fashion to friction grips seen elsewhere on other pieces. The reverse of the piece has spongy bone exposed perhaps supporting that the piece is antler. The reverse of the piece is flat and smooth and gives the piece a half round rod type cross section. Grooves are present to this surface. They are especially concentrated to both end but extend towards the middle of the piece. These grooves are akin in formation to friction grips seen on other pieces in the collection. No signs of any heating, ochre etc. across the piece. There are traces of glue and red felt in localised patches across the reverse. The typical vibrant

yellow patches of bone across the surface are minimal. This suggests the piece has been mounted during an earlier phase of curation and subsequently removed. The recent break and refit are likely a product of the removal of the piece from its mount.

Box 348 AO5

Long fragment of a possible point, deep brown in colour and with numerous more vibrant yellow patches. No signs of any heating, ochre etc. across the surface. The morphology of the piece is akin to [box 334 AO4]. The ends of the piece taper to a relatively fine point but with breaks to both ends. There is a break to the mid-point of the piece that looks to be recent based on the presence of vibrant yellow bone within the crack. Red felt and glue are present in localised areas across the surface. This suggests the piece has been mounted during an earlier phase of curation and later removed from its mount. The break to the middle of the piece may be the result of removing the piece from its mount. The cross-section of the piece is semi-circular, like a half round rod. The smaller break to the more complete end looks to be recent based on its more vibrant yellow colour. The larger break on the other end may also be recent but is more likely old, the colour of the exposed bone a deep orange. No signs of any heating, ochre etc. There are some fine longitudinal striations running along the length of the piece, likely a result of smoothing and shaping the piece. To the narrower end is a series of grooves which look like a friction grip. These run diagonally across the piece. The reverse surface is flat and spongy bone is present, suggesting the raw material is likely antler. The piece has long diagonal grooves running the width of the piece, relatively regular. No signs of any heating, ochre etc. across the surface. The grooves may suggest the piece was used in part due to the friction groove. Could this arrangement of grooves suggest the piece was one side of a composite point, glued back together?

Box 348 AO16

Fragment of a possibly single beveled point, broken to both ends and possibly the reverse. The raw material is likely antler. The colour is light brown/grey. No signs of any heating, ochre etc. across the surface. Localised dark traces are likely post-depositional manganese. Longitudinal striations and cutmarks with raised areas of bone are likely a result of working and shaping the piece. All breaks look to be old based on colour. The bevel has a series of grooves across its surface but localised to the bevel. These grooves run at a shallow angle across the bevel and are disrupted by the break. These grooves likely form a friction grip for the piece. The colour section of the piece is roughly quadrangular. Spongy bone is present

to the reverse surface, supporting the view that the piece is antler. The breaks to both ends looks old based on colour. Some localised patches of yellow bone across the surface suggest the piece may have sustained some recent damage. Traces of light brown sediment present across the reverse surface, especially within voids in the bone.

Box 348 AO9

Small fragment of bone, deep brown/lack in colour and broken to both ends. The breaks look to be old based on colour. Based on colouration it is probable that the piece has been burned. The cross-section of the piece is roughly semi-circular. The reverse of the piece is flat and has numerous longitudinal lines. These likely correspond to the working of the piece and look to run in both directions. Two wider, deeper, diagonal grooves run through the piece and these look to cut through the previously described working traces. The edges also display some working traces but these are much less frequent than the reverse. Part of a wide longitudinal groove remains to the obverse with internal striations but otherwise shows no other details. It is difficult to consider the full object with such a small fragment remaining. There are traces of light brown sediment across the surface. The piece is significant as it is one of the few with clear signs of burning.

Box 352 AO20

Fragment of pottery. Likely burnished and with decorative grooves running across the surface. Definitely pottery it has fine sand inclusions which have been used as temper/filler. This is suggestive of some mixing or incorporation of material into ancient layers. Second piece of pot from the collection. These likely stem from the upper layers of the site that were unrecorded from Bétirac's analysis.

Box 345 AO2

Fragment of worked antler, deep brown in colour with some patches of more vibrant yellow bone. The piece is broken to both ends and these look to be recent based on the more vibrant yellow colour of the bone. The piece is semi-circular (half-round) where the reverse surface has been cut flat. Some spongy bone has been exposed to the obverse surface. The piece is wider to one end and has been cut and rapidly tapers and converges to the other. Engraving is present across the surface. A series of grooves run diagonally across the piece to the narrow end. These are even, parallel and closely spaced. Several additional grooves run almost in opposite orientation and are cut by these more numerous

grooves. Only a few lines run in opposite orientation. The wide end may have been subject to cutting and grooving. There is a central raised triangular zone of bone, itself undecorated, with deep wide cuts to either side. A long deep groove runs from the edge of the wide end diagonally across the piece towards the narrow end. Two shorter, parallel grooves run from the wide end diagonally across the piece but these are much shorter than the line previously described. It could be that these lines collectively represent decoration. The cutting and grooving may be from shaping the centre of the piece to be removed? This is unlikely given the overall shape of the piece. Could the piece be like a half round rod and have a corresponding half? The lines to the narrow end might then be bevels and grooves for a friction grip. The reverse surface is composed of spongy bone perhaps supporting the piece as antler. There may be some diagonal grooves across the surface but this is more challenging to see in the spongy bone. These grooves are localised to the narrower end of the piece and look almost chevron like. There are some localised traces of glue across the surface and more vibrant yellow patches of bone. This suggests the piece was likely mounted during an earlier phase of curation and has been damaged during an earlier phase of curation. No signs of any heating, ochre etc. across the surface. The chevrons may just be localised damage and fortuitous.

Box 345 AO3 and AO6

[these pieces have a recent refit and gluing. They are being treated together as the refit has failed]. Fragment(s) of a barbed piece, yellow/brown across the surface. No signs of any heating, ochre etc. across the surface. The proximal has a narrowing profile, tapering to a point, though disrupted by recent breakage. The distal end has a recent break across the shaft and this looks to be recent based on colour, more vibrant yellow in colour. The piece is broken and glued at the mid-point and this has subsequently broken again (AO3 and AO60). Presence of glue within the break. The barb also shows evidence for a recent break, yellow based on colour. Wedges have been cut from the back of the barb to separate the barb from the shaft. The piece has diagonal grooves across its top edge and obverse surface across the entire length of the piece. The reverse surface has extensive traces of disruption in the form of red felt and glue and vibrant yellow traces of bone. This suggests the piece was likely mounted during an earlier phase of curation and damaged during its removal. Much of the yellow bone and breakage corresponds with this removal.

Appendix 10. Additional organic objects summary table

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Appendix 10 presents a summary table of additional organic objects found at Montastruc. Some of these objects are described in detail in appendix 9. These objects are variable but are united through not being classified as art within the British Museum for the purpose of organising and storing the collection. As such, they were not published in Sieveking's (1987a) catalogue of Palaeolithic art at the British Museum. The table notes their box number to facilitate their relocation within the museum. The boxes are stored within the organics store of Franks House under temperature and humidity controlled conditions, along with the Palaeolithic art objects. A content and quantity of each box is noted and a brief summary offered, detailing points of interest or initial pertinent observations.

Appendix 11. Photographs of additional organic objects

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Appendix 11 is composed of a systematic series of images from each box of organic objects beyond those defined as organic art by the British Museum. Minimally, each box is represented by an example image to give a sense of its contents. More typically, an image of the full range of objects is presented, with objects still in place within the box. In some cases, especially barbed points and harpoons, a more extensive images series is produced, as these objects in particular will likely be of help to the specialist in dating and further interpreting the site. The structure of the appendix is wedded to the structure of the collection as stored in the British Museum. Images are presented by box, each box typically storing a range of organic objects, usually but not always ordered by type. The images are presented digitally. The images are organised and presented via the British Museum box numbering system. Each file is titled according to the box in which it can be found, the box number in turn refers to a location with the organics stores Franks House. The images are of a working shot standard and were produced rapidly to facilitate the full analysis of the organics assemblage and due to time constraints. A further constraint in relation to these objects was the need to work rapidly while within the organics store to avoid a significant fluctuation in temperature or humidity, limiting the working window to around 20-30 minute sessions. As such, a compromise has been made in quality and composition, favouring quantity and range over a publishable standard of photography. The images typically lack scale bars as a result. Images have been only minimally processed by cropping extraneous background detail or white space, and additionally via automatic white balancing using GIMP software to compensate for the variable and typically low ambient light within the organics store, Franks House, where the images were taken.

Appendix 12. Plaquette microscopic descriptions

Plaque no. 658

Unavailable for further study – long term loan at the time of analysis.

Plaque no. 659

A: lines of the back do not appear to contact near the tail. Top line on its own, bottom line moves into the tail as one smooth line, some feathering of the line near the mid point where a dimple in the surface enhances the shape and visual impact of the animal.

B: finer vertical line cut by wider, deeper line, giving the appearance of the belly. It is a natural groove with raised fossil inside, vertical line cutting it.

C: several strokes to make the line of the belly. Front lines of the legs do not cross so difficult to establish order beyond this. The line that run out to a point in the horizontal may begin next to a natural groove near the legs. Front leg may cut through back leg.

D: lines of the legs do not overlie one another. Contra Sieveking, the join with the tail is less robust than depicted, with a natural depression perhaps being used to enhance the rump and rear leg. Heat fracture and pot lids disrupt the lines of the legs. She is largely correct but the front leg is in the dimple rather than running around it. Front leg does meet belly but can't tell line order.

E: confirmation of horns, cut by break running through the piece, again linked to heating. They don't seem to connect with any of the other lines. Similar to No. 658, use of edge to give depth in $\frac{3}{4}$ perspective.

Plaque no. 660

A: front leg is cut long wide horizontal arrow. Front leg in the foreground drawn before the background leg. Line of the neck and front leg is ambiguous with ink almost filling the grooves.

B: an arrow seems to run through everything, including deep horizontal grooves and belly. This line is broken only by some deep pockets of damage, presumably natural and perhaps post-depositional. Again, this would be consistent with a model of main outline first and

then followed by other details. Relationships 3 horizontal deep wide grooves is again the arrow overlaying (double check?).

C: back leg in the foreground drawn first, then line of the leg in the background added afterwards. Line of the belly looks to have been first, going from right to left, then followed by the leg. Rear of the back leg doesn't contact the back/tail. Looks to have been drawn from the top of the leg towards the bottom in 3 main lines to achieve the curving line. Line 2 is misjudged and line 3 corrects line 2 to give a more proportioned lower leg. This relationship confirmed under the microscope, though difficult due to the presence of ink. Confirmed that the back leg doesn't join the back/tail. Tail does join the tail in one line.

D: the line of the back is deep and made of several lines. The nearby lines suggesting fur are almost full of ink but look fairly regular and uniform, perhaps suggesting they were made together and with the same total. Difficult to be sure of which way the line was drawn but more likely top to bottom given the arrangement of lines moving along the curve. The dashes making up the back are fairly consistent in terms of depth and length. Difficult to know line order here as there are no cutting lines. Some natural grooves may have been followed as a loose guide line to produce this row of marks.

E: mouth/nose depicted, disrupted by later damage. The eyes are made with several curving lines, perhaps to enhance and correct the size. Relationships with dashes cant be established as there are no cutting lines. The line of the neck runs alongside the line of the horn. Given the orientation of the head, it more probably came first. It would be more difficult to draw the other way around. Line of the outside horn is questionable. Poor match with the 3D model and the area is covered in ink so hard to know if these are real. 3D model does show the top of the head and the beginning of the two sides of the horn. Lines depicting fur nearby are older – some possible disturbance around the horn. End of the inner horn has some additional lines near the point perhaps suggesting it changes orientation and runs on.

Plaque no. 661

1A: line of the belly comes first followed by the legs which cut this. Line of the legs are deeper than the line of the belly. Some finer additional lines may in turn cut the leg lines.

1B: the leg in the foreground has been drawn first and is in good proportion that is too static for the rest of the depiction. The leg in the background has been drawn after and fitted to the shape of the belly and the foreground leg. The shape of the back of the background leg has been modified and pulled in to differentiate one leg from the other. They have been drawn from top to bottom. The lines separating hoof from leg were added after the completion of the legs, cutting the vertical lines of the legs. The points of the hoof in the foreground leg don't actually meet. Confirmed, front of foreground leg first, back of the background leg cuts into and widens this line. The back of the legs are drawn after the front of the legs from top to bottom. Some flaring out of the main groove in this orientation.

1C: the faults/cracks were already present before engraving. Presence of engravings have had no impact on the angle of cracking or faulting. The join between the back leg and tail is all but eroded. Cant confirm the relationship as outlined by Sieveking. However, the line of the back and the tail is a continuous one, likely suggesting the end of the tail is the terminus for the line of the back running left to right. The tail runs into a natural crack which is used to finish the tail and give the other half. A curving section is added to the top of this to connect with the rest of the body. Probable order is back/tail, leg, additional adjoining section of tail.

1D: line order of the back curves to give the hump and skirts a depression which is used to give more definition to the front legs. The model only provides limited help as we move towards the head, though lines can be observed at macro level. Some support for a left to right orientation of the back – the curving lines of the hump is cut by a second line which comes in below and changes the orientation for the rest of the line. The line of the back into the neck becomes more feathered with several finer lines. Conceivable for the hump to be first turning into the line of the back. Internal lines added later.

1E: the horn and the dome of the top of the head are all one line and this same line merges with the line that runs vertically to give the front of the face. There may be a small piece of lithic embedded in this line or it may be a natural inclusion. It is probable that the verticle for the face was added first and then the lower horn and curving horn/head line were added after. The eye is prominent and was likely added later, as was all internal detail. The

vertical line forming the mouth and lower face is continuous with the rest of the vertical line for the face.

1F: there appears to be no connecting line between the head and the bottom of the neck/chest. There may be reliance on a natural crack to hint at this, with some vertical dashes giving a stronger sense of the neck. This progresses onto the front legs. The arrangement of the front legs is peculiar, reaching forward. Foreground leg is drawn first and the background leg follows. This is made difficult to spot as it is later than but sits in front of, the foreleg.

1G: the two curving lines that form a sickle shape seem to cut the line of the belly, suggesting they are a later addition. It is probable that the line of the belly was drawn first, followed by the finer lines suggesting fur. This line then goes on to meet with the back legs that cut it. There is an additional line above the line of the belly with a protrusion not dissimilar to the large sickle shaped lines already described, but much smaller. This may have been the line of the belly but has been changed?

2: the second bison uses the rounded edge of the support to act as the hump and this is accentuated with a line that gives the back. A natural crack may have been used to suggest the underside of the face and neck.

2A: a continuous line forms the front of the face and the nose, curling around to give the nostril. A line branches from this to give the rest of the nose and mouth and continues on beyond a point that would be anatomically sound. The eye is a simple circle with line above, likely added after the design of the face outline. The horns don't seem to cut the line of the head but were again likely added later once the proportion of the head was established.

2B: other lines for this piece are non-connecting. There may be the suggestion of a tail and a leg. A faint line may be the suggestion of a belly, possibly with a leg projecting from this. No additional detail is apparent.

Plaque no. 662

1A: the eye is formed by a circular line and then the line to either side is added after this, cutting through the line. Continuous line forming the head and around the chin. A line makes a correction to the shape of the face, likely a later addition. The details of the mouth have likely been added after. The line continues to form the ear at one end and gives the shape of the neck into the chest at the other. The lines of the back and neck do not cross the first ear but they do cut the second ear. Possibly this suggests lines to the right are earlier than lines to the left. The extra ear doesn't make anatomical sense and this arrangement of lines may suggest a second animal stacked behind the first. Line of the back is later than these diagonal neck lines, except for the furthest to the left which was added later. The deeper lines that suggest fur along these lines and line of the back are likely later additions and cut through the longer lines. Some are composed of 2 closely spaced and parallel lines rather than a single line.

1B: the lines of the back is made with 2 closely associated lines that sometimes run into each other. This may be stacking and could be indicative of another animal behind the first, as suggested by the ear. The line continues over the edge to form a tail which runs down and terminates at the top of the rump. These lines are both cut to the right near the neck by deep vertical lines suggesting fur but only the outer most line is so cut towards the left.

1C: the line of the chest are composed of an initial line with some evidence of returning to the top to re-draw this. At the base of these lines, it splits into a cluster of lines, suggesting fur, linked perhaps to seasonality. The inner detail of the lines inside the outer lines cuts this cluster of lines, suggesting the inner detail is later. The lines of the legs are deeper than those of the chest. The upper and lower part of the leg are each made with a deep curving line, the top was made before the bottom of the leg. The hoof doesn't connect but is formed around the lines of the leg suggesting it is later. The line of the front of the railing leg cuts through the line of the back of the leg. This back of the leg was likely drawn top to bottom to join into the hoof. The trailing leg was also likely drawn in the same order. It is probable that the line of the belly cuts the back of the trailing leg. The hoof is much less detailed in this second leg, no clear detail to the hoof, just a change in angle of the lines to incorporate the rough shape. The line of the back of the animal in opposite orientation disrupts the trailing leg, suggesting it is later. The lines for the front of this animal disrupt the belly of the animal, supporting the same interpretation. The fur inside the lines is depicted later, some of them cutting across the lines of the belly. Multiple lines used to

create the belly that run through the back of the legs. The back of the legs of the animal that is bent around in opposite orientation also cuts through the belly line.

1D: the background leg may be cut by the belly line. This could suggest he leg was in place first or the belly has been retraced. The foreground leg looks to cut the line of the belly. The hoof of the background leg looks to have been subject to some damage. The arrangement of the hoof is similar to that of the front leg as described previously. The legs have been used twice in different orientations for this animal and the legs of the animal in opposite orientation with legs turned at an angle. Given the more irregular anatomical position in this latter orientation it is more likely the latter is later and made to fit the former. The line of the front of the animal in the top corner may just cut the leg, suggesting it is later.

1E: some signs of termination linked with the working of the rump from bottom to top in association with reworking the line to enhance the foot of the turned around animal in opposite orientation. Line of the tail cut by line of the rump. Likely worked down from tail, into the rump, down into the leg. The finer lines within main lines likely later – some cut into the line of the rump.

2A: line of the top of the head first which curves under with increasing pressure to give the deep line of the mouth. Line of the chin then drawn as a new line at the point where the line curves to give the mouth. Eye and nose likely added later. Nose a single slightly curved line that doesn't connect. The eye has a line above the eye that connects to the top o the eye. Eye a gentle curve starting from the top from the top and drawn anti-clockwise. The line of the head has been re-drawn – 2 closely converging lines giving the forehead. The line connects and forms an outline for the entire head. The ears and horns are added later, the detail of the ear obliterates the line of the head. The front horn is the background and is only suggested, the foreground horn is more detailed. The ear has been cut by a later line that is likely modern damage. The line of the neck continues in a gradual curve into the body. A line cuts this and breaks away at a sharp angle giving the line of the back and the impression the animal is turning around.

2B: line of the back worked from right to left. Several lines form the back. The line doesn't quite run to meet the head and mouth of the additional ibex in same orientation.

2C: (refer back to previous animal (1) to augment this discussion). Confirmation that this animal is later. The anatomy is fitted awkwardly into the space available and incorporating the legs of (1). It is probable they were worked from right to left, following on from the chest. Line of the belly cuts the hoof/leg, suggesting it was drawn later.

2D: fine longitudinal present within the outer lines. Long and fine and they may be suggesting the fur of the animal. The line of the back is very fine and light towards the back leg. The back leg is much deeper by contrast and likely overlies the line of the belly, suggesting it was later. The background leg is only suggested by a fine curved line to give the bend of the leg at the knee. It likely was drawn after the foreground leg to match its scale and follow its orientation. The leg is again cut by the line of the later, deeper marks running in a pattern across the surface. A series of diagonal parallel lines likely depict fur at the upper portion of the leg. The leg clearly cuts the belly of (1) here, demonstrating it is later. There is no back hoof, the hoof stops at the meeting point with belly of (1). The back leg looks to have been drawn and shaped with several lines. It is possible these were drawn in opposite orientation. Compromise on the shape of the rump to accommodate the chin of the additional animal in the same orientation. A line projecting around the face could be a tail? Relationship with lines for front leg of other animal in same orientation ambiguous due to ink but likely that the trailing animal came after (2). (2) could be younger based on working around the mouth of (3). This is the more likely option. The tail is finished with a line running from the top of the mouth.

3A: lie of the hand first. The ear is incorporated rather than 'cut off' as in (2). A finer line is used to give the ear in the background. An eye is present but this is quite faint. Simple oval in design. The snout is quite angular and has been executed with multiple lines. The line of the neck and chest runs down and contacts the belly of (1). Suspicion the belly of (1) has been re-cut to enhance and may mess up line order. Probable that (3) is after (1) and chest was drawn top to bottom. Some fine diagonals may be cut by this line.

3B: line of the back drawn from top to bottom and where the line begins to curve in it looks to cut some of the belly lines of (1), suggesting it is younger. Much of the inner detail respects the line of the back but a more dispersed series of diagonals in opposite

orientation may have been cut by the line of the back. These lines are likely depicting the fur along the back of the animal.

4A: line from the background ear to the tip of the nose, re-cut to alter the shape of the face, a small line added for the nostril, likely later. This sharply cuts back in to give an open mouth and a sharply pointed chin cutting under before bulging under again for the neck. The line approaches the back leg of (1) but its relationship is unclear. Either the line doesn't cross or is too faint or the area may have been eroded. As these depictions are partial, they are more likely later. An additional line would give a more realistic neck line and the beginnings of a leg, possibly merging into the back leg of (1). The line of the back is made up of closely packed vertical lines suggesting fur. A line for the back may be present and rapidly terminates – this could just be more recent damage. Eye is present though is almost completely eroded. Simple circular shape and cut by a long, fresh linear that is almost certainly modern damage.

5A: likely follows (4). Line of the head into open mouth with nostril and eye added later. The ear is formed from the open mouth of (4). A sharper line meeting the chin of (4) may be a horn or a less well formed horn. This looks to cut the line of the neck of (4), confirming it is younger. Very faint lines may give some suggestion of a neck line for both the back and chest. These were likely executed after the head itself – the chest line of (5) may cut the back leg of (1), suggesting both (4) and (5) are younger than (1). Deeper detail running across the flank of (1) seems to cut everything, suggesting this was the last detail added to the piece.

Plaque no. 663:

1A: head is missing due to a recent excavation break. A series of parallel lines give the suggestions of the neck as it curves down towards the line of the back. A fine line marking the back of the neck is cut by these diagonals, suggesting they are younger. A natural crack has been enhanced in the making of the back. The line runs on past the fissure down towards the tail. A line below this runs across the inner surface of the design and may run on towards the front limbs. Where this line curves around to meet the line of the back it may cut over the groove where the lines meet. More difficult to tell in this case due to shallow depth of engraving and high quantity of sediment on the surface.

1B: the line of the back and rump is composed of a number of lines employed to change angle and give a roundness and flow to the rear. These are fine and a little hap-hazard. A series of short, fine cascading strokes are used to give the top of a bushy tail, almost certainly drawn top to bottom and left to right. These seem to branch and terminate in a joining point on the piece and a line that carries on to the edge with no room to join with the bottom of the tail. The bottom of the tail also has 2 terminations. The line of the tail looks to come before the line of the rear of the back leg. The tail is made in much the same fashion as the top side but there are some longer strokes. Note, as not all lines connect, the leg may still have been drawn first and the connecting line for the leg and tail drawn last to unite the 2 elements.

1C: the leg has likely been drawn from top to bottom and from front to back. A fine line starts deep into the body and is cut by a deeper, curving line giving the bulge of the thigh. This line cuts the line of the belly suggesting the leg is younger. A linear line doesn't quite meet but runs inside this curving line to give the lower portion of the limb. This line runs to the point of a natural fissure where it terminates and a new line continues the leg in a different orientation. This line is partly obscured by sediment but another line seems to cut inside again running down from a finger. The fingers were drawn from left to right, top to bottom. Partly covered in sediment. The line of the back of the hand doesn't contact the finger. Most likely, the hand was completed, the back of the leg was started from the top and a final line skirts around the hand to finish the piece. The strokes of the back of the leg confirms this. The bulge of the thigh is depicted with a more feathered line before a new line, deeper and more linear, gives the narrower part of the leg. The 'elbow' is depicted, curves and other lines takes over below into the hand where the line curves sharply to encompass the hand.

1D: difficult to see the contact between the back of the front leg. Area is partly covered by sediment. More likely the belly is after the front leg. The front leg has been made from front to back and top to bottom. The shape of the chest may be a miscalculation – it looks almost breast-like, or it could be intentional, perhaps supporting the view that the piece is part human. Line of the belly has been drawn left to right with multiple lines gently curve to give the shape of the chest and abdomen.

1E: arm likely starts at the top and front and runs down in a long curving line eventually into fingers, the lines of which converge and run beyond. These lines break the line of the neck of a possible horse suggesting this piece is younger. 2 curving lines cut the front of the arm but can't be tied in to the broader design, likely due to breakage, suggesting these lines are a detail added later. Some fine diagonal lines, similar to those seen on the top of the neck are present near the break and may be associated with the depiction. No cutting lines so can't be entirely sure.

2A: a solitary foot is present [or is it a fortuitous product of the outline of 3?] which doesn't seem to connect or cut (1) in any way. It is partly disrupted by recent excavation damage. The hoof looks to belong to a horse and has its toe pointed. The piece starts from the top and front and gradually curves under to give leg and hoof. A line from the point of the hoof travels up and left and is slightly curving to give the base of the hoof. A fine line gives the back of the leg and at about mid-point between leg and hoof a series of curving parallel lines are added in (likely top to bottom, left to right) to finish off the hoof.

3: possible horse is likely real. The arrangement could feasibly fit the suggested by Sieveking though it is more different to the head. The back would seem to exploit the curvature of the support to give shape of the animal. The extra line described for (1) near the back would here be the belly. The foot (2) is a foot but also the gap between the tail and the rear of the back leg. Front and back legs are both confirmed.

3A: line of the neck looks to have been drawn from left to right to match up with the arch of the raw material. Difficult to tell line order where it crosses the back leg of (1) but it looks like (1) cuts through (3), suggesting (3) is older.

3B: the tail looks to have been drawn from top to bottom. The leg is drawn from top to bottom, as is the inside of the tail. (2) has been described upside down! Could just be fortuitous. A heavy line disrupts the leg and the hair to the back of the leg – younger than the horse. Too much sediment around front leg to tell line order. Belly likely drawn from right to left. Again difficult to see the rear leg line order. Belly almost certainly right to left. Back leg does cut through belly lines. Likely chest first and then front leg for the front (front leg, belly, back leg). This latter case is difficult due to presence of sediment.

Plaque no. 664

Correction line of the belly before the fine detail of the hair. Line of the tail and back all one line. The tail is composed of a series of deeper lines that give the basic outline and shape of the tail. These are embellished to a greater or lesser extent with finer lines at shallower angles to give the impression of hair. The 'arrow' running into the belly is old. It cuts the line of the leg/belly, suggesting the outline was in place first but is cut by the finer hachure lines of the fur, confirming it is older than these.

Plaque no. 665

The horse at angle – the belly has been drawn around a natural rise in the raw material, giving a more dynamic and 3D effect. The breaks that disrupt this is old. All breaks look old apart from the crack running along the fault in the piece. Water action has modified the centre but decoration cuts over the top of this.

1A: design has been disrupted by break. Line of the back of the animal below the tail cuts the tail, suggesting it is younger. The initial tail may be a mistake or could be from another animal entirely – difficult to say either way due to the breakage. The tail was likely drawn from the broken edge side first. The lines converge at the tip but then part again to give a tail that branches apart again, diminishing realism. The top line looks to have been produced before the bottom line.

2A: line of the back of (2) cuts (1) – certainly younger but not clear if it is part of the same design or not. The line of the back curves into a tail but this rapidly becomes challenging to see as the engraving is fine.

2B: line of the belly disrupted by break. The line of the belly meets the line of the back. Difficult to see the intersection but the belly is likely cut by the leg.

2C: line of the leg runs down to the edge of the piece. The background leg is also depicted and this looks to be after the foreground leg. Very faint but it may cut the line of the foreground leg. Lines of the leg drawn first and the embellishment of the hoof drawn after. Both lines look to have been drawn top to bottom.

3A: the head of the horse partially relies on natural surface topography for its visual effects. The back of the neck and the head curve over the edge of the piece, this may ridge essentially acting as the line of the neck and head. The ear and mane cut across this feature, confirming its purposeful inclusion. The eye and nostril also look largely natural. The line of the face and nose have been added, likely in that order.

3B: the lines of the neck then moves right to left into a depression caused by water action and breaks off into two, giving belly lines. The deep depression may have been used here to give the underside of the chin with the lines giving the join of the head with the neck. These lines terminate in a crude hoof. Heavy sediment in this region makes it difficult to interpret. The front of the leg was likely drawn first with the line hooking under to give the bottom of the hoof. The rear of the leg looks to follow and overshoot the contact with the hoof, cutting it.

3C: belly line looks to have been drawn right to left. Several deeper lines start to mid-way along and are shallower to the left than the right. The connection between the belly line and the leg is disrupted by the recent break in the raw material. The lines here are also ambiguous as they are full of sediment. Line order between areas can't be convincingly established. There looks to be a large number of lines here that are used to suggest hair. More probably the line of the leg cuts the line of the belly.

3D: multiple lines used to make the legs, both the front and back legs. The leading leg is the background leg. The line of the leg terminates and a short curving line is used to connect the leg with the hoof. Front of the leg likely drawn first, curving down and hooking under to form the hoof. Then back of the leg finishing off the hoof to the rear. The top of the foreground leg looks to cut the line of the belly. The background leg was drawn before the foreground leg. The front of the foreground cuts the fine fur of the back of the background leg.

3E: the line of the back skirts along the edge of the piece, incorporating the top edge into the design of the animal. The back of the foreground leg curves up and around to give the inside of the tail. Probable that the back leg was drawn first and the tail last of all. The back leg has a main line that has been embellished by further fine lines at a shallower angle to give hair.

The reverse has no decoration, has possibly been eroded by water and may have been subject to heating. Some of the lines on the surface look like heat fracture marks.

Plaque no. 666

Almost certainly has red ochre across the piece within the lines (looks like it could be sediment under the scope). Design likely disrupted by breakage – old.

1A: line of the belly disrupted by a break. This line curves and terminates giving the inside of the leg. A line giving the other line in next running at an angle, in turn cut by a line which finishes off the original leg. The leg groove is wide, likely composed by several strokes. [it should be noted that the engraved lines are relatively free of sediment – edges show no sediment].

1B: the back/rump has been formed by 2 closely packed grooves, each composed of multiple strokes. Disturbed by the break. The top lines continues on around to overshoot the leg which is then finished in the start of a horses tail. Bottom lines terminate before this and doesn't seem to join anything.

1C: line of the back joins up with the back of the tail. The inner side of the tail joins the back of the leg. The tail looks to cut the top of the back of the leg, suggesting the underside of the tail was drawn after the leg. The inner line seems to gradually migrate towards the outer line of the tail, suggesting the inner line is younger than the outer line of the tail. They don't seem to actually meet.

1D: the line of the leg has been drawn top to bottom and the line is similar to the others with internal microstriations. Finer lines to the rear of the leg cutting the main line of the leg suggesting they are older. A small joining line may have been used to join the rear of the leg and the tail. Several strokes used to compose the leg.

There are some finer diagonal lines within the outer frame of the animal. These don't appear fresh (partly filled with orange/red substance, likely sediment) and so could possibly be fine detail. Could the projection near the leg be a penis rather than the background leg? All of the legs look to be old but at least some of them were after decoration.

Plaque no. 667

1A: it is likely that the head was drawn on first and that the line of the back was drawn around to fit in with the position. Several fine lines radiate out towards the edge of the piece and this likely gives the mane. Hard to be sure of the line order as there is no connecting line. An eye is present but, similarly, line order is difficult here as it doesn't seem to connect. A line may form the other side of the face of the horse, however this is natural and it is difficult to be absolutely sure. The front of the face is made with 2 main lines and seems to terminate at the edge of the piece where a prominent piece of rock is used to finish the head. A natural line looks to have been embellished to give the lines of the head. Intersection of head and neck/back not clear.

1B: line of the back looks to have been drawn from left to right. Several strokes used. The line of the back curves around to give the shape of the rump. A line cuts this and runs off in a curving arch towards the right edge of the piece. This could be an abandoned tail that was placed in the wrong position? This line continues for a considerable distance and becomes increasingly fine, with an additional line branching from it.

1C: the line of the tail runs out from the rump and the two lines of the tail stay parallel and converging along the length of the lines. This gives a narrow tail before the lines begin to part again. Several additional markings below the main lines of the tail likely represent its continuation before a tight, elongated 'v' shaped arrangement brings the tail to an end.

1D: legs and rump appear to have been made from top to bottom with a series of deep, short, curving marks that produce the desired body element when taken in together. Front foreground leg likely drawn first, the line of the background leg following its shape. The hooves are not present, instead the lines of the legs run on and leave open stumps. The vertical line of the back leg was likely produced first, then a hooked line added to give the suggestion of the belly. Line of the leg added first, penis cuts this line and the top line of the penis looks to have been made first. The upper portion of the legs look to have been made with longer, more confident strokes, while the lower portion of the leg has been made with shorter, deeper, choppier marks.

1E: line of the belly worked from left to right. Some touching up to the left side may be from right to left to join up with the leg. Lines of the leg cut by lines of the belly. More likely left to right working – starts narrow to the left and fans out to the right. The back of the belly doesn't join directly with the line of the back leg. Instead a line just out and steeply curves back under which looks to cut the line of the leg. This would use the upper line of the 'penis'.

1F: the line of the chest may have been designed to connect to a natural fissure running through the piece which matches quite well with the line of the front leg. However, a different line for the belly has been drawn which leaves a significant mismatch between line of the chest and line of the belly. Line of the chest was drawn before line of the legs, the latter cutting the former. Strangely, the line of the chest runs on and cuts off the legs. [the lines of the back of the legs may be an attempt to depict furriness and suggest hair. However, a lack of internal decoration to the piece perhaps suggesting it is simply a lack of skill in depiction]. The background leg is in front of the foreground leg and cuts the line of the belly/chest. The leg is drawn from top to bottom. The back of the background leg looks to cut the line of the front of the foreground leg. The foreground leg curves towards the bottom of the leg leaving a gap between the back of the background leg and front of the foreground leg. The back of the foreground leg is clearly drawn from top to bottom with heavy deep, short lines. Again, no hooves are depicted, the legs ending in open stumps. The back of the foreground leg ends in a double line running in parallel.

Confirmation of some random anthropogenic lines to the bottom edge that don't seem to be connected to the main design. The piece was decorated before burning.

Plaque no. 668

1A: there looks to be stacking around the front of the head. Several lines at different angles may point to the attempt to depict a head. However, the broader body plan only really depicts the single animal, perhaps suggesting this could just be multiple attempts to depict the head. The connection between the head and the neck is not clear. There also appears to be little in the way of connection between the bottom of the head and the neck, leaving the head free-floating.

The line of the face closest to the edge was drawn from left to right with 2 strokes. It doesn't connect with any other lines. A heavy sediment load makes line order of the head difficult. The ear and front of the ear seem to be a single line while the back of the ear is a distinct line. Likely drawn from top of the ear down. A delicate eye has been drawn, roughly elliptical in shape and drawn with 2 lines. The nose/mouth is made with another line that curves around sharply and gives the underside of the jaw. This line 'kinks' at its termination to give the connection between the jaw and the neck.

1B: the line of the top of the chest is heavily laden with sediment. A line breaks off from it, and looks old, but line order can't be established. 2 lines project out and seem to run in parallel gradually turning and contacting the right edge – this may be a leg? Leg likely drawn from top to bottom. Leg likely drawn before the upper line of the belly. There is a lower line for the belly and this seems to be a later addition, cutting the first belly line and some further vertical lines that may be hair/fur associated with the upper line.

1C: line of the belly is made up of several lines and goes from shallow to deep left to right. Likely worked from right to left. The line of the belly seems to cut some of the lines/fur around the back leg suggesting the belly line came after the leg lines [this arrangement would make more sense the other way around].

1D: a very deep line has formed the front of the rear leg. This is composed of multiple lines and likely runs from top to bottom. 2 lines finish off the front of the leg running closely together in parallel. They reach a break in the raw material where fine lines change the angle to give the hoof and 2 lines form the bottom of the hoof.

A line within this arrangement breaks off at a different angle and is completed from top to bottom with several dashes, likely giving the background leg. The rear of the back leg is composed of several lines, drawn from top to bottom and more delicate than the front of the leg. This line also terminates at the break near the bottom of the piece. Much of the vertical lines within the outline of the design likely depicts fur, are drawn in parallel from top to bottom.

1E: the line of the back/ rump is extremely faint. It seems the line of the back leg terminates to leave an opening between the back and the leg for the tail. The tail is

composed of numerous long, even, parallel lines rather than an obvious outline. The direction of working the back is likely right to left. Back likely worked before the tail and perhaps leg before tail. No connecting lines. May be a few lines that suggest the mane but these are indistinct. Lines for hair likely depicted after the main outline.

Plaquette no. 669

1A: the line of the nose is composed of 2 deep and evenly spaced parallel lines. Probable direction of working from right to left. Deep angular points near the ears perhaps supports this interpretation, being possible origin points. The ears were drawn after this set of lines, clearly disrupting the parallel face lines. These lines connect with a joining line to the left side.

1B: multiple attempts to draw the front line of the front ear. Direction of working is from top to bottom, cutting the line of the face. Multiple lines may suggest the rear of the ear and it looks to have been drawn to 2 sizes, a smaller and longer more curved designs. Additional lines projecting from this arrangement can be attributed to depiction of hair. The foreground ear is broad and large. It has been drawn from top to bottom to the left side but the right side is made up of several lines that converge on a deeper line that starts the sweeping curve of the ear. The additional lines around the ear start away from the piece and run towards it.

1C: the eye is made with a line that runs from deep to the back of the eye to the right, through into a sharply curving line that cuts back underneath itself. A faint line runs below the eye, joining a natural inclusion that may form the eye. The jaw may well be depicted but is very fine. The line of the jaw is made with several non-continuous lines, likely working from left to right, terminating in several feathered lines that may be hair around the back of the chin/jaw.

1D: the line of the neck and chest is drawn from top to bottom, and as with the face 2 parallel lines have been used. Some finer lines appear to the inside of the design and they eventually join a network of lines that marks the transition from neck to chest. The lines forming the chest are wider with more internal microstriations, largely working from top to bottom. Some suggestion of these lines cutting the lines of the neck suggesting they are later.

1E: a series of fine, relatively even spaced projecting lines form a mane and suggest the line of the back. No evidence of a line for the back being present. It is probable the head was depicted before the neck and the neck was fitted to the scale of the head.

Plaque no. 670

Several stacked horses. Piece looks burned with 2 old breaks, still quite angular.

1A: line of the back of the ear curves around into the line of the face which projects slightly around to the edge where it meets the line of the muzzle. The front of the ear runs down and cuts the line of the face. A line cuts across this long ear shape. This would leave the ear in much more realistic shape. An additional line below this may form an additional ear, smaller still. A long, curving line cutting through the ears and getting deeper towards the edge where it is disrupted is cut by the line of the jaw and neck of (1), suggesting this line is older.

1B: the line of the face projects over the edge. It may join at the line or below the line of a second mouth belonging to another animal. Numerous fine lines are then used at a shallow angle to give the shape of the jaw. These lines cut a deep, sweeping line that may be part of another animal.

1C: possible line of the back running just left of a ridge and steep break in slope where a series of closely packed parallel lines project forward to give a mane. Some lines of this nature cut across the line of the back but the broader set could be part of a different pattern. These lines of the mane could be using the crack as a point to guide and shape the mane.

Double line above head 1 may link in with the ears arrangement. This line cuts an additional head below it that was likely there first. It may also connect with the deep curving line cut by (1). This head also connects with the extra muzzle identified during analysis of (1). More challenging to interpret this piece as the lines are very worn.

Plaque no. 671

1A: the shorter neck with head in tact looks to be the original, with the additional head and neck being grafted on at the bend of the neck. The head was likely formed with lines

continuing from the neck. A line starting at the top and back of the head curves around the eye. An additional line finishes the top of the break. The bottom of the break is similarly an extension of the neck and joins the top line at the break. The head of the second bird has been removed either as a pot lid or excavation damage. It is directly proximate to some excavation damage. The line of the back has been disrupted by a pot lid.

1B: the line of the back runs on a small and slightly lower shelf before being disrupted, suggesting a smaller break was already present. The line of the wing is similarly affected, confirming the potlid is later.

1C: general sense of working from head to tail. Tail feathers worked from right to left and top to bottom. The leg is worked from top to bottom. The leg is worked from top to bottom and has a rapid change in orientation, perhaps suggesting one of the legs was outstretched. The leg has been lost to a heat fracture.

1D: the wing was likely drawn from right to left with a continuous sweeping line, somewhat disrupted by a natural inclusion (mineral vein) and by a pot lid. It continues to the other side of the pot lid and some of the feathers near the tail may be linked to the wing. Agreement in the necks of the birds of working from right to left. The design looks to have been well fitted to the raw material. No signs of any further decoration across the surface. Some remnants of the second head remain but it has been almost entirely obliterated. Back line of the leg looks to cut the line of the feather at the bottom of the line of tail feathers.

Plaque no. 672

1A: line starts at the top of the face and progresses down and around to give the chin. A branching line from this one gives the line of the mouth. The line of the chin may well be cut by the line of the neck but there is too much ink to be sure. Position of line supports this but can't see line details. The horns were drawn after the front line of the head but before the back line of the head. An extra head seems to project out from the horns. The eye is formed around a natural inclusion but there is modification.

1B: the line of the back is worked from right to left with multiple lines. The lower lines of the back is primary, followed by a higher line which likely links to a projecting face stacked

behind (1). Numerous lines depict fur and these are worked from right to left. Line of the back continues right to left and fur has been depicted, likely drawn over the top.

1C: the legs seem to be drawn from the top to bottom after the rear. Legs drawn from front and top. The foreground leg looks to have been drawn first, with the background drawn afterwards to fit the scale of the background drawn afterwards to fit the scale of the outline. Confirmation legs are drawn from top to bottom. Line of the top and front of the background leg cut by the line below.

1D: the background leg meets the line of the chest and runs down into the hoof. In this case, the line of the foreground leg is made after the background leg, perhaps because the background leg is the leading leg. It is possible that the back of the background leg was made after the front of the foreground leg in this case, again to aid with scale and accuracy of depiction. A patch of ink is too dense to be able to tell if the fur around the 'shoulder' of the back of the front leg was before or after the line of the leg. Again, ink around the leg with lines cutting across this is again too dense to be able to tell line order. More likely right to left. Microscopy across lines does confirm right to left working along the belly.

2: small animal below (1) – head and front leg have been inked, the back leg may be lost in the rump fur of an animal stacked behind the sitting ibex and the line of the back hasn't been inked. Line of the back confirmed under the microscope and the line of the belly and other leg also visible macroscopically.

3A: 2 heads have been drawn and again this may be an attempt to depict multiple animals. The order of the two is ambiguous due to the presence of ink above it. The second head would shorten the length of the neck and perhaps add some realism. This could be a correction but is more likely an attempt to stack images. The eye of head one has been made with 4 lines and makes a relatively square shape. The eye of head 2 is longer and rounder. Ink obscures the lines of the front of the neck but probable direction of working is top to bottom.

3B: line of the belly cuts the line of the back leg to the front of the body, suggesting the belly was drawn after the legs. The line of the foreground leg has been drawn first, giving a relatively straight line all the way up to the neck. The background leg has been drawn after

a line emerging high up the neck/chest to give a leading background leg. Direction of working is difficult to establish due to the presence of ink but it was likely from top to bottom. The back of the background leg looks to cut the line of the foreground leg. The hooves are cloven and drawn top to bottom, outside to inside, with curving lines to give the projection of the hoof. Gut instinct would be they drew the belly after the line of the leg, but given the shape of the raw material and high quantity of ink it is difficult to be completely sure.

3C: the belly has been made with several lines moving from right to left. The line has several lines stemming from it about 2/3 along its length. The belly cuts straight across this region and so the penis (?) was added later. The lines converge but don't meet, instead 2 additional lines break off at a different angle. The line of the belly looks to be cut by the line of the rear leg to the back of the animal, suggesting the order of front legs, belly, back legs.

3D: several lines have been used to give the line of the front of the foreground leg. One breaks off in and looks to have been abandoned, now encircled by the actual leg. The background leg doesn't seem to join the line of the foreground leg. However, the back line of the background leg does seem to contact the foreground leg, cutting the front line, suggesting the background leg is older. The background leg has been fitted to the shape, size and position of the foreground leg. It is probable that the legs were worked from top to bottom in each case. The top of the foreground leg has been drawn in 2 ways, a wide line flows and connects with the shape of the rump, another line narrows the leg and makes it more dynamic. The narrower arrangement looks to cut the wider arrangement, perhaps suggesting a correction.

3E: the line of the neck was likely worked right to left, more feathered lines to the base of the neck and a straighter line for the back. The marks depicting fur at the shoulder look more 'u' shaped than 'v', suggesting they may have been worked with a single line from a single direction. They are almost completely full of ink so difficult to be sure. The working of lines of the rump showing fur were likely drawn right to left. Ink obscures the relationship between the rump and the back of the leg. More likely the rump was drawn first? Also difficult to as the rump is not a solid line making it more difficult to assume the same relationship all along the back.

4: confirmation of the presence of an uninked horse in the top corner near the head of 3. The tail of 4 cuts through the face of 3, suggesting the horse is later. It has been depicted with one hoof. The front leg ending in an open stump. [this piece is much more clear on the model than the real thing].

4A: the rear leg looks to have been drawn before the line of the tail, the latter cutting the former. The tail looks to cut through the line of the face (3), suggesting the horse is younger. It doesn't respect and merge into the design, and is stylistically more competent, perhaps suggesting a different author and that it isn't part of the main composition. The back leg looks to have been worked from top to bottom. The rear leg has a hoof.

4B: the line of the belly goes from deep to the right to shallow to the left, suggesting this was the probable direction of working. This line is almost invisible under the microscope. Can it be assumed the front leg was drawn first and the back leg was drawn after the line of the belly? Note, there is no clear evidence of background limbs either to the front or back.

4C: confirmation that the lines of the front leg were drawn before the belly. The line of the leg cuts through the back of (1), again suggesting the horse (4) is younger than the main composition. This perhaps does confirm that the other pieces were drawn together as a composition. It is probable that the line of the neck/chest was drawn before the line of the leg.

4D: probable that the head was drawn before the line of the neck. The head has been depicted with hair around the chin. The horse is difficult to see – it is likely the top of the head was drawn first and then the finer detail of the hair was later. The back of the neck is a separate line from the head. Again, it is probable this was drawn from right to left and followed the head. Some short lines across the line of the neck depict the mane and this was added after the line of the back. The crack running through the back of the horse is likely a later feature, disrupting the line of the back.

There are actually 2 animals on the bottom panel, the less complete animal seemingly relying on the shape of the foreground animal for some of its shape and definition. To the

front of (5) (primary animal in this zone), another long neck and beginnings of the legs looks to have been depicted.

5: it would make sense if the head and neck/chest/back were drawn first and then the error of size vs. space wasn't fully realized until the legs where the quality of depiction has been compromised to fit in the rest of the design. Note, due to its position and the steep angle of the piece, it is extremely difficult to use microscopy – microscope is largely physically inaccessible, using it primarily to tell the relationship with other depictions.

5A: it looks like the head of (5) may have been drawn after the line of the neck of the animal in front of it (6). The line of the underneath of the head is cut by the line of the neck, suggesting the former is cut by the line of the latter. There are 2 lines to the neck. The original line seems to be relatively narrow. Additional lines have bulked out the profile at the shoulder and the chest. It seems probable that the neck was drawn first and these additional details were added after. The curving lines at the shoulder do seem to cut the lines of the neck as they turn into the back.

5B: the line of the chest doesn't contact the line of the neck but as evidenced at the shoulder, the neck seems to have been drawn before and the body and it is probable that this was the case with the chest. The front leg cuts the line of the chest, suggesting it was later. A sweeping line of the leg gives little anatomical realism and seems to be a compromise with the limited scope of the raw material. The points of the hoof look to continue from the same line as the front of the front leg. The line of the back leg curves off and doesn't join the main arrangement. The back of the leg looks to have been disrupted by the line of the belly, suggesting the line of the leg was drawn first.

5C: the line of the belly gradually curves before changing angle sharply to depict a penis. The line of the front of the penis disrupts the line of the belly to suggest these are different strokes. The other side of the belly was worked left to right to join and make the back of the penis. It also looks to disrupt the line of the front of the back of the leg perhaps suggesting at least part of the leg may have been drawn first. The back of the penis may have been drawn before the line of the belly, with the line of the back of the belly being used to join the line of the leg and the complete penis.

5D: the back leg looks to have been drawn from top to bottom. At the curve of the leg, the 2 lines merge and the limb is lost. Simply depicted by a single line. These begin to separate again to give an exaggerated hoof. The hoof is in a similar arrangement to the front leg but even more exaggerated. There looks to have been some recalculation of the limb with the line of the back of the leg being too high leading to an extra line to give the full extent of the limb as it curves under the body in a sitting posture.

5E: the line of the back was likely worked from right to left with the shorter curved lines of the rump also worked from right to left and top to bottom. The lines running through this arrangement are too full of ink to gain a sense of line order. However, the line of the back may well cut the line of (7), suggesting it is older than (5).

Plaquette no. 674

Lines are dense and cut across the surface, obscuring the horse design. Some suggestion the head has been fitted to the shape of the piece. The tail looks slightly raised in the horse design. Some of the small weathering holes are disrupting design, suggesting they are later.

1A: very difficult to pick out the design of (1) as there are so many lines cutting across this region. It looks as though the line of the chest is cut by the line of the legs, suggesting the legs were completed after the chest. The line of the bottom of the head and the front of the neck don't connect. The line of the head curves around to give the shape of the jaw. Similarly, the line of the back does not connect with the line of the head. A series of lines depicting the mane fills the gap between. Extremely difficult to analyse this region as the topography is extremely uneven and the engraving is dense.

1B: both a foreground and background leg are depicted and these are likely depicted after the chest. The background leg is leading and seems to be composed of only a single line. The foreground leg has a front and back but doesn't have a hoof, instead the lines gently converge. The lines cutting across the legs seem to be younger than the horse itself.

1C: the line of the belly is extremely faint and seems to be part of a broader sense set of sweeping lines running across the surface and seems to link up with the background leg rather than foreground leg. It is probable the background leg was drawn first and the foreground leg fitted to it. Note the lack of broader upper leg/body detail in the upper

portion of the front line of the foreground leg, perhaps supporting this. Hooves are present, more simplistic in the background leg but detailed in the foreground leg. Legs were likely drawn top to bottom and the hoof was drawn in 2 parts – the front portion with the front leg and the back and feathers with the line for the back of the leg. Note, a line has been drawn down to the hoof cutting off the feathers, so the feathers could be the last step in creating the hoof.

1D: the line of the tail is connected to the line of the back. The bottom line of the tail is cut by the line of the leg, suggesting the tail may have been drawn completely in association with the drawing of the back.

2: large horse in opposite orientation. It seems to be largely composed of numerous lines for each body element, accounting for many of the lines that so confused the other horse depiction (1). (1) was likely earlier and seems to have been crudely incorporated into the head and chest of (2).

2A: the line of the back was likely drawn from left to right, with a high volume of strokes that give the line of the back but perhaps also the shagginess of the coat. These lines blend in to the tail which is drawn in much the same style, though the lines are longer and more uni-directional. The tail was likely loosely constructed from the outside as the line of the back of the tail seems to cut the line of the front of the tail.

2B: the line of the face stretches to the edge of the piece. It may have been disrupted by breakage or this may be the chosen termination point, perhaps given the position of (1). A series of lines have been used to depict the mane and again there doesn't seem to be any connection between the back and head, with no clear line for the back. A deep line may be an ear and it does give the shape of an ear in this orientation. The line of the chest/neck is suggested by the back of (1) and so it is likely the head of (1) was fitted around these existing lines somewhat.

2C: the working of the tail was likely from top to bottom and from left to right. Likely worked after the line of the back and given how it has been worked it was likely worked as part of the line of the back. It looks like the small holes in the surface are likely present before the engraving – some appear to cut across the holes. The length of the line is

variable with some longer lines interspersed with some shorter lines at different orientations.

2D: the line of the leg is relatively deep and wide, most likely worked from top to bottom. The line of the leg runs right through to the edge of the raw material with no sign of a hoof. It looks like the line of the tail was drawn after the back line of the leg as some of the lines from the former cut over the top of the latter.

2E: there may be 2 clusters of lines to form the belly and perhaps one set could be suggesting fur? Or one may be correcting the other to give a truer sense of scale. Again, this lower group of lines likely came before the back leg. 2 deep lines cut the leg and these lines meet within the arrangement of lines forming the leg. Possible 3rd belly line cutting the line of the leg in this case, suggesting it may be a later addition. Evidence for the dense clusters of belly lines to have been worked in both directions.

2F: the lines of the front leg at the end towards the hoof end seem to have been worked from bottom to top. Some clusters of fine lines above the back of (1) may be the suggestions of fur to the chest. The upper portion of the leg and the chest are ultimately ambiguous. Line of the back of (1) likely acts at the chest of (2), at least in part.

Plaque no. 675

1A: the line of the front of the face was drawn first, then the chin/jaw, followed by the top of the jaw into the back of the head. The head is a peculiar shape and cuts off the line of the neck. This is because the head is a recycled feature with (2), acting as the ear in the latter case. The lines of (1) in the head and neck seem to disrupt (2) and the body plan closely follows that of (2), suggesting the horse is later.

1B: the back is depicted with 2 sets of lines, each giving a slightly different shape to the back. The mane is in 2 orientations perhaps suggesting the area has been re-worked to take into account the repositioning of the neck. If this is the case, the finer, straighter line come first and the neck and back was then made more curved by a deeper line, with the lines of the mane extended down to meet this new line. The mane (and extension) were drawn after the line of the neck in both cases. Direction of working right to left and confirmation along the line of the back the straighter line is cut by the deeper and more curving line.

Confirmation of right to left working through back and into the tail, depicted with a series of short, straight lines to give a curving tail. The inside of the tail is given by what was the tail attached to the line of the first line of the back. The line of the back leg cuts this older line of the back/tail, confirming its old age.

1C: the head was drawn before the neck. The neck is a very deep groove and was likely drawn from right to left, cut by the line of the front leg. The line of the front leg follows the line of a natural ridge/crack in the raw material that may have been used to give definition to the piece and a sense of the shoulder. The lines of the front and back of the leg merge to yield a point rather than a hoof. The lines of the back of the leg cut the lines of the front of the leg, suggesting the front of the leg was drawn first. The line of the looks to cut across the gap between front and back line of the front leg, suggesting it may have been drawn in its entirety first and the full leg added after this.

1D: the belly looks to have been worked from right to left. A straight line seems to cut through the line of the belly before it reaches the legs. The leg was likely drawn after the line of the belly. The front line of the foreground leg seems to truncate the line of the belly. A background leg is depicted by a single line. This doesn't seem connect with other lines but likely was drawn after foreground leg, using it to get the right size and perspective. The vertical lines within the outline perhaps depict fur. Some of them seem to cut the line of the back.

1E: a front background leg is present. This is cut off by the line of the belly, again suggesting the belly line was completed first. The lines of the leg cut the belly and are faint compared to the front leg. Some suggestion from where the front leg and back lines of the leg meet in a point that the front lines come first. (2) is definitely earlier than (1). (2) is fitted into the space around (1) and it is cut wherever the two meet.

2A: top of the head looks to have been worked from right to left into the neck/back, and left to right into the face/muzzle. An eye and nostril have been added, perhaps later than the rest of the design. lines run out of from the chin and curve around the natural inclusion. These could be fur(?) but actually look a lot like upside down ears! The line of the jaw gently curves to give the shape of the back of the jaw. The line of the jaw looks to be cut by the line of the chest that also runs through and disrupts the face.

2B: the line of the chest seems to have been worked from top to bottom, giving the line of the neck before changing direction and giving a deep chest. This line starts narrow but becomes increasingly wide and shallow. The line of the front leg looks to cut a fine line that may be the continuation of the chest. This would make the leg younger than the chest. An additional line appearing left of the back of the leg could be the depiction of a background leg. Difficult to see line order. The front and back lines of the leg also meet in a point rather than a hoof. Difficult to establish line order. More probable that back of the leg cuts front of the leg.

2C: the line of the belly looks to be cut by a line that may be a leg but extends much further into the body. There may be the hint of a second line for the back of the leg but this could be part of another design in a different orientation. The design isn't complete in this zone and may have been disrupted by breakage.

2D: the line of the back is faint and was likely worked right to left. It skirts the underside of (2), is cut by (2) with legs and tail and progresses to the edge of the piece, perhaps disrupted by breakages.

Note, this doesn't account for all the lines. The far left edge has some fringing, a possible eye and some long vertical lines next to a heavily pitted zone. Could this be intentional modification of the source?

Plaque no. 676

1A: a converging 'v' shaped arrangement may be a face. If so, the piece is highly schematic and difficult to see. There is a possible eye, angular and could be natural. If this feature is the head it appears to be cut by the line of the neck/chest which runs down the piece at a relatively straight angle. This is in turn cut by the front of the leg (?), a line which converges with the back of the leg line to give a point rather than a hoof. Lines look to have been worked top to bottom for the front leg.

1B: the line of the belly clearly cuts the line of the background front leg. The front leg was likely drawn after the chest. It is probable that the foreground leg was drawn before the background leg, the latter fitted into the scale of the foreground leg.

1B: the arrangement of the back leg is more challenging. It almost looks like there are 3 legs, 2 of which come together to give a more static pose. A third leg would be a background leg breaking off at an angle, giving a more dynamic pose. This back leg is a later addition, cutting the line of the back leg. It could be a correction or it could be another altogether. The line of the rump joins the line of the leg – same line drawn from top to bottom. The extra leg merges into this line and was likely also drawn from top to bottom.

1C: there may be two tails depicted, again supporting the presence of two animals perhaps? Again, challenging to see here but perhaps work undertaken from top to bottom. The line of the tail that connects more directly to the back of the leg looks to potentially cut the line of the longer tail. This might suggest that the line of the back that hugs the edge of the raw material may be older than the line of the rump/legs.

Below the line of a major fault running through the material there are some additional details. Some of these lines are the extension of the legs from the main design(s). Some deeper engraving around the centre point is likely a more deeply engraved leg/hoof. Not all of the lines seem to connect, or more interestingly, may connect to form a much larger animal. A deep, wide groove running horizontally looks quite fresh but is cut by some lines that may be decorative.

1D: the denser engraved leg forms part of the background leg of the front leg arrangement and likely cuts the foreground leg. It is in turn cut by the line of the belly.

Plaque no. 677

1A: the head of (1) was likely drawn from the top of the head and meets the underside of the chin to give a narrow head. The line of the back has likely been worked from right to left. There may be an additional ear below but this could be the rear of (2). More probably just the line of the leg of (2) and what looks like an ear more probably associated with the tail. Some projecting lines around the neck and head may be suggesting of a mane.

1B: some suggestion of a neck that was likely drawn after the head. This line is cut by lines that could be front legs. These lines seem to meet in a point. The line of the belly is difficult to track across the piece and is only really evident around the lines of the back legs.

1C: the line of the back of the back leg is likely also the line of the front leg of (2). Both lines were likely drawn from top to bottom. The back of leg lines may be united at the ends with a straight line across to possibly give a hoof. The line of the leg seems to extend into a much longer line that curves around and runs right to the edge of the piece along the long axis of the piece. This line of the back/belly of an as yet unrecognized design. There may be an extra horse in opposite orientation – the long angular stray line may be the chest/leg, head formed by rump of (1)? There is also ‘fringing’ to the bottom edge – more designs?

2A: the head of (2) is relatively clear, especially so because of the presence of some well depicted ears. The front of the face was drawn from top to bottom in a series of short and closely packed lines. The underside of the head/jaw was likely drawn from top to bottom to meet with the line of the front of the face. A line depicting the neck cuts the line of the jaw, suggesting the head was drawn first. The line of the chest merges into the line of the rump of (1). A line which doesn’t make sense for (1) could be the line of the chest/leg of (2) (appears to make an oval shape - inner line being part of 2?).

2B: the back leg of (1) is likely the front leg of (2), worked from top to bottom in both cases.

2C: the line of the back has been made with multiple, short dash like lines, most likely worked from left to right, skirting past the head of (1) and moving down into the flank and back leg.

2D: the lines of the legs run on into a crude hoof, more clearly seen on the 3D model. There is a possible branching line suggesting the line of the belly but this is difficult to trace beyond the immediate connecting line. Difficult to tell line order in this instance. Could be from left to right(?) but the connection is ambiguous.

Plaque no. 678

Small, weathered piece, clearly heat fractured to the reverse. Minimally depicts two horses in opposite orientations.

1A: the head is very faint and eroded but looks to be that of a horse. The neck curves underneath the head, moving into a curving line for the chest. The line curves steeply into the animal, possibly being a feature linked to another design.

1B: the line of the chest is faint and difficult to trace but runs down to the top of the foreground leg. A background leg has also been depicted running in front of the foreground leg. The legs have been made with a series of dashes like marks, likely from top to bottom. It is probable that the foreground leg was drawn ahead of the background leg.

1C: the line of the belly was likely drawn from right to left and cuts the back of the of the foreground leg, suggesting it was later.

Note: there may be 2 additional horse heads. 1 may be fortuitous formed by the tail and flank of (1), the other is positioned below this and may have an ear, cutting over the top of (1).

1D: it looks as though the front line of the back leg cuts the line of the belly, suggesting the leg was later than the belly. the front of the leg is formed by multiple lines before it curves gently with a hoof attached below the line of the hoof. Hoof likely drawn after the leg.

1E: the rear of the back leg joins in to the rump and the tail. Difficult to trace the line from the leg up to the tail. Line of the back more visible and confident by comparison. Tail is present but its connection to rump and leg difficult to plot.

2A: the face of a horse in left profile has likely been lost due to breakage. The reverse surface shows signs of heat fracture and so decoration likely preceded breakage. The line of the neck/back and jaw/neck look to have been worked from left to right. Extensive recycling of the rear body plan (1) must be used on this piece to complete (2), if not it is just a neck/head.

2B: the arrangement of curving lines that were implicated in the chest of (1) but which had a sharp branch and cut into the animal would make sense as the rump of (2).

2C: the lines of the leg of (1) to the front are static. This may be intentional to allow them to be reused as the back legs of (2), joining from the line of the chest (1)/rump (2).

2D: a deep line joining to the line of the belly of (1) could be a front leg for (2) with possible hoof depicted.

It is probable that (2) came after (1). However, line of the neck of (1) looks to cut through the possible lines of the rump of (2), perhaps suggesting it was the other way around? Lines of the back of (1) ambiguous.

Plaque no. 679

1A: the markings running across the break where the head was look genuine. This may indicate 2 phases of activity with this object. The break has definitely disrupted design, with numerous lines running over the edge. The deep lines of the neck/back were likely drawn from right to left. 2 parallel lines are used for the neck before the lines rise steeply and turn off to give a steep and arching back, likely suggesting a stretched and bent neck at the shoulder (animal grazing or similar) – this posture may suggest the animal is not a bear as Sieveking suggests. Several deep but finer lines cut through these initial parallels and may be unrelated. They can't be e.g. antlers as this simply wouldn't work anatomically. The surface is densely occupied by many finer lines, many of which may depict fur. Some fringing to the edge may also be depicting fur but is somewhat removed from the lines of the back of the neck – could belong to another unidentified animal? Many of the finer markings look to have been disrupted by the lines of the neck.

1B: the lines of the neck do not connect to the lines of the back. Line of the back drawn with 2 lines, as with the neck, and closely mimics the shape of the raw material. There are many fine lines along the line of the back, pointing backwards (so not horse) as the main lines of the back cut around a hump in the raw material. The lines of the back likely came before the 'fringing'. The line of the back then steeply cuts down and across to work around a natural dimple in the raw material. The connections between the initial line of the back and the sweeping lines that run across the piece and into the flanks is obscured by sediment. However the line of the back seems to run on suggesting the line of the back has been modified with the addition of these later sweeping lines, seemingly to align the piece

more closely to the shape of the raw material and to accentuate the hump and give a more curving profile to the back.

1C: the sweeping lines turn off sharply and prematurely into the body of the animal. It seems here the edge of the raw material is left to make up the rump before the line of the back of the leg is depicted where the raw material sweeps around gently to its short edge. No connecting lines with the back of the leg and so impossible to know the line order for certain.

1D: the line of the leg begins at the top and moves down the leg, composed of several deep lines, each allowing a change of angle to take in the shape of the leg. A line of a tail is evident (underside?) but an additional can't be seen for the top. A finer line below the deeper upper lines may depict the leg tucking back underneath, which would yield a more realistic shape overall given the position of the front of the leg. The line of the front of the back leg is similarly deep and is similarly constructed to the back of the leg, constructed with 2 deep lines, the second line commencing at the major change in orientation of the leg at about the leg. The front line of the leg looks to cut across several lines which may be depicting other limbs and belly, some of which have fine branching lines stemming from them, suggesting fur.

1E: the line of the belly/leg has likely been drawn from right to left and top to bottom, with the finer lines giving fur added after the main line. A high volume of lines run across the piece that may be indicating the belly. All lines for the front legs have been worked from top to bottom. Some of these finer, longer lines run left to right and have been cut by the line of the back leg. The slightly deeper and diagonal lines of the legs look to cut some of the more horizontal lines of the belly.

1F: a 'v' shaped arrangement likely gives the front of the front leg and the arch of the neck, with some fine vertical dashed lines giving a beard to the neck. This set of lines cuts across the outline of a chip to the edge of the piece, suggesting the chip is older. Probable given the arrangement of lines here that the feathered diagonal line is the background leg at the back of the animal. Finer lines run in several orientations around the neck/leg suggesting the depiction of both internal fur and neck beard here. Lines of the front legs look to cut through the mess of finer lines, suggesting the leg was likely drawn after the neck/chest.

Reverse: some lines present to the reverse surface, some of which cut across an old flake. The marks look to be anthropogenic no clear design can be discerned. More recent marks can be clearly discerned by the grey/white colouration. Working of the major group of lines to the centre seems to have been left to right. The finer lines could be a body and these deeper lines could be legs, worked from top to bottom, but there is so little in the way of diagnostic animal features it would be difficult to demonstrate this conclusively. Top line with microstriations was likely worked right to left, the line below it was likely worked left to right.

Plaque no. 680

1A: the line of the neck cuts the line of the head. The head closely mirrors the shape and position of a natural crack to the edge of the piece, perhaps suggesting some features of the raw material have somewhat influenced the design. The back of the neck is made up of mane composed of short lines worked from bottom to top and running in the opposite orientation to that typical for horses. The full extent of the underside is difficult to see. The line seems to form a gradual curve that meets with the line of the front leg.

1B: the front leg looks to have been drawn top to bottom for both lines. They each begin with a deep, short line. They don't seem to meet fully and the line of the back of the leg seems to extend further than the front leg. The line of the belly does appear to meet the line of the belly, with the latter likely cutting the former. A line cuts the belly at the mid point and this is likely the suggestion of the background leg.

1C: difficult to see the meeting point between the belly and the back of the leg. They contact and it is probable that the leg cuts the belly. the legs were worked from top to bottom and converge to a point rather than a hoof. The line of the back of the leg curves slightly to avoid the edge of the piece – perhaps a suggestion the piece was already broken before decoration? Possibly the front of the leg was worked before the back of the leg.

1D: the line of the back looks to have been worked from right to left possibly along its length to give the shape of the rump, possibly the back of a leg, and a tail. The engraving here in the tail and leg is especially difficult to see. This could render the previously described and more clearly visible leg somewhat anomalous. The back of line of this

anomalous line may well cut the line of the back, suggesting it is older. The line of the back leg doesn't seem to meet that of the back, making line order difficult to establish. Given the back is cut by the anomalous leg, it is probable the back leg is also younger than the back.

2: confirmation of the second horse as noted by Sieveking. This piece lies in a different orientation to (1) and don't seem to cross but are similar in formulation and size, perhaps suggesting they are a composition/made by the same person/made at the same time.

2A: the line of the back looks to have been worked from right to left and is perhaps the clearest features of the entire depiction. A line which may be outstretched tail is also depicted but isn't connected to the line of the back. The line seems to start at the edge of the piece and doesn't connect to the rest of the head.

2B: the front line of the back leg looks to be worked from top to bottom and may have been worked in part before the line of the back. As this line runs on beyond the line of the back it may be an existing line that is being fortuitously recycled. There is some suggestion of the back line of the back of the leg but no clear trace of this connecting to the back or the rump. The area looks to be heavily eroded.

2C: a possible line for the belly runs left to right and look to cut the front legs. This may suggest the belly was drawn after the front leg, a rare case of not sticking to the usual body plan depiction order? However, the line may be cut by the line of the back leg. Front legs, belly, back legs enhancing a natural crack/existing line?

2D: the lines of the front leg look to have been cut by the line of the belly. they meet at a point and look to have been worked top to bottom. The line of the chest looks to have been made from top to bottom. It flows into the line of the front leg and an additional line branches off at an angle that may be an outstretched leg, suggesting movement.

2E: the line of the head runs from the top of the head towards the muzzle. This was likely worked before line of the underside of the jaw and neck. These latter lines are relatively clear and look to have been worked from muzzle to neck and then top to bottom on the neck, moving into the chest.

Plaque no. 681

1A: the line of the head looks to have been drawn from top to bottom. How this line interacts with the underside of the head is made unclear by the ink where the two lines meet. The line of the bottom of the head was also worked top to bottom. The point of the nose would represent the terminus of both lines. There looks to be several fine lines running from the underside of the jaw to give the neck, with the head likely to have been drawn first.

1B: the back of the front leg is made from a long sweeping line that cuts across the body of the piece. Part of this is likely to make the depiction more dynamic to give the upper portion of the leg but the line runs yet further. The line may not be continuous and is difficult to see in places. The front leg looks to be connected to the line of the chest by the front of the leg. The front and back line converge to a pointed end rather than a hoof. It is difficult to see but the backline looks to modestly interrupt the front line, suggesting it is older/ there may be another arrangement of 2 converging lines just in front of these that could be another leg, though this is less clear than the other leg.

1C: the line of the belly looks to have been worked from left to right. There may be some modest disruptions of the belly by the back leg, perhaps suggesting the legs were drawn after. It is not clear whether the front or back leg was drawn first. As the foreground leg is partly recycled to give the shape of the background leg they were likely drawn foreground to background. An additional appendage is present towards the back of the belly (possibly a penis). This doesn't resemble a penis anatomically but would be excess if it were a leg.

1D: the line of the back and line of the tail were drawn before the line of the back leg. The line of the leg looks to have been worked from top to bottom. The line of the back and tail do not connect but it is probable that the back was drawn first the tail drawn in to fit the shape and scale set out by the back and then the line of the back came later and cut them both. The tail isn't quite complete and perhaps partially relies on the edge of the piece to add some detail.

1E: a line coming in from the top edge cuts the line of the back at a shallow angle, suggesting the back is older. The line that possibly connects to the front leg may be older

than the line of the back. The back was likely worked from left to right. The line runs up and begins from the top edge, and the raw material may have been used to give the mane and/or neck/head. It is probable that the head was drawn before the neck.

Plaque no. 682

In conservation and could not be studied.

Plaque no. 683

1A: the head is lost, likely due to breakage. The line of the chest is very fine and seems to run down into the line of the front leg. The legs are much more deeply engraved than the chest. The area directly before the deeper grooves of the legs have internal micro-striations which may be deliberate to generate a sense of fluffiness. The legs look to have been worked from top to bottom. The front leg is the background leg and the back leg is the foreground. The background leg was likely drawn first. The line of the foreground leg looks to cut the line of the chest/belly, suggesting it is older. The hooves are cloven. The front of the leg looks to have been drawn first running straight into the front of the hoof. The cleft was likely drawn as part of the front portion of the hoof. The rest was likely drawn with the back of the leg, top to bottom. Legs are narrow even up into the body.

1B: the line of the belly looks to disrupt the back of the foreground leg, suggesting it is younger. The lines of the belly look to be cut by the line of the back leg suggesting the belly is older than the legs. The line of the belly is cut at about the mid-point by 2 lines that are clearly packed and converge to a point. It looks like the belly may cut these lines suggesting they may be old (though it would make more sense the other way).

1C: the back legs look to have been made top to bottom. Lines of the legs look to disrupt short lines of the belly. Two lines give the outlines of one leg and a deeper and wider groove comes through to give the other leg. It is probable that this latter line came after the first leg.

1E: a series of angular deep grooves have been worked left to right. They don't seem to form a major component of the depiction but are instead internal features. A line with open termination cuts the back at about the mid-point. Line of the back is faint as it runs

over the far edge of the piece, skirting around the deeper lines. The back was likely drawn from left to right.

Plaquette no. 684

1A: (the cervid in right profile) the head looks to have been drawn from top of the head left to right. The nostril and mouth were likely added after the lines of the head. The snout and underside of the head were likely drawn after the top of the head. A curving line cutting through the head near the antlers cuts through and ambiguates the relationships between the head and the neck/chest. This line is later than the line of (1), suggesting the animal to which it belongs is also younger. The scale of the head is much bigger than the body – may have been misjudged, having to compensate by making the body smaller to compensate.

1B: the starting point for the line of the head is used for the starting point for the front of the antlers. The lines are proximate but don't seem to cut one another. More likely the head was first to properly scale the antlers? The front of the antlers looks to be disrupted by the line of the head of another animal (2), the head of an animal possibly stacked behind (1). The termination of the front tines of the antlers are recycled as the ears of the horse (3) in the same orientation. This suggests (3) was later than (1). The back of the front of the tine, again drawn from base to tine, has been used for the beginning of the back beam of the antler. This suggests the front of the antlers was likely drawn first. The other side of the back of the antler looks to be similarly worked from the base. Multiple lines were used to give each side of the antler. The tines were likely worked from the front, working all of the points and the back line came up last to finish the back of the last tine. The ear looks to have utilised the back line of the antler, using it to suggest the front of the ear and an additional line gives the back of the ear.

1C: the line of the back looks to have been worked from right to left, curving at the midpoint to give the shape of the shoulder and rump. The line of the back and tail may cut the line of (4) a cervid running at 90 degrees to (1). The body plan is heavily out of proportion and either the head is too large or the body too small.

1D: the chest and leg of (1) run down in a gradual curve before curving more steeply to give the long straight lines of the leg. A horse in opposite orientation (5) has used the line of the antlers, cut through the head of (1) and likely uses the front leg of (1) as the back leg of (5).

This suggests (5) is later than (1). The lines of the legs of (1) (5), suggesting (6) is younger. The lower body of (1) is somewhat ambiguous as there is a mess of lines running through this region giving multiple animals.

1E: the line of the rump and leg of (1) seems to cut inside the line of the back of (4). The line of the back of (4) cuts off the tail of (1). The line looks to curve back and again join the line of the back of (1). The line looks to curve back and again join the line of the back of (4). An arrangement of lines cut by the hoof of (6) may give the belly and the leg. Though this would only make sense if the back of (4) was used as the rump and back of the legs of (1). The hooves of (6) heavily disrupt this region and no further detail of the legs/belly can be discerned.

4: looks to be a reindeer (or certainly a cervid) in a unique orientation relative to the other designs.

4A: the snout of (4) has likely been cut through by the line of the back of (5). Antlers have been depicted at the top of the head. Possible confirmation of the line order of (4) and (5) as the antlers may have been similarly disrupted. The line of the head seems to have run from the top of the head towards the snout. The antlers were worked from the base where they meet the head. Similar to (1) they were likely worked in two sections. A possible additional line behind the back line of the antlers may be the suggestion of an ear. Some markings to the inside of the face may be an eye but these could be natural and fortuitous. Difficult to be sure but more likely it is an eye. The head was almost certainly worked from top of the head, down and around the snout and on to give the underside of the snout and jaw. The connecting line of the neck cuts the line of the jaw, suggesting the head was drawn first. The line of the ear looks to be older than the antler. The line of the top of the back looks to have been worked from right to left and likely after the antler and ear.

4B: the line of the belly looks to run all the way to the edge of the piece but has been heavily disrupted by later designs. The line of the back (1) definitely cuts the line of the belly of (4). Possible line of an outstretched and forward pointing leg but this could relate to another depiction not on the Sieveking diagram. The line of the belly looks to be disrupted by the hoof of (6). A front leg is almost certainly depicted. The leg curves and is cut by the hoof of (6), the back of the leg falls between the hooves of (6).

4C: the line of the back was likely worked from right to left and cuts off the tail of (1). (1) was drawn after (4) and the deep engraving of the may be an attempt to somewhat alleviate the effect. The line of the back slightly changes direction after the tail perhaps to give a sense of the neck/shoulder. The back runs on to the edge of the piece.

5: horse in left profile, head clear but the rest more difficult to spot, especially legs.

5A: the head looks to have been drawn from top of the head down and around the face. The facial lines to the top of the head are somewhat confused and this may be linked to another depiction cutting across this area. A prominent eye is depicted and this may have been drawn after the head. The line of the neck has been drawn after the head (certainly to the underside). It is likely that the radiating line dashed lines to the edge of the piece belong to this depiction but not all of the lines contact the neck/back. They likely represent the mane of (5). The line of the neck into the back appears non-continuous, confirmed by the model.

5B: there are two lines skirting the edge of the piece. The upper of the two is more likely to belong to the horse in right profile (3). The lower of the two lines is therefore likely the back of (5) and this is a better match for the position of the dashed vertical lines that give the mane. This line cuts the line of the last short vertical dash, suggesting the mane was drawn before the back. The back contacts the antlers of (1) and looks to cut them, suggesting (5) was drawn after (1). The line of the rump looks to cut across the neck of (1), suggesting it is older.

5C: the neck sweeps gradually around into the chest where it changes orientation into a straight leg. The neck/chest cuts through the line of the tail of (1), suggesting (5) is younger.

5D: the chin/jaw of (3) may be recycled to give a pointed, outstretched tail of (5). This would give a leg that is straighter and perhaps more in proportion. The line of the neck/chest/leg may also have been used. Lines of the jaw/chin of (3) have been worked from top to bottom but this isn't conclusive. No clear line that connects the front leg with the back leg. Made more difficult by the high volume of lines in the area. The piece may be unfinished. The lines across the neck of (1) could be the tail of (5)?

2: if (2) is a depiction there doesn't seem to be a broader body plan present. It seems to be reliant on the recycling of the eye of (3) to make it appear more face like and this may suggest it is fortuitous rather than genuine.

3A: the lines of the mane have been drawn in a slightly diagonal orientation, giving a mane that is forward pointing. The lines were drawn from bottom to top, from the plaquettes 'centre' towards the edge. The eye has been worked with two curving lines, one to give the top, the other to give the bottom. They have been worked from the back of the eye (top) to the front of the eye (bottom). The line of the face cuts through the line of the face of (1). The snout recycles the deep line of the neck of (1). Numerous lines have been used to give a tapering line of the underneath of the chin/jaw that curves back and around to give the shape of the jaw. The line of the front of the forward projecting portion of the antler of (1) has been recycled to give the ears of (3). The line of the front of the front ear continues past the shape of the ear and into the line of the face. The face was likely worked from top to bottom and the upper portion worked before the lower portion.

3B: a diagonal line cutting across the body of (1) could well be the neck/chest of (3). The stratigraphy of the lines support this view. This looks to connect to a possible pair of long, relatively static legs, cut by the legs of (6). This line may have been worked in both directions – some lines going up from chest to neck (?). The line of the legs looks to have been drawn from top to bottom. No obvious line of the belly can be identified.

3C: the line of the back was likely worked after the lines of the mane. Some of the mane looks to be cut by the line of the back. The line of the back skirts the edge of the piece which gives an effective back. The line of the back can be traced to the other curving edge to give the rump. There is some suggestion that the line of the mane of (5) and the tail of (3) from part of the line of the face of (5).

3D: the tail looks to have been drawn before the back of the leg. They don't directly connect but an additional line cuts across and joins them. This may still allow for the leg to be first and this additional line used as a fix to make the elements match up. The line of the neck of (5) cuts the line of the leg of (3). The lines of the leg look to have been worked from top to bottom. The front of the leg is less obvious but also looks to have been worked from top to bottom with no discernable line for the belly. The lines of the leg run down towards

the edge of the piece. No hoof can be discerned but the edge does look to have suffered from modern damage. Connecting the various lower body portions is difficult without a conclusive belly line.

6: large cervid depicted alone and likely last based on the legs that wrap over to the obverse. The antlers look reindeer-like, curving back behind the head and quite palmate. No furry neck as seen in some other example however. This looks to be more competent than some of the other pieces.

6A: while the head and antlers are back, suggesting the animal may be calling/bellowing, the mouth is closed, making the behavioural attributes less definitive. The line of the back of the head looks to have been drawn first working down towards the front of the muzzle. No space appears to have been left for either the ear or the antlers. Instead, the line of the head continues in a downward motion from the bur of the antler. The ear cuts the line of the back of the head but was likely drawn before the line of the back which seems to run up the line of the ear and then out into the line of the neck. The eye is depicted with deep lines to create a fairly circular form, likely composed of multiple lines. The underneath of the face looks to have largely been drawn right to left. The face looks to have been drawn from left to right towards the edge of the piece and the muzzle. The front of the ear looks to have been drawn before the back of the ear. The front of the antler has a line projecting forward for the beam which is cut by a line breaking off at an angle to give the line. The upper portion seems to be worked from main beam towards the edge. The connections between these lines is ambiguous as the lines as the lines curve across the edge. The line for the next portion of the beam then cuts this upper tine line, suggesting the antler was worked from bottom to top and from beam to tine point. This is supported by the arrangement of lines encountered at each tine. The back of the antler has also been worked from bottom to top and meets the back of the tine of the upper palmate section. This may suggest the palmate section was worked from front to back with the back line of the antler finishing it off, seen in some of the other antlers. Several lines running perpendicular to the line of the back of the antler, may be a later addition of an extra tine but could equally be later damage/scuffing.

6B: the line of the back follows the line of the ear and was drawn front right to left with several main lines 2-3 by location along the back. The back/rump cut across the scar of a small removal, likely natural, suggesting the engraving is younger.

6C: the rum is worked from top to bottom continuing on from the line of the back. The back of the leg has some lines emanating from the fine line of the leg to give fur, likely worked after the main line of the leg. The front of the back leg is somewhat disrupted by a large modern chip caused during excavation (probably). Three additional marks nearby looks to be similar damage. The line of the leg looks o be cut by a line that runs left to right down into the sheath/penis, an additional finer line above this may represent a first attempt at drawing this feature. The line of the leg ay have been worked from bottom to top (deep to shallow) though this isn't completely clear due to the disruption by the recent damage.

6D: line of the chest drawn from right to left, top to bottom. The lies of the legs look to cut the line of the chest. Some horizontal lines of the chest could suggest some interplay between chest and legs, with some details added later. The back of the leg was likely drawn top to bottom and the line of the belly looks to cut the line of the leg. the back leg is the foreground leg and the front leg is the background leg was likely drawn after the foreground leg.

6E: The line of the belly was worked from right to left with several deep lines. This line is disrupted by excavation damage but likely terminates in the line of the front of the sheath/penis. Probable order – front leg, belly, back legs, back of belly (back of sheath).

6 legs: the legs roll over to the obverse, are highly detailed and likely cut everything, suggesting this depiction is last.

Plaque no. 685

1: (just the mane) the edge has some cracking from heat fracture likely after decoration. The deep line of the mane may be all that is left of the depiction. The mane closely follows the edge of the raw material and uses this to give the neck/back of the horse. The head, assuming there was one, has been lost to an ancient break. The break is weathered and the

cause isn't clear. The lines of the mane look to have been worked from top to bottom (towards the edge). line of the back may be present – see (2B).

2: (larger horse directly below (1)).

2A: some anomalous lines of the cut by the face of (2) may be associated with the face of (1), possibly 'beard' hairs below the chin? If this is the case, it would support the position that (2) is younger than (1). The ear looks to be disrupted by the break that removed the face of (1), and seems to follow the line. Counter expectation, the horse below (2), (3), looks to be older [is it? – note later observations], suggesting a likely order of (1), (3), (2) [more likely (1), (2), (3)]. The ear was likely worked from bottom to top and no gap was left for it, suggesting it was drawn after the face. Confirmed, the front line of the ear cuts the line of the face/head. Several deep lines have been used to produce an angular eye and may disrupt a long linear. The line of the face was drawn from the top of the head down towards the muzzle. The face of (2) looks to cut the face of (5) (middle horse, opposite orientation) and about abuts the bottom of the face of (4). (outer horse, opposite orientation) but the lines don't seem to interact. This suggests (5) is older than (2). The line of the face continues around to the nose and mouth, with nostril and mouth added after the main outline. The line continues but becomes less clear around the chin. Some finer lines around this area likely reflect the bears below the chin. The line of the neck/ chest of (2) cuts the lines of the face of (3), again suggesting (3) is older than (2).

2B: judging by the position of the likely mane of (2), intermediate between that of (1) and (3). Correspondingly, the outer most line perhaps belongs to (1). The long lines which may represent legs for (4), (5), (6) are cut by the line of the back for (1), suggesting (1) is younger. (2) likely recycles much of the line of the back of (3) and branches the line after the withers to give a sense of stacking. The upper of the two deep, closely packed lines is likely the line of the back of (2). Line of the mane is forward projecting and was likely drawn from bottom to top and after the line of the back.

2C: the line of the neck/ chest of (2) cuts the face of (3) and looks to be drawn from top to bottom. The specific point of contact with the head is difficult to see. The front of the front foreground leg of (3) has been used as the back of the front foreground leg of (2). The front of the foreground leg continues on from the line of the chest, both lines worked from top

to bottom. An additional three deep lines in front of the foreground leg likely represent the background leg and were drawn after the chest/foreground leg, the lines of the background leg cutting the line of the chest. The lines of the legs of (2) seem to cut everything it encounters, suggesting everything in opposite orientation is older. The line of the belly (3) is likely recycled by (2) to finish the design.

3A: the line of the front of the face cuts the line of the ear, suggesting the ear was drawn first. The long linear which is cut by the eye of (2) is also cut by the face of (3). A small delicate eye has been added made with several lines to give a roughly circular shape. Part of the lines of the eye looks to have been incorporated into neck/chest of (3), the latter likely later. The line of the back behind the ear is somewhat ambiguous. The back of the ear looks to have been worked from bottom to top. The line of the back has likely been worked right to left and this was worked after another line also right to left was added. This later line gives an overly narrow neck and may have been connected by the now line of the back (assuming this line belongs to (3) and not the other design). The line of the face seems to cut through some horizontal fine lines. These were assumed to be part of the face of (2) but this would be inconsistent with the broader line order (2) and (3). These lines are associated with (2) in Sieveking's diagram. Could (2) be older than (3)? The lines of the bottom of the face can't be seen in the same degree of clarity as was expressed in Sieveking's diagram and there has been disruption from other lines. The long linear running through the piece may have been incorporated into the design somewhat to give the lower portion of the muzzle. A series of fine lines skirting this feature may give the face. Direction of working looks to be from back of the head to muzzle for the upper and lower portions of the face. The line of the jaw looks to cut through some finer lines that may have given the beard or may be part of another earlier depiction.

3B: The line of the neck was drawn from right to left and after the line of the head. 2 main lines used to give the neck that run closer together in parallel. The line of the neck/chest is cut by the 2 long linear lines that run through the centre of the piece. It is also cut by a horizontal line that runs to the edge of the piece but isn't obviously connected to any major designs. The features of (2) look to have been recycled to give the belly and leg of (3). It may run on into a slightly forward projecting line that may be a forward background leg. a line has likely been added to the back of the foreground leg of (2) to give the foreground leg of (3).

3C: the line of the back looks to be recycled from the line of the back from (2). This line looks to cut the long parallels running through the piece look to be cut by the line of the back - inconsistent with the face being cut by these lines. Instead the face must be incorporating these lines. The lines of the back is cut by two curving lines that aren't obviously associated with any designs. They look similar in engraving to a series of dashes close to them in depth and execution. Again, these dashes don't seem linked to any major design. the line of the back would look to be younger than the long linear lines of the legs of horses in opposite orientation. The lines of the mane look to cut the line of the back, suggesting they may be later. The lines of the back near the edge likely reflect the divergence of the line of the back of (2) and (3).

4A: the lines of the mane of a different animal have cut through the front of the face of (4), suggesting (4) is older. The face looks to have been drawn from top of the head to the muzzle, now last to the break and the muzzle to the jaw to the underside. Some lines suggest working from the jaw towards the muzzle. There is the suggestion of an eye somewhat disrupted by the line of a mane. The front of the face has been drawn by two main lines drawn from top to bottom. A line may extend on from the line of the jaw to give the neck. It doesn't seem to connect to the jaw. This may link the design to a fine line running down into the main orientation of a series of legs (between the middle of the two long parallels). If this is the case, the line was worked from top to bottom. The dashed lines fringing the piece may be associated with this design (though note some seem to cut through it). Another alternative is the muzzle of (2) gives the line of the neck but this doesn't work with the rest of the jaw. No obvious intersecting lines with other designs. As it is near the edge it is likely to be older based on the arrangement in opposite orientation.

5A: the line of the front of the face of the (5) cuts through the face of (4). The eye of (5) may be a triangular shape incorporating the 'neck' line of (4). This would give a fairly triangular shape. However, there is a curving line in front of this which could be part of an eye and may be naturalistic. The broken fragment to the edge has some details on it these likely belong to (5), top of the head and the ear. The underside of the jaw looks to have been worked from back to front towards the muzzle. This was likely also the case for the top of the head but the lines have ben disrupted by the break. The front of the face looks to cut across the face of (2). In this orientation it looks like the line of the face of (5) cut through the lines of the face of (2). However, the lines are inked.

5B: the line of the jaw into neck is obscured by a patch of concreted sediment. However, it likely connects with one of the long parallels (further to the right of the two in this orientation) that would give the chest and the leg. it is probable that (5) was drawn before (6). The lines don't seem to cut each other so this relationship isn't completely clear.

5C: the line of the chest looks to be cut by each line it encounters along its length. The line of the chest of (2) cuts through the line of the chest of (5), suggesting (5) is older. Look again at the face where (2) must cut across (5). The chest continues on into the leg which is cut by the line of the back of (2) and (3). These lines were likely worked from top to bottom. An extra line from the leg, a slight curve and projection is present before it cuts across the terminus of the chest and continues down to the edge of the piece.

5D: the line of the belly looks to have been drawn left to right and before the line of the back of the foreground leg which cuts the line of the belly and was worked top to bottom. The front of the background leg looks to have been drawn before the back of the foreground leg, the latter cutting the former. The line of the back of the background leg looks to cut the line of the belly and over run, potentially joining to another horizontal further up. These background leg lines are similarly cut by the lines of the back of (2) and (3). The leg may be used by (6) and the line it joins to the body of (6)?

5E: it is probable that at least some of the dashes skirting the edge form the mane of (5). They look to have been worked from bottom to top but order/direction isn't clear as they don't directly interact with each other. There are several lines that likely collectively give the back of (5) but which don't entirely meet. There are several lines that likely collectively give the back of (5) but which don't entirely meet. The 'first' line (closest to the head) is cut by the lines of the mane were drawn after the line of the back. This is so along its entire length with what look to be potentially different groups of dashed lines. There is a feature near the back which looks like it could be an eye or an ear - extra design in here somewhere? The lines of the back look to have been cut by the lines of the legs of (2)/(3), suggesting (5) is older. However, somewhat suspicious as the lines here are well inked.

6A: the head has likely been drawn from the top of the head, down around the mouth, curving round to give the mouth, and curving backround to give the underside of the chin.

The front of the face has been re-drawn in the same orientation, the lines of the two meet under the chin. The inner profile of the face was likely drawn first. The line of the jaw looks to have been drawn from top to bottom and a series of dashes drawn between the chin and the jaw to give the beard. These were drawn away from the body.

6B: the lines of the mane look to cut the lines of the back of (5), perhaps suggesting (6) is older. The lines of the back of (5) may also be recycled by (6) to give the line of the back. No overlapping lines with the mane so this is a best guess for the relationship. Several lines running from the jaw to the edge of the piece may be the neck but the broader line would make little anatomical sense. These lines have been worked from left to right and are cut by the lines of the legs of (2) and (3), suggesting (6) is older.

6C: there could be a line running down from the jaw to give the neck and chest, the line branching to give the chest/ belly and the leg. this would see the recycling of the back of the background leg of (5) but would explain why this line cuts the belly of (5) perhaps? These lines fit anatomically and proportionally and would make (6) more stylistically similar to (5). Much of this line is uninked and its presence is more obvious in the 3D model. The line is difficult to trace from neck to chest. It looks like the line was worked from top to bottom (neck to chest/belly). the line of the belly is cut by a small joining line of the leg. leg, belly, then joining line for order?

685 reverse: the reverse surface looks to evidence heating in the form of cracking and a 'crazy paving' pattern. There are also anthropogenic markings (or what look to be anthropogenic markings). There is some 'decoration' on a broken chip which is consistent with the obverse and the disruption of (5) and suggesting the markings may be old. Direction of working in the pictured orientation seems to be primarily top to bottom in the pictured orientation and right to left for the horizontals. A leg and back of a belly may be depicted but this could easily be fortuitous. There are no diagnostic features to the 'leg' making this claim more difficult to demonstrate. Some of the cracks look to possibly break these lines. If this is the case they are more likely anthropogenic and burning is likely to have happened after 'decoration'. Two curving lines look to have been drawn from bottom to top and look to closely follow the shape of each other but don't seem to connect with anything. Lines below this are broad and look to cut the 'crazy paving', perhaps suggesting these lines are natural and later. Many of the lines on this surface are short, wide and close

to the edge. This could point to a different type of working or may make the lines somewhat suspect as anthropogenic signatures.

Plaquette no. 686

1A: decoration disrupted in two places by removals, the back of the legs and the rump. This suggests the figure is older than the breaks. The line of the back is ambiguous towards the contact with the head. Much of the detail of the head and neck/back have been lost to erosion. The line of the back looks to have been worked from right to left. The line may continue directly into a raised tail but this would be slightly odd – more likely the rump/tail is lost to the break? Sieveking diagram does seem consistent with the lines. The line of the back looks to cut some lines that don't seem to fit into the design but which are anthropogenic. The deeper line to the mid-point of the back looks to cut the back. Given the presence of some anomalous details to the far left edge, could there be an additional design present in opposite orientation? There may be some fine vertical dashes to give the line of the mane but difficult to be sure as the area is so eroded.

1B: the line of the neck/chest looks to have been drawn from top to bottom. There is no obvious connecting point with the head as this area is again heavily eroded. The line of the chest looks to be cut by the line of the leg. the front line of the leg looks to have been drawn from top to bottom. The back of the leg is more ephemeral but looks to have been drawn from top to bottom. There may be some additional details suggesting a cloven hoof connecting these lines but this would be inconsistent with this design as a horse (though note the odd tail).

1C: the back of the line of the belly may depict a sheath/penis suggesting the animal is male. The line of the left side of the sheath was drawn from left to right and sits above the line of the back of the leg making line order ambiguous. Line of the sheath cut by the line of the leg (change of light angle). The right portion of the sheath looks to have been worked from right to left. The broader line of the belly is difficult to see and was likely drawn from right to left. Some vertical lines behind the line of the front leg may be the back leg. Interaction with the belly isn't clear. There may be some modern disruption also from excavation damage.

1D: the front of the back leg looks to have been drawn from top to bottom after the line of the shaft/belly. The line of the rump/back of the leg looks to have been drawn from top to bottom and was likely drawn after the back/tail. The lines of the leg don't seem to form any sort of hoof – they just leave an open stump.

1E: confirmation of the small lines of the mane between line of the back and the head (or where the head should be). A possible eye is depicted close to the very faint remnants of the front of the face. The line of the face curves underneath to give the line of the muzzle but no additional details can be discerned. Not possible to tell line order with the neck with the neck/mane/chest as they do not directly connect, likely due to erosion.

- the markings to the bottom left don't seem to be figurative but are anthropogenic.

Reverse: two main animals to the 'reverse' a horse and an ox(?), both in left profile and on stacked over the other. Relatively clear compared to the 'obverse' surface. Some concretions across the surface.

2A: the line of the face is relatively clear and there are vertical dashes indicating the mane. The lines look to have been worked from bottom to top. The shape of the head/neck/back follows closely the edge shape of the raw material and this has certainly influenced the design. Line of the head not connected to the lines of the mane but can presume continuity. The top of the face looks to have been drawn from right to left. The meeting point with the line of the muzzle is angular and an additional line may have been added afterwards to soften the lines into more of a curve. The line of the jaw is close to the line of the neck. It was drawn from right to left and likely met the bottom of the line of the muzzle. Two longer curving lines look to be disrupted by the line of the face and are likely not part of the design. an eye looks to be present but it difficult to be sure of how it was worked due to the density of concretions in this region. A nostril has been depicted but this could be a natural feature incorporated into the design. More likely it was produced by a rotational action of the tool. The lines of the mane look to have been worked from bottom to top.

2B: the line of the back was drawn from left to right with several lines, likely after the mane and head were depicted. The back skirts the edge of the piece and as it runs around the edge it encounters the line of the back/rump of (3). The line of the rump of (3) may cut the

line of the back of back/rump of (2) but it is difficult to see the relationship here as it is so close to the edge. The 3D model looks to support this interpretation.

2C: the line of the neck of (2) looks to have been drawn from top to bottom and cuts through the line of the back of (3). Note the inconsistency with observations above. This is likely the correct observation as the previous was much more difficult to see. The line of the chest is cut by the line of the leg. This line runs across the body of (3) and merges with the line of the leg of (3), both cutting the belly of (3).

2D: the back of the leg has been drawn from top to bottom but is short and doesn't seem to connect with anything. There is realistic hoof arrangement which is part of (3) which may be being recycled but this would make the leg appear at an odd angle. The lines project on from this and may be the actual leg of (3)? Need to analyse (3) to confirm/deny. The line of the belly is ephemeral and it is difficult to be sure exactly where the line connects. It interacts with a long linear that runs above the contact with the belly and runs down to the edge of the piece (too long for an accurate leg). This may be the line of the leg. However, the line of the leg of (3) may also be the line of the leg of (2). Two lines connect to the leg of (3) with the lower of the two being the belly of (3). The leg considerably overshoots this and could be to connect with (3)?

2E: the line of the back continues on to give the line of the tail which hugs the edge of the piece. The line of the underside of the tail and the back leg is ambiguous and made more complex to interpret by the super-imposition of (3). The lines of the tail do not meet making interpretation more challenging but it is probable the line of the back/tail upper portion came first. The back leg of (2) may recycle the back leg of (3) but there are additional lines present which may point to the depiction of a finer separate leg. The line of the tail may continue in a rough linear made up of several dashes running from top to bottom. The style of engraving looks a little different here so this line could be separate. This tail does look compatible. The end of this arrangement looks to possibly cut the line of the leg of (3).

2F: the most probable line of the back of the back leg is a line running through the middle of the line of the leg of (3). This runs in a similar orientation relative to the tail. This is a different type of line, broader, but is likely anthropogenic. It has been cut by the front line of

the back leg of (3) and if it is natural, it is old and may have been incorporated into the design. The series of dashed lines at the top of the leg, while possibly associated with the leg of (3) may also be associated with the leg of (2). There does not appear to be a front portion to the back of the leg, or obvious hoof arrangement, again making interpretation tricky. The lines depicting fur would be in the correct orientation for the broader body plan. These lines look to have been drawn from top to bottom.

3: aurochs/ox? Not bison – no hump, not as hairy and horns are different. Presence of a possible penis on the 3D model suggests a male.

3A: the head of (3) may have been drawn twice. The current deeply engraved and quite clear design looks to cut across finer engraving, with the front of the face and an upward pointing horn being visible. It does look as though the more prominent head cuts the line of the finer head, suggesting the deeper engraving is later. These lines do run on some way around the piece – this arrangement could just be fortuitous with the presence of the later head of (3)? Could this line represent an early abandoned attempt in opposite orientation? A clear eye is depicted and is roughly elliptical in shape, made up of several lines. The lines of the back look to be cut by the line of the ear suggesting a likely order of horn, back, ear. The horn is made up of several lines, working from head to horn tip. An initial line to both gives the base of the horn and the curvature, the other lines continue the shape and give the point of the horn. The underside of the horn may have been drawn second. Eye has likely been drawn from back to front. The line of the face has been drawn from top to bottom with several lines. The line runs to the tip of the nose and then an additional line continues around and under the chin. A nostril and mouth have been added to this after these lines. The underside of the chin runs up towards the mouth and joins from an overshoot line to give the underside of the chin/jaw.

3B: the line of the back looks to have been drawn from left to right and is cut by a long linear line running vertically that is a component of (2). This line continues into the tail where a series of short lines give an angular curvature to suggest the tail (upper portion). Some lines inside the main outline look like an attempt to narrow and soften this angular arrangement and perhaps make it more realistic. The underside of the tail looks to cut the back of the back leg, perhaps suggesting it was drawn last of all.

3C: the line of the neck looks to be cut by the line of the jaw. This is atypical but so is the arrangement of the face so potentially viable. The neck/chest was worked from left to right and is cut by the line of the front of the leg, suggesting it is earlier. The back of the front leg has likely been cut by the line of the belly. The leg has been drawn from top to bottom, likely the front side first followed by the back. The back line has also been drawn from top to bottom, with every major change in direction being done with a new line. The back of the hoof may have been drawn from bottom to top. Some lines extend beyond this hoof and Sieveking doesn't display the hoof but instead uses the extended lines. These extended lines would make the leg too long, though would match up well with the back leg, and the hoof is very clear on the 3D model.

3D: several lines cut the back of the front leg and represent the belly, giving two main belly profiles. The upper most line seems to continue past the line of the back leg. The line cuts the line of the back leg suggesting the line may have been extended at a later time. The front of the back leg cuts the line of the belly. There is no clear reason to do this as it doesn't seem to contribute to the design.

3E: the line of the front of the back leg is drawn from top to bottom in a long sweeping line. Modern excavation damage partly disrupts the bottom portion. There is a clear attempt to depict a hoof and this has been expanded with additional detail around the main line of the leg? The back of the leg also looks to have been drawn from top to bottom. The line of the tail of (2) looks to cut the line of the leg of (3). Again, each major change in direction is marked by a new line working from top to bottom. The line of the underside of the tail cuts the line of the back leg and was likely drawn last. The fine lines around the upper portion of the leg look to cut the line of the front of the leg, suggesting they are younger.

Plaque no. 687

Note, one side of this piece has not been scanned by 3D, it was missed in the original work as the same surface was scanned twice. The unscanned surface is very densely occupied.

No. 687 obverse: heavy concentration of lines minimally depicting a horse (2) and a reindeer (1) at 90 degrees to each other and potentially more.

1A: the line of the head (1) is cut by the back of (2), suggesting (2) is later. The head was drawn from left to right and likely top to bottom with deep lines. Some of the lines around the open mouth are relatively fine by contact, likely reflecting the more delicate action required working in a smaller space. The animal is a cervid based on its antlers. Look somewhat palmate in the upper reaches perhaps suggesting reindeer? A gap has been left for the antlers as they seem to have been drawn after the head, cutting the line.

1B: the line of the back looks to have been worked from right to left with deep engraving. The line is partially coated in ink making order with the lines more challenging. It is probable that the line of the legs of (2) cut the back of (1), again suggesting (2) is later. The line of the back runs towards the edge of the piece but with no obvious signs of a rump or further detail.

1C: the line of the neck/chest have been worked from top to bottom towards the legs. The meeting of the neck and chest in (1) has been recycled for the chest of (2) and the legs of (2) cut the chest of (1). The legs of (1) are relatively clear while the chest is much more difficult to see. It is probable that the legs were drawn after the line of the belly. Foreground and background legs are depicted, though the specific relationship is hard to discern due to the lack of clear belly line. The back of the background leg is also the front of the foreground leg, though they split further down their length. The line of the belly is ambiguous. No obvious sign of any additional details.

1D: the back of the antler looks to have been worked from the base to the top with not tines protruding from the beam. The cervid head is back and mouth open, perhaps calling. It is probable that as with other antlers the front was worked from base to top, as was each line as encountered. The closing at the top of the antlers is ambiguous and may disrupt the features of an additional animal below (3). Series of fine linear lines between the line of the antler and back, and across the antler, cut by both.

2: schematic horse depicted 90 degrees relative to (1) and fitted to the size and shape of the piece, cuts (1) in several places and recycles features.

2A: the line of the back looks to have been drawn from left to right, the ears run slightly over the edge of the piece and were likely drawn from bottom to top. The face has likely

been drawn from the top of the head to the muzzle around the mouth and underneath the jaw.

2B: there are two lines of the back. A finer line skirts the edge of the piece while a deeper line is on the obverse proper. The deeper line is worked from left to right with multiple lines. Both lines meet as the deeper line continues to give the line of the rump. It is probable that the finer line was first and the deeper line was a correction or adjustment to this. The fine line may have given the rump but this is now masked by the deeper line. The finer line of the back may actually cut the deeper line of the back under the microscope.

2C: the line of the rump branches into two, one line giving the back of the background leg, the other giving the back of the foreground leg. It is probable that the foreground leg was drawn first and the background leg was drawn after, following the shape and scale of the foreground. The front of the foreground leg looks to cut the lines of the belly, suggesting it was likely drawn after the belly. This gives a slightly exaggerated curve to the belly as it meets the leg. The line of the leg looks to cut the lines of the front legs of (1). The lines of the legs run over into a slight depression and don't seem to obviously end in hooves, making line order more difficult. The foreground leg may have had a hoof but the area looks damaged and detail may have been lost. Numerous lines have been used to make the belly and it was likely worked from left to right. The relationship is made somewhat ambiguous by the presence of ink between the belly and the front legs. The chest of (1) looks to be in part recycled by (2) to give part of the chest/belly and this line cuts across the legs. It is probable that the legs were added after the neck and the rest of the belly looks to come after, the line of the belly cutting the top of the line of the back of the foreground leg.

2D: the line of the neck is difficult to trace due to the density of engraving in this area. The line appears non-continuous and may be further confused by an additional head depiction below the head of (2). The line that joins the back of the jaw looks to have been worked from left to right, though some lines between this lines and the broader chest/belly look to have been drawn from right to left. It is likely that the head was drawn before the line of the neck.

2E: the foreground leg has likely been drawn first followed by the background leg which is fitted to the scale and shape of the former. The background leg doesn't look to contact the belly directly but has been drawn parallel to the line of the foreground leg. Much as with the back legs the hooves don't appear to have been particularly well depicted. The lines seem to change shape/position somewhat but the hooves proper are not depicted. The foreground leg does have a line that cut back up that may give the outline of a hoof but again this is quite limited and doesn't join with the open, flared line of the back of the leg.

- there is almost certainly more going on on this surface but without a 3D model to test against the 3D and record won't pursue this further.

Plaquette no. 687 reverse

The form to this side is ambiguous and looks to be incomplete. If all lines are part of the same piece it would look to be a cervid but if not it could be a horse. The face looks horse-like but the broader body plan looks cervid like.

3A: the eye is made up of two main curving lines, a short line to give the left side and the right line, longer and curving, to give the right side, with and additional marks in the middle giving further detail. The front of the face has been drawn from top to bottom towards the muzzle. A curving line from the base, meeting the line of the top of the head, curves sharply to run almost parallel with the line of the face and is likely a line of an antler. The upper portion of this line has been worked from right to left. The front line of the antler (main beam) looks to have been worked from bottom to top, or from the head towards the far end of the antlers. The underside of the jaw looks to have been worked from right to left. This joins with a line from the top of the head that would yield a very narrow face. Additional lines to the top of the face may be a correction. An extension of the bottom line may also be an attempt to correct this arrangement and produce a more accurate face. The back of the antler looks to have been worked from bottom to top, though some lines may have been worked the other way. The linear may be a tine before the antler sharply changes orientation to the left. The inside of some grooves towards the top edge are black, suggesting the engraving occurred before this event (burning)? The long curving arrangement looks to cut some of the tines, suggesting the antlers may have been re-drawn several times or in stages. Tines generally seem to be drawn from beam to point and from base towards the top of the antlers.

3B: (much of the detail of the broader body plan seems to be lost on the 3D model and is sparse on Sieveking). The broader body is a ghost compared to the head and antlers – sediment on the surface and erosion? Two closely packed lines running left to right form the back of the neck but don't connect to the head itself. The line of the back looks to be heavily eroded and is barely visible. Based on the arrangement of the initial lines of the neck, it is probable that the line of the back into the rump was drawn from left to right.

3C: as with the back, the lines of the back leg are indistinct and difficult to see. They look to have been worked from top to bottom. There doesn't appear to be any obvious line of the belly, making broader interpretations more challenging. No obvious hooves to the back legs but there may be suggestion of background and foreground in the legs.

3D: some non-continuous lines around the area of the neck behind the head but doesn't connect to the head or to the legs. The legs aren't particularly naturalistic and are closely packed together. The hooves are simplistic and do little more than produce closed stumps. The back of the front leg and front of the back leg are shared. It is probable that the back leg is foreground and the front leg is background.

Additional features: a possible leg arrangement below the head in what would be right profile. A line skirting the bottom edge which may be a back 180 degrees relative to (3). Some additional lines that run through the antlers of (3). None of these features seem to obviously belong to a broader design, though the surface does seem to have been subject to erosion. Heavy sediment crusts to the surface.

Plaque no. 688

Main ibex in dynamic motion. Additional ibex head turning over its shoulder disembodied, and some suggestion of horns and head above the main design, perhaps linked and trying to indicate movement.

1A: the front of the head was likely drawn first from top to bottom towards the nose, followed by the horn and ear, in turn followed by the line of the back of the head which cuts the line of the ear. The foreground horn has been drawn first from base to tip and likely from front to back. Both lines of the horn drawn from the base. The background horn has been drawn using the line of the back of the foreground horn for the base of the lines.,

drawn in the same manner as the foreground horn. Both ears are depicted, foreground and background. The foreground ear is drawn bottom to top in both lines. The back ear uses the foreground for its scale and position and was likely drawn after the foreground. The line of the background horn may extend and be used again in a related depiction above. The eye is circular and has been made with two main lines, one each to give the top and bottom portions. There are two lines below the eye which may be further details associated with markings. These lines have been drawn from the back of the head to the front. The line of the face may have been drawn from the muzzle to the back of the head. A nostril has been drawn after the main outline and drawn from the outer edge towards the inner area (from front of head to back). A curving line gives the underside of the mouth/chin and a line has made a mouth, from edge to inner area. The bottom of the face doesn't seem to connect to the line of the neck.

1B: the line of the neck and chest are made with several lines working from top to bottom to give the neck, a deep chest and moving into a short leg, with an attempt through these features to perhaps depict movement. These lines have been worked from top to bottom, from the head towards the edge of the piece.

1C: the line of the belly is made up of a mess of lines that seem to run both left to right and right to left, perhaps suggesting this area has drawn the attention of the artists on several occasions. There may be an attempt in the use of several lines to perhaps depict fluffiness and movement? The back of the front leg has been drawn from top to bottom and continues on to the edge of the piece. There is no sign of any hoof. The line of the belly is partly disrupted by the line of the repaired break running through the centre of the piece.

1D: the back legs of the animal are a little anomalous. They almost look to have been drawn twice (sharing features with the head perhaps). The line of the legs cuts the line of the belly suggesting the legs were drawn later. In one position the legs are outstretched, suggesting movement, while in another they appear perhaps incomplete but more stationary. This may not be a correction or stacking of depictions but instead an attempt to depict movement. The more static arrangement looks to have been drawn first and from top to bottom. The back of the leg and into the rump seem to be connected to the line of the back. The extended legs cut over the top of this arrangement, looks to have been

worked from left to right (top of the leg to bottom). Again, the legs don't seem to end in hooves but rather open stumps.

1E: the line of the back has been cut by what looks like an additional head of an ibex (2), drawn in such a way as to make it look like the animal is looking over its shoulder (reminiscent of No. 662). The line of the back is made up of several lines, all look to have been worked from left to right. The line of the back extends into the rump where the line runs into the short tail. A line recommences below, joining with the line of the back to give the back of the back leg. The front line of the leg also looks to cut the line of the back, supporting the view that the leg was drawn after the back.

2: the ibex head that cuts the back of (1) is a little more difficult to see, in part because of the repaired break running through the middle of it. It looks to be drawn in much the same style as (1). Part of the same composition? The lines of the back/neck has been drawn from bottom to top, cutting the line of the back (1). It is non-continuous with the rest of the head, a gap perhaps having been left for the horns. There are some lines running off here that suggest horns but they are incomplete and indistinct, possibly disrupted by a chip to the edge. The top of the head is disrupted by the break and it is not clear how the horns interact with the line of the top of the head. The muzzle has been drawn right to left, top to bottom, with a mouth marked. The chin contacts the back of (1) before curving up and around and then running around and down to give the line of the neck and chest, cutting the line of the back of (1). These lines look to have been worked from top to bottom. A series of fine dashed lines may be a suggestion of fur to the front of the line of the neck/chest. An eye can't be discerned but this might well have been lost to the glue of the repair.

3: the arrangement of lines above the head of (1) looks like schematic ibex heads with horns. There may be several stacked behind one another. The lines of these look to have been drawn from bottom to top, as was the case in (1) for the horns. Part of the arrangement of (3) makes use of the lines of the horns of (1) and it is perhaps reasonable to presume they are part of the same drawing event even if not the same animal.

Plaque no. 689

1A: the front of the head looks to have been drawn from right to left (top of the head to muzzle). The antler looks to have been drawn from bottom to top and looks to disrupt the line of the head. The line curves around the muzzle and an extra line gives the mouth. The line continues to give the chin. A line cuts this and gives the neck. Some short dashed marks have been added, likely later, to perhaps indicate fur to the neck and chest, could be reindeer? The antler doesn't have many tines, perhaps pointing to this being a young individual. A mark has been added to give the nostril. The eye looks to have been drawn with two main lines, a line to give the top and a line to give the bottom of the line. These lines seem to extend to give a line that runs parallel to the line of the face, and another that runs in a similar orientation to the neck and broader body. These could be linked to patterning on the fur.

1B: the line of the head may have been completed and the antlers added after – the antlers cut the line of the head and the line of the head looks to form a solid line. The upper beam of the antlers look to cut through many of the lines in the upper portion of the plaquette. The line which looks like it was made with the side of a tool (wide and internally striated), and very similar to the line skirting the bottom edge of the plaquette looks to cut and completely obliterate the end of the tines, suggesting these lines may be later. The depiction of working seems to be from bottom to top, and from base point for each tine, for the antler. a deep line cuts through the upper portion of the antler beam, suggesting this was also later. The upper beam almost looks to have been drawn twice. This may be a connection or perhaps even an attempt to give a rough sense of foreground and background.

1C: it is difficult to tell directionality in the line of the back but it was probably worked left to right and seems to curve at around the position of the shoulder to join another line that takes the line of the back to the edge of the piece. This latter line is longer and the line of the neck/back merges at roughly its mid point suggesting this line was likely already present and has been recycled. A number of lines within the body plan, worked from left to right, looks to depict fur and run down in a row to the bottom edge of the piece. The relationship between the internally striated line and this series of lines depicting fur isn't entirely clear. Nor is it clear if this line was disrupted by the break as it appears non-continuous but associated. Some lines do show the black colouration perhaps supporting that the depiction was drawn before the burning event. The other lines to the surface are

anthropogenic but don't obviously form any sort of design. Caution needed about the internally striated lines – could these be trampling. Alternately, could they be associated with (1) – water? Swimming 'reindeer'?

Plaquette no. 690

Three animals in three orientations, two reindeer (1) and (2) and a possible wolf (3) or dog. The piece is broken to four edges and it is possible this was the shape the designs were fitted to based on the body position of (1) especially.

1A: the line of the back of (2) looks to cut the antlers of (1), perhaps suggesting (1) was drawn before (2). An eye looks to have been drawn in the form of a simple indentation. A slightly elliptical arrangement above this could perhaps be the eye, made in two parts to give the top and the bottom portions. The line of the neck and chin looks to have been drawn from bottom to top curving around and running to the edge of the piece. The top of the face looks to have been drawn from left to right and runs on to the edge of the piece. The antlers were likely drawn after the line of the head. The antlers look to have been made from the base to the tip and each tine from the base to the tip.

1B: the line of the back of (1) looks to be cut by the line of the leg of (2), suggesting the latter is likely later. The direction of working for the back looks to be from right to left. There may be a tail depicted where the line of the rump is started slightly before the terminus of the line of the back, the projection being used as the tail. The line of the rump looks to have been worked from top to bottom and skirts the edge before joining the line of the back of the leg.

1C: the neck and chest look to have been elaborated by a number of lines running from top to bottom to give the suggestion of fur. The line of the face and chest may have been drawn twice, the line of the chest and leg giving a narrower shape but the fluffy lines giving a deeper chest and better proportioned head. The line of the leg and chest have been partly recycled by (2) before cutting through the neck and antlers of (1). The line of the chest continues into the line of the leg of the front leg. The lines of the front and back lines of the front leg were drawn from top to bottom. Lines look to give schematic, pointed hooves. Lines running down the middle of the leg may be an attempt to split the leg and

give a sense of foreground and background, though the effect isn't entirely obvious and may be a product of lines associated with other designs.

1D: the line of the belly looks to have been drawn right to left and has been disrupted by the line of the neck and chest of (2), again suggesting (2) is later than (1). The line of the belly seems to continue on further than the line of the back leg.

1E: the line of the background leg looks to cut the line of the belly suggesting the legs were drawn after the line of the belly. The background leg seems to end in an open stump and is more simple than the foreground leg which looks to have a hoof. The possible hoof (1) may actually be the eye of (2)! The line of the legs look to run on a little further (not obvious on the 3D models) and end in an open stump. Both legs look to have been drawn from top to bottom and the foreground was likely drawn before the background, the background shaped to the size and scale of the foreground.

Additional: two lines cut by the line of the chest may be a possible leg, worked from top (inner ear) to the bottom (edge of the piece). These lines look to be cut both by the chest of (1) and the back of (2). This former relationship would be anomalous so these are possible. Fine lines to the inner area emanating from the neck across the body are likely fur. Given the position of (2), they may be recycled for this purpose in (2) also.

2A: the eye of the piece is clear, round and large. The line of (3) looks to recycle the line of the eye, suggesting (2) came before (3) but also marking the arrangement of the lines more difficult to discern. The line of the head looks to have been drawn from top to bottom before it runs over the edge. The lines of the antlers look to have been drawn from the base towards the tip in all cases. Each tine has been worked in the same way. The antlers look to cut the line of the leg of (1), suggesting (1) is older than (2). The underside of the face has been drawn with numerous short lines running left to right. A series of short lines around the neck, worked from proximity to the figure away from the figure and may represent fur to the neck and chest. This may point to this animal being a reindeer. A longer, deeper series of lines could be a continuation of this fur but sit much deeper in the body, not quite right anatomically. Instead they are more likely to be associated with (3), possibly the legs.

2B: the fine line of the belly, connecting the neck and the front of the leg is heavily disrupted by the long, deep engraving, perhaps supporting its association with (3), and that (3) is older than (2).

2C: the lines of the legs of (2) look to have been drawn from top to bottom and run to the edge of the piece with no sign of hooves. The line of the back of (1) is recycled as the front of the front of the background leg. The foreground leg connects with the line of the belly and cuts the line of the back of (1). It closely resembles the morphology of the back of (1) to make this appear more leg like in this orientation. The back of the foreground leg again is drawn from top to bottom. Several fine lines run off to the left and rapidly hit the edge to give the suggestion of the belly.

2D: line of the back likely drawn from right to left. It recycles the line of the chest of (1) before cutting across the neck of (1) and through the antlers.

3A: looks to be the head of a possible wolf (Sieveking suggests a deer), framed by the front legs of (1) and cutting the eye of (2). The belly of (1) perhaps forms the back of (3). These features suggest (1) is older than (3). The eye looks to have been formed with two main lines giving the top and bottom portions and likely worked from front to back. Two lines look to give ears, slightly curving forwards and likely drawn from top to bottom. The front of the face was likely drawn from the eye of (2) towards the back of the head of (3). A curving line gives the muzzle, an additional line a long mouth, and a curving line to give the bottom of the mouth/chin, likely drawn in that order. This arrangement is cut through by a later line that doesn't look to be part of the design. The underside of the jaw is drawn with two lines and cuts through a localised depression in the raw material. The line continues and terminates in two short, fine curving lines that over-run the line of the chest/leg. These fine lines cut through the line of the belly of (1), confirming (3) is younger.

3B: a series of deep lines have been drawn from the top (towards the head) to the bottom (away from the head). They look to have been drawn after the head/neck and likely represent the legs. However, there is no suggestion of hooves or paws at the end of these lines, they end in open stumps. There is no suggestion of a belly or broader body plan suggesting the form is a fairly schematic one and perhaps even incomplete. These possible legs heavily disrupt the line of the belly/chest of (2), again suggesting (3) is younger. There

is no suggestion of a rump or back other than the portion of (1) that has been recycled for this purpose.

Plaque no. 691

Large, flat plaquettes with minimally three animal depictions, a reindeer and two horse, perhaps more with stacking. The piece is broken to the right edge where the muzzle of the reindeer has been lost. The position of the leg of the reindeer suggest that the pointed end was likely this shape before the depictions were drawn and they were fitted to this shape. Almost certainly a third horse stacked within the arrangement of the other two horses.

1A: the head looks to have been disrupted by breakage to the right edge of the plaquette, suggesting this break is relatively recent. The design is naturalistic and the body posture and arrow to the neck may suggest a dead animal or an animal which is dying, perhaps akin to the depiction in No. 661 of the bison. The line of the top of the face and into the muzzle has likely been drawn from the head towards the muzzle, disrupted by the break. The eye is made by an inner set of lines to give the top and the bottom sections. An additional line looks to have been drawn around the eye from the front of the op portion. A line below the eye drawn from right to left looks to be associated and may be extra detail. A series of fine lines radiate out from this line suggesting fur. Two lines cut across the line of the face and these may be older but this is difficult because ink is present in the lines of the reindeer (1). The underside of the jaw looks to have been drawn from left to right and again disrupted by the break to the right edge. The line of the neck (1) looks to have been potentially cut by the front of the face of (2). The line of the neck has been made with multiple lines and likely drawn from top to bottom, likely after the line of the jaw. A series of fine lines drawn from left to right in a diagonal orientation all drawn in parallel. There is no line of the chest but these lines collectively form the profile of the chest. A 'dart' cuts through this arrangement, suggesting it is a later addition to this region. This is drawn in roughly orientation and is again left to right. A circular line around the end of the dart was drawn after the main line of the dart and could be fletching. Around the head the relationship between (1) and (2) is ambiguous but the legs seem to confirm that (1) is older than (2). The antlers are short and somewhat palmate, when taken with the furry neck is likely reindeer. It is probable that the line of the face of (2) cuts through the antlers of (1) but this is made ambiguous by the presence of thick ink within grooves. The line of the ear/antlers

doesn't seem to directly connect with the line of the top of the head. The ear and tine were probably worked from left to right from base to tip in each case.

1B: a joining line between the chest and the front leg was likely drawn before the line of the leg. This relationship is obscured by the presence of ink within grooves at this location. The leg is curved under the body and has been drawn with several lines. The front side of the front leg looks to have been drawn from top to bottom. A new line is used to produce the curve at the knee. An additional line gives the straight section of the leg between the knee and the hoof and curves to the edge of the piece to give the hoof. The working of the back of the leg has similarly been done from top to bottom and with new lines to achieve the curve in the leg. A line runs on beyond the outline to give more detail of the back of the front leg. Four lines run down the length of the top portion of the front leg, worked from top to bottom and perhaps hinting at extra detail, perhaps fur.

1C: the line of the belly is interspersed between lines of the back of the front of the leg, worked right to left and likely after the front leg. Somewhat ambiguous due to the high quantity of ink in this region. The line of the belly has been cut by a number of vertical lines, the lines of the legs of the horses, suggesting that (1) is probably the oldest depiction on this piece. The line of the back leg was likely drawn of the line of the belly, an extra line hooking around over the top and joining the end of the line of the belly.

1D: as with the front leg, the back leg looks to have been drawn from top to bottom and new lines used to achieve the curving lines to allow the limb to tuck under the body. The front of the leg continues on to give a projecting, pointed hoof, made with the same line as the leg. The hoof is cut by an arrangement of lines that may suggest the hoof has been re-drawn. The line of the rump cuts the line of the back of the back leg suggesting the leg was drawn first. Portions of the leg have also been cut by the horse again suggesting (1) is the oldest. The join to the front of the hoof was likely drawn from right to left, from point of the hoof to the back of the leg. There may be the suggestion of a background leg to the back but this is not entirely clear.

1E: the rump has been drawn with multiple short, curving lines to give a sense of fluffiness. They look to have been drawn from top to bottom and likely after the line of the back and

certainly after the line of the back of the leg. This region was likely drawn last. Again, this area is cut by lines of the details of horses which overly suggesting (1) is the oldest.

1F: the line of the back of the antlers into the neck/back is not immediately clear and has perhaps been obscured by the horse (2) which overlays it. The line of the back may have been utilised in the drawing of the eye of (2). It seems to skirt a natural hole in the surface which was likely present before the depictions were drawn. The line of the back becomes more clear towards the back of the animal and looks to have been worked from right to left. The line of the back overshoots the arrangement of the rump with some angular lines that are quite straight for the curving back/rump. The line of the back looks to be cut by the head of (2) and the chest of (3).

2A: (largest horse with clear head and proximate to (1)). The head of (2) looks to cut through the antlers and neck of (1), suggesting (2) is younger. It is probable that an additional horse (4) is stacked behind (2), utilising its body plan. The ear is long and exaggerated, perhaps to recycle features of the antlers of (1). The ear has been drawn from the base to the point. The front of the face line meets the base of the line of the front of the ear and look to have been drawn from top to bottom. The eye is a complex arrangement of lines and seems quite different to the other eyes depicted. It is framed by an upper and lower line to give the top and bottom. A line which cuts the bottom of the eye gives the pupil and two lines cut through the top line. Some lines beyond this arrangement look to be details that perhaps depict details of the fur. It is probable that the line of the face was drawn before the line of the ear. While the ear is large, the tail is definitely that of a horse. A possible line of the face (4) looks to be cut by the line of the face (2). As (4) relies on (2) for much of its body plan, (2) could be corrections to (4)? The nose of (2) looks to cut through the neck of (1). The face is less obvious around this area there looks to be a line for a mouth and a nostril. The underside of the jaw is composed of a number of fine lines suggesting fur rather than a single line. There looks to have been drawn from top to bottom (from top of the head towards the muzzle).

2B: the line of the back is somewhat indistinct around the back of the head and the neck but becomes clearer and with deeper engraving towards the rear and the rump. A series of short lines at a forward pointing angle form a clear mane for (2). These lines seem to have been worked from bottom to top. The line of the back looks to have been disrupted by the

head of (3), suggesting (2) is older. The back/rump of (2) looks to have been recycled by (3). The occasional horizontal line cuts through the mane, perhaps suggesting the mane was drawn first. The line of the back has been drawn from right to left. Likely that (3) is younger (2). The lines of the back/rump are multiple and wider, perhaps suggesting a different technique was used and this is also present in (3).

2C: the line of the tail continues on from the lines of the back/rump suggesting it was drawn at the same time as the back. The lines of the tail are multiple and look to have been drawn from top to bottom. The tail is given a bushy, hairy character by virtue of this technique. The bottom of the tail looks to have been drawn after the line of the back of the back of the leg, suggesting the leg was drawn first.

2D: the back of the back leg has been drawn using multiple lines, perhaps to give a sense of fluffiness. Numerous finer short lines which cut across this area look to try to achieve the same effect. The leg arrangement suggests (2) was drawn after (3), contra statements above. The finer lines referred to above belong to (3) and have been cut by the leg of (2). (2) recycles the rump and tail of (3). The line of the leg of (2) takes these features and extends the line from top to bottom to make it longer, at a different angle, cutting through the lower portion of the leg of (3). The leg runs to the edge of the piece with no hoof present. The front of the back of the leg looks to recycle the top of the leg of (3) but then break off to give a straighter leg and narrower lower leg. A line in front of this arrangement gives the background leg, drawn after the foreground leg using the scale and shape of the foreground.

2E: the line of the belly looks to have been drawn from right to left and connects in with the shared arrangement of the back of the leg of (2) and (3). The penis looks to cut through these lines and may be a later addition, perhaps suggesting its associations with (2), though it could equally be associated with (3). It seems to cut through the arrangement of lines forming the back of the front leg, suggesting the front leg was drawn before the line of the belly. the line of the belly cuts through the line of the front legs of (3), again suggesting (2) is older.

2F: the line of the neck and chest looks to have been worked from top to bottom. It is a little indistinct around the neck, perhaps elements of the body plan of (3) being recycled.

The line of the chest is cut by the line of the leg, also worked from top to bottom, with a curving line giving some definition to the connection between the top of the leg and chest. The line of the front leg looks to run all the way to the edge of the piece where it is disrupted by a small chip that is later and likely removed some of the detail. A line that branches from the line of the front leg may be an attempt to depict the background leg, using the foreground leg to shape the shape and size of the background. This is accompanied by a line that connects to the belly line that would give the back of the background leg. However, this arrangement could belong to the background leg of (4), recycling the line of the belly of (2)? The line of the back of the front leg again gives some detail to the upper body before running down to meet the front of the front leg to give a narrow leg profile, possibly disrupted by the small chip to the edge of the piece. Two lines forming a 'v' shape may be the background leg for (2). This arrangement is worked from top to bottom, with the lines converging towards a sharp point. This parallels the foreground leg which is also narrow.

3A: the head of (3) looks to be somewhat disrupted by the arrangement of the neck and mane of (2), suggesting (3) is older. The eye looks to have been formed by a top and a bottom portion to form an ellipse. An additional line above and below give an extra detail around the eye. The ears area again quite long, as in (2), but the tail is hairy and horse-like. The ears were likely drawn from base to tip and look to be cut by the line of the neck, perhaps suggesting they were drawn before the line of the back. However, the ink is quite heavy in this area making it difficult to be sure. The line of the face looks to have been drawn from top to bottom and a new line used to achieve the curved line around the muzzle. The muzzle looks like it may have been drawn twice, with the arrangement giving a longer face likely coming after the initial line of the face which would yield a shorter face. The underside of the face isn't a continuous line but instead a series of short lines that collectively give fur and a 'beard'. They look to have been drawn from the top (towards the face) to bottom (away from the face).

3B: the line of the neck/chest runs down into the line of the foreground leg. The line of the chest of (3) cuts the back of (1), suggesting (3) is younger. The line of the neck/chest/leg looks to have been drawn from top to bottom. The leg which is stretched back in movement is actually the foreground leg.

3C: both the foreground and background legs have been depicted and they are in a dynamic position suggesting movement. The front of the foreground leg connects directly to the line of the neck/chest and was drawn from top to bottom. The hoof is very round and is more akin to the bottom of the hoof than the side. It looks to have been drawn from the front in a line around to the back. It is probable that the back of the leg was drawn before the line of the belly which looks to cut the line of the leg. The back of the leg has been drawn with multiple lines which feather and flick outwards to give a furriness of the hoof. This runs on beyond the upper line of the hoof but doesn't contact it, suggesting the hoof was drawn earlier along with the front line of the leg. The background leg also contacts the line of the belly (in error – this shouldn't be visible). The front of the background leg branches from the front of the foreground leg running to give a more static leg relative to the foreground. The front of the leg has been made with multiple lines. These lines look to cut the line of the belly of (1), again suggesting (1) is older than (3). A hoof has been drawn in the same arrangement as seen in the foreground leg, though the hoof is more realistic. The back of the background leg looks to have been drawn from top to bottom with multiple lines and again these lines feather and flick out to give a hairy hoof. The hoof was likely drawn with the foreground portion of the leg.

3D: the line of the belly looks to cut the line of the front leg but is cut by the line of the back leg, suggesting a likely order of front leg, belly, back leg. The line of the belly has been drawn with multiple lines and worked from right to left. Cross hatching is present to the belly and is likely depicting fur and have been achieved in a similar way to No. 664. The penis cuts the line of the belly of (3) and is likely associated with this depiction.

3E: a foreground and background leg is again depicted and in a similarly dynamic position to the front legs. The front of the foreground leg has been drawn from top to bottom with multiple lines. The area between the back and front line of the foreground leg has been filled by short vertical lines drawn from top to bottom to give fur. The line of the leg gently curves and runs to the edges of the piece. The back of the foreground leg has been recycled by (2) and drawn over but looks to have been composed of numerous short lines, cut by the line of the tail, that collectively give a furry effect to the back of the leg. Each short line is roughly a diagonal and drawn from top to bottom. The mid portion of the leg is more conventional in using a single line before the bottom of the leg and hoof is made up of multiple diagonal lines, again giving a furriness.

3F: the tail and rump is described in 2C.

3G: the line of the back moves from a single finer line around the neck and upper back through to a deeper series of lines for the back proper, perhaps suggesting different techniques were used along the back to give different effects. The line of the back looks to run beyond and through the ears, is less distinct around the neck, before wider and deeper lines are used. The working was likely from left to right. A series of marks may be associated with (3) (or (2)) and would give fur. They are slightly curved, feature in a localised and worked from top to bottom.

4: looks to be associated with the body plan of (2). Only the line of the face, chest and front legs are present. This suggests an animal walking close to and slightly in front of (2), and is a probable case of 'stacking', perhaps to depict herd behaviour.

4A: a single line which may be the front of the face, cutting and emanating from the face of (2). There may be some additional lines giving the beginning of the muzzle.

4B: the line of the chest looks to have been drawn from top to bottom, mirroring the shape of (2). The line of the front of the legs looks to be drawn from top to bottom and runs almost to the edge of the piece. There is no obvious sign of a hoof. This could well be the line of the foreground leg. The back of the leg is similarly drawn from top to bottom. The background leg has similarly been drawn from top to bottom and with no sign of any hoof. Both legs are left with open stumps.

4C: there is a possible line of the belly but this is difficult to assess as it is fine and ink is present in the groove. It looks to cut across the legs of (2) but it is not clear if it cuts the line of the legs. This line may simply be fortuitous and doesn't seem to be associated with any broader elements of the design.

Plaque no. 692

It looks like an animal has been drawn twice, with tail and legs in lowered and elevated positions, all treated as one design.

1A: the head is largely lost to a later break, possibly as a result of heating. The ear and lower portion of the muzzle and jaw remain. The line of the muzzle may have been worked from left to right. A mouth has been drawn and is open and with a possible nostril. A line of the chest meets the line of the jaw and looks to have been drawn from top to bottom. A large ear is also depicted and has been drawn from base to tip of the ear. The line of the chest projects and cuts through the remnants of the head, suggesting there may have been an additional head depicted at one point. There is an additional stray line below the line of the jaw, worked from left to right, but this doesn't seem to be part of a broader design.

1B: the line cutting through the arrangement of the head seems to connect to the foreground front leg which has been drawn from top to bottom. This progresses into a curved leg where new lines have been used to achieve the bend in the leg. This arrangement of bent legs looks to be cut by a series of straight lines that give most schematic straight legs. This suggests the bent legs were drawn first. The hoof may have been drawn with the front portion of the leg. The connection to the back of the leg is disrupted by an additional line giving the straight legs that were also drawn later. The back of the leg looks to have been drawn from top to bottom and has been cut by the line of the belly, suggesting the legs were drawn first. The front background leg was drawn after the foreground leg as it looks to cut across the lines of the foreground leg. The leg was drawn from top to bottom. The hoof looks to have been drawn in the same way as the foreground hoof. Some fine feathered lines from the main branch of the back line of the leg may suggest an attempt to depict furriness. The back of the background leg recycles some elements of the foreground leg, confirming the order of engraving. The vertical lines which cut these legs give possible schematized legs in a more static position, drawn after the bent legs, and left with open stumps rather than hooves.

1C: the line of the belly runs from right to left and was likely drawn after the line of the front legs. The line is relatively straight but flicks up at the connection with the back legs to give an arched effect between belly and back leg. There is a second line of the belly lower down, likely belonging to the more static depiction and joining the static front legs to the static back legs. In both cases, the line of the back legs cuts the line of the belly and the line of the belly cuts the line of the front leg. The lower line of the belly (static depiction) is slightly more dynamic, the line curving to give some definition. There are some short, fine

feathered lines running across the gap between the two lines of the belly. This may be an attempt to depict furriness to the more static design.

There may be as many as three rumps and three sets of back legs depicted. The upper most line of the back seems to correspond with the line of the chest that cuts through the head of (1). This would suggest the head is missing. The depiction seems to have tail pointed downwards and this design may tie in with the static legs. There are two depictions with an upturned tail and they seem to fit in with legs pointing backwards and forwards respectively. These both may be associated with (1) and tie in with a dynamic stacking of the same animal. The downturned tail may have longer projections in which case it may be a horse. Still the possibility they all belong to (1).

1D: the back legs of (1) seem to be those which project backwards. The upper portion of the front leg looks to cut the line of the belly. The rump further to the left with upturned tail (2) looks to clearly mirror (1) and seems to connect to the forward pointing legs. (3), the static depiction likely corresponds with downward pointing static and schematic legs. The line that connects to the upper belly line is used by the front line of the leg of both (1) and (3) and both look to have been worked from top to bottom. Confirmed, the backward pointing leg is connected to the first of the two rumps with upward pointing tail. Both the front and the back leg looks to have been drawn from top to bottom and terminate in an open stump close to the edge of the piece. The second rump of (1) and (2) also look to have been drawn from top to bottom and turn into a backward projecting leg. The two rumps may correspond with the background and foreground legs of (1) respectively? The forward pointing leg skirting the edge looks to cut through the long, straight, static legs of (3). This forward pointing leg is odd and doesn't seem to connect to anything to make anatomical sense. It is presumably linked with (1) and (2).

1E: the back of (1) looks to join with the base of the ear and may have been drawn after the ear. The back has been made by a number of sinuous wide lines likely working from right to left. Towards the rump the back starts to split into two, the top line looking much the same and the bottom line looking narrower and perhaps deeper. These lines look to run across to the downward projecting tail. It looks to be cut by the first upturned tail and second upturned tail. The upper line of the back likely belongs to (3) and has been disrupted by a break to the far edge. The back is composed of numerous lines and are wide, much like the

lines of the back of (1). Again similar to (1), this seems to split into two towards the rump. These lines look to skirt around the first upturned tail but interact directly with the second upturned tail (furthest to the left). This line seems to continue on towards the downward tail.

1F: a series of fine, slightly curved lines drawn from top to bottom runs across the flank of both leg/rump arrangements, likely depicting fur across the leg and suggesting these two are likely associated. The lines of the upturned tail look to have been worked from bottom to top (towards to away from the body). The back of the leg connects to the back of the tail in both cases and looks to have been drawn after the tail and from top to bottom. There may be a connecting line between the back of the right rump (1) and the anomalous forward projecting leg, cut by the backward pointing arrangement. The left upturned tail looks to cut the downturned tail, suggesting this is older and, if it is associated with (3) that (3) may also be older. The straight lines of the likely legs of (3) were drawn top to bottom and don't seem to form any hoof arrangement.

Plaque no. 693

1: line skirting the edge, likely disrupted by breakage and so now in two parts but likely a continuous line. The almost wave-like pattern suggests these belong together. The 'wave' pattern look to cut a linear line and skirt the edge before gradually changing and moving towards the centre of the piece. These lines look to be late and cut everything they pass through, the lines may have been worked from left to right. A localised group of two lines forms one 'wave' before there is a break at the edge of the raw material. The shape of the raw material here would actually work as the next wave and perhaps be incorporated to this effect. The engraving does look to be different after the break. There are two attempts to start the line before a third mark at a different angle starts the line and incorporates the other two. Potentially worked from left to right. New lines are used to achieve the steep curvature of the 'waves'. A line stemming from the rectangular arrangement looks to cut the line of the waves suggesting it at least is younger than the wave arrangement. An additional 'wave' breaks off at a different angle here and is made in the same way and looks to be worked from left to right. An additional line breaks off slightly further along, taking the design to the top of the edge, again worked left to right. The line is non-continuous but looks to recommence to take the pattern to the top edge.

2: may be the head of an ibex. If the connection between (1) are correct, that entire arrangement feature after (2). Minimally, the 'wave' running across the muzzle/mouth of (2) is younger. A prominent eye has been made with numerous lines, each line terminates and the next changes orientation to give an angular but round effect. A series of fine short lines in roughly the position of the neck may be the depiction of hair and an attempt to depict furriness. These lines were drawn from base to tip (towards the body to away from the body). There is a line drawn over the eye running horizontally and drawn from muzzle end towards the back of the head. The front of the muzzle has been cut by lines skirting the bottom edge (1) suggesting (2) is older. Both the top and the bottom of the head look to have been drawn from the back of the head towards the muzzle. The muzzle seems to project towards the edge of the piece, giving a design out of proportion. A possible ear is depicted, drawn from the base of the front of the ear up and around to the top where another line runs from top to bottom and projects beyond the ear, at an angle and curving, to give the back of the head and perhaps some of the neck. Lines project from the back of the head and perhaps some of the neck. Lines project from the back of the head and may be the horns. They look to be drawn from the base where they attach to the head, gradually curve and run over the edge of the piece. They do not connect at the top of the horns, leaving some doubt about what these lines are. There doesn't seem to be any broader design present.

3: a strange, curving, rectangular feature sits to the centre of the piece. It is anthropogenic but doesn't seem to be part of any larger design. This arrangement is composed of four main lines. The line to the left has been drawn from top to bottom. It doesn't directly interact with the top or bottom lines and curves away under the eye of (2). The bottom line was likely drawn from right to left and is cut by several vertical lines along its length suggesting this arrangement is amongst the older designs. The right edge is composed of two lines. They cut through the bottom line and the top line. The top line looks to have been drawn from right to left. There is a connection between the top line and the left line, a small looped structure almost like an ear. No broader design is evident.

4: the furriness of the neck may also be associated with the possible line of the back of an animal. The shape of the line that sweeps over the edge is a bison. However, no broader design can be discerned. The line has likely been worked from right to left and consists of a longer, more gradually curving line along with a shorter and more steeply curving line that

follows. This might well be consistent with the back of a bison but it is difficult to be sure without any further elements of the design.

Additional: other lines are present on the surface and look to be anthropogenic but don't seem to form any design.

Plaque no. 694

1: possible human figure in sitting position. The top of the back stops just short of a set of arms at 90 degrees (2) to the line of the back. The back has been drawn from top to bottom with multiple closely packed lines. This line curves gradually before turning sharply into the buttocks. A series of lines runs out from the buttocks running to the edge of the piece. This straighter arrangement looks to have been before the line that curves to give the sitting posture. The line that continues on and curves to give the buttocks is deeper and narrower by comparison and looks to have employed a different technique. Probable direction of working is right to left. The upper portion of the leg looks to have been drawn from right to left. The line of the chest may have been drawn from bottom to top (contact with legs) to top though there is heavy sediment salt in this location. There may be some detail running across the leg perhaps supporting that this is a human figure. This takes the form of two lines that run across the width of the leg with a series of lines that between these two lines to give some kind of clothing/decorative feature? This continues on beyond the line of the leg in a series of dashes to form an almost tail-like structure with the extended line from the buttocks. Could this be a schematic animal when turned 90 degrees anti clockwise from present orientation?

2: pair of legs/arms of ambiguous species. They are similar to No. 663 in that they have long projecting 'fingers'. They may be schematic human features on this basis? They don't seem to be connected to a broader design. It is probable that the back leg was drawn first followed by the front leg. The back of the front leg cuts the front of the back leg. The front of the back leg looks to have been drawn from top to bottom. The fingers have also been drawn from top to bottom in each case. The line order between front and back of fingers can't be discerned as there is too much sediment within grooves. The back of the back leg may be associated with a line that projects up to give the upper thigh with a possible long, wide tail. This is present on the 3D model. This may be fortuitous as the back line of the tail runs on considerably. The back of the leg has likely been drawn from top to bottom and

ends in angular lines to give a square joint to the back of the hand/paw. The front leg was likely drawn after the back leg. This would likely make the front leg the background leg if the depiction follows the rule observed in animal depictions. The front leg looks to have been drawn in much the same way as the foreground leg, from top to bottom. It again seems to display an angular back to the hand/paw.

3: possible cervid head with antlers. The animal is not complete and so the arrangement may be fortuitous. No detail beyond head, antlers, chest and back. The front of the face looks to have been worked from top to bottom (towards muzzle). The front of the antler looks to have been worked from base to tip and the line runs to the edge for both the antler and face. The back of the front pointing antler again has been worked base to tip and runs to the edge of the piece. The underside of the face looks to have been drawn from the back of the jaw to the muzzle. A line cut by the jaw may be the neck, though it runs beyond the line of the jaw and appears to be older suggesting it may be fortuitous. A line projecting may be an additional antler to the back of the head, again drawn from base to tip. However, this may be the line of the head of a possible horse (4). There is no clear back to the antler perhaps suggesting the view that this is part of a horse. The line of the back runs from the back of the antler roughly following the shape of the edge of the piece and running down towards the bottom of the piece. There may be a very faint eye present but this is difficult to see. It does appear on the 3D model and it doesn't rely on any natural features. The line of the back of (3) looks to cut through the line of the buttocks of (1), suggesting (3) is younger than (1).

4: unlikely to be real. It is reliant on extended elements of (1) to give a mane, possibly reliant on (3) for the face and seems to possess no other independent features. This is likely fortuitous. In this case, the backward projecting line is an antler for (3).

5: looks almost like a horn. This may be fortuitous given the high quantity of engraving across the surface. However, the relationship looks quite specific. The lines don't seem to be part of a broader design. There is almost certainly a red ochre patch spread across and around this arrangement. They didn't seem to be a part of the design even with orientation of the piece. The ochre was applied after the engraving. The two curving lines looks to have been worked from base to point and has a number of lines one to the other running across the gap. These look to be older. No interaction with the other designs.

Additional: there are other additional lines that look o be anthropogenic but don't form any sort of pattern.

Plaque no. 695

Large flat piece with a horse and likely an immature cervid. Both animals seem o possess a fairly unique style, depicting movement and with different head expressions.

1A: the piece looks to use the top and side edges to form the piece. There was plenty of room on the support but the corner has been chosen explicitly. The top edge has been more directly incorporated into the design, using gradual curvature of the edge to give the top of the neck/mane. This is accentuated by a line to give the lower portion of the neck/back. This line looks to have been worked from right to left.

1B: the line of the face and muzzle looks to have been drawn multiple times, with a wider, longer version of the face present. The line of the face looks to have been drawn from top to bottom from top of the head to the muzzle. The nose and mouth have also been depicted, the nose drawn in a curving line and perhaps too large for the scale of the piece. The mouth is drawn by an additional line drawn after the top of the line of the muzzle. The mouth is depicted as open and the lower portion of the mouth looks to have been drawn before the line of the lower jaw. The lower jaw looks to have been drawn from the front of the mouth. A feature dawn before the jaw is a curving loped feature that looks un-anatomical and drawn from base to tip. The back of the jaw looks to have been drawn from left to right. The eye looks to have been drawn with the main lines, two to the top of the eye and one forming the bottom of the eye. A line has also been drawn above the eye. The direction of working looks to have been from right to left and the eyebrow has been drawn from left to right. Some detail had been drawn behind the eyes and before the neck and likely represents some fur/detail.

1C: there are two main lines to the front of the neck and they look to have been drawn from top to bottom. These were likely drawn after the line of the jaw but they don't seem to directly interact. The line of the background front leg cuts the line of the longer of the two lines of the chest, suggesting the legs were drawn after the chest.

1D: the lines of the foreground leg have been drawn from top to bottom and run to the edge of the piece. The front line looks to change orientation at the far end perhaps suggesting an attempt to depict a hoof but this runs to the edge and is incomplete. The lines of the leg are interrupted by several later horizontal lines that seem to be part of an arrangement of lines not associated directly with (1). The background leg is in a more dynamic position, and along with open mouth, suggests an animal in motion, possibly running. The front line of the background leg cuts the chest and the front line of the foreground leg, confirming that the background leg was drawn after both. Multiple lines have been used to create each line of the front and background leg all drawn from top to bottom. The line of the chest runs on the edge of the piece and looks to have been drawn after the legs and from right to left.

2: looks to be a cervid of some kind, finely engraved and relatively naturalistic. There are no obvious antlers, perhaps suggesting a female or juvenile individual, depending on species.

2A: the head looks to be somewhat schematic and very faintly engraved. The ear is long and looks to project backwards. It runs across a natural break in the surface suggesting the break is older than the drawing. The ear looks to be drawn from the base towards the tip of the ear. This natural break may have been used somewhat to shape the head of the piece. The eye has been drawn with multiple lines to give a roughly round shape. An upper curving line that hooks underneath and back around itself may be an attempt to depict the head and incorporate the break, not entirely successfully. The lines directly below this do look to be an additional, more accurate, depiction of the face. The head looks to have been drawn from right to left and curved around the muzzle to give a line running into the chest. The line of the mouth is an additional line drawn after, drawn left to right.

2B: an angular arrangement of lines, almost forming two sides of a square, are present just below the line of the neck (2) but don't look to be directly linked to the design. the line of the neck looks to connect directly to the arrangement of the face and is drawn from left to right. A number of vertical lines cut and run down the chest and look to depict a tuft of fur. This has been found in depictions of reindeer elsewhere across the collection. A longer line which cuts through the line of the neck and seems to commence this arrangement has been drawn from top to bottom and may be the beginning of the chest. The fur seems to stop when it contacts an arrangement of longer lines that are likely a forward projecting leg.

2C: the arrangement of the legs may again depict an animal in motion, with one leg outstretched and another tucked behind. The leg that stretches forward is the background leg and seems to be composed of only the front component. A natural crack may perhaps act as the back of the leg but this may simply be fortuitous and there appears to be no signs of any direct modification of the crack. The line of the chest does project from the neck and into a line for the chest, leaving the arrangement of the fur (already described) as somewhat anomalous. The line of the forward projecting leg has likely been drawn from top to bottom and looks to cut the line of the belly. The bending leg, likely foreground, looks to have been drawn from top to bottom, using multiple lines to achieve the curve in the legs. The line of the leg terminate at the edge of the piece and there is no sign of any hoof depicted. There are two main lines to the front of the leg drawn just before the lines curves around at the knee an this could be an attempt to suggest a background leg in the same position or simply a repositioning of the original lines of the leg. The lines don't cross so it isn't possible to resolve line order which may have helped in this assessment.

2D: there is perhaps some suggestion of the belly. There is a fine uninked line likely drawn from left to right. An arrangement of vertical lines and inked, drawn from top to bottom, ma be an associated detail of the belly. However, this is difficult to assess due to fine horizontal banding in the raw material. It does seem to show up on the 3d model suggesting it is real despite this caveat. A series of lines may be the beginnings of a back leg, with two connecting lines at an appropriate angle and position for a leg and drawn from top to bottom.

2E: as noted above, there may be some suggestion of back legs. A natural crack runs through the piece with no signs of modification. Behind this is a possible back of a leg, perhaps using this crack as the front of the back leg. There doesn't seem to be any suggestion of the rump perhaps suggesting this is fortuitous.

2F: the line of the neck/back looks to have been drawn from left to right using multiple lines. There looks to be no broader elements to the design with no obvious rump or tail. There are a series of converging lines running from the top right corner towards the centre of the piece that cut the line of the back of (2), suggesting they are later. These lines don't seem to form part of a larger design and are anomalous, not belonging to (2).

3: bottom left corner also bears some engraving but a broader design isn't apparent. The engraving looks broadly head-like. There may be a mouth and muzzle. The line may begin around the top of the head and down and around into the neck down to what would be the neck. This doesn't seem to link up into any broader design.

Plaque no. 696

[there is no direct coverage for this piece via 3D model. Analysis proceeds with microscope only]. This piece is likely part of a large plaquettes. Designs seem to be disrupted to the edges and those edges are of a different colour to the obverse surface. A leg/h hoof is depicted and this seems to occupy the centre of the piece and may have been part of a broader design. This looks like the hoof of a cervid or possible but less likely a bison.

1: the hoof and lower leg occupy a central position on the piece with other lines running across the surface that are unlikely to be related to the main design. the front of the leg looks to have been drawn from top to bottom in a fairly straight line before curving around to give the base of the hoof into the back of the hoof. The back of the hoof looks to have been drawn with multiple lines, suggesting it may have been drawn with the back of the leg rather than as part of the front. The back of the leg looks to have been drawn from top to bottom. There is a group of shorter lines, drawn from top to bottom, that likely depict fur. A series of similar dashed lines seem to run in from the top left edge and might be a part of the back leg. This series of lines were drawn from top to bottom which would be consistent with the back of the leg within a broader ungulate body plan.

Additional: there are other lines across the surface but they don't appear to be part of the design of (1). The surface looks to be heavily eroded and may have lost some additional details as a result. A series of horizontal lines running across the surface are younger than (1), cutting the lines of the upper leg. These lines also cut the short lines that were previously suggested to be the back of the upper portion of the back of the leg, perhaps supporting this position. These horizontal lines do seem to be anthropogenic, with those not running to both edges having been drawn from left to right. Some horizontal details to the top point of the piece could feasibly be part of the belly to a much larger animal depiction, with breaks to the raw material on both sides. All lines in this region run over to the edge. It is difficult to be sure without any clear connection to other elements of (1) and

so this possibility must remain speculative. Other lines on the surface look to be anthropogenic but don't obviously connect into (1) or any other clear depiction.

Plaque no. 697

1: a set of cervid legs seemingly disrupted by fragmentation of the piece. The surface looks to be heavily eroded in places and with a high sediment load making analysis challenging. Multiple lines have been used to make the back of the leg to the right. It has likely been worked from top to bottom. The top and bottom edges look to be more recent breaks. A 'v' shaped arrangement gives the back of the hoof and the bottom of the front of the hoof and was likely drawn from top to bottom. The front of the leg to the right cuts the back of the hoof to the left, suggesting the left leg was likely drawn first. If this piece follows broader convention, this may suggest that the leg to the left is the foreground leg and the leg to the right is the background leg. The front line of the leg looks to have been drawn from top to bottom, curving around to give the bottom of the hoof. The hoof is cleft, suggesting a cervid, with a line of the cleft drawn from top to bottom and likely after the outline of the front of the hoof. A curving line, composed of several closely packed lines looks to have been drawn before both legs. The upper parts of both legs cut this curving line. The left leg looks very similar to the right leg and they look to have been made in much the same way. The main lines of the front and back of the leg look to have been drawn from top to bottom and are potentially disrupted by the break on the top edge, though this is more difficult to assess due to the generally fine engraving and eroded surface. The spur to the back of the hoof has been drawn with two lines that were drawn from the base to the tip in both cases. A gap has been left in the outline in both legs for this feature suggesting it was drawn as part of and in sequence with the broader arrangement of the back of the leg. The broader hoof looks to have been composed in the same fashion as in the right hoof. The curving line cut by the legs may be associated with this design but it is difficult to see what anatomical feature this depicts.

2: a long, fine, vertical, curving line runs from top to bottom and may be associated with the antler-like arrangement that looks to cut this line. The antler like arrangement does look to have been composed much like an antler. The main beam has been drawn from right to left and each tine looks to have been drawn from base to tip in each case. This doesn't seem to be part of a broader design. Perhaps a broader design has been lost due to breakage but the remnants aren't immediately discernable to the remaining plaque.

Some localised lines drawn from top to bottom between (1) and (2) and to the left of the curving line perhaps associated with (1) could be associated with (2) but it is difficult to be sure without direction to the broader arrangement of (2).

Plaque No. 698

1: the body plan of (1) most resembles a horse but the tail looks more cervid-like and is certainly not consistent with a horse. On balance, the depiction is most likely to be that of a horse.

1A: the line of the back closely mirrors the shape of a naturally eroded step in the raw material which gives a curving line proximate to the shape of the back. The line of the back looks to have been drawn from right to left. It may rely on a natural fracture to give the upper portion of the neck. It seems very much in line with this feature and would work well anatomically. Some short, vertical lines emanating from this crack may be an attempt to depict a mane. The far end of the back is met by a short, upward pointing tail which looks to cut the line of the back, suggesting the tail was drawn after the back.

1B: the lines of the back and belly look to project on beyond the line of the rump, suggesting there may have been some modification to the design. The outer line of the back would be more reliant on the eroded step to give the line of the back. The line of the rump looks to be the same as the back of the tail and was likely drawn from top to bottom. The line of the rump continues down to the edge of the piece to give part of the leg.

1C: an additional series of lines have been drawn from top to bottom and run to the edge and give dynamically positioned back legs. These lines look to cut through the elongated belly line that runs to the edge of the piece. This would suggest that the large design (2) was drawn before the smaller design (1) and that these may be separate designs that are stacked and with heavy recycling of the same design that has been reconfigured.

1D: a number of short, fine lines run across the inner area of (1). These likely depict fur. There is no prevailing directionality to these lines but they do look to be anthropogenic. The line of the belly looks to have been drawn from right to left and is a wider line with internal striations. It is composed of two main lines, the latter of which runs in from the bottom edge and runs to the left edge, giving the extended belly line of (2).

1E: the front legs look to be 'v' shaped arrangements, drawn from top to bottom in all cases. They were likely drawn before the line of the belly. The back legs look to belong to (1) but the line of the chest curves to the right and runs off the edge, perhaps giving the leg of (2). There may be some attempt to use a protrusion in the raw material here as an extension of the legs and to make the legs more dynamic. The line of the chest looks to have been drawn from top to bottom.

1F: the inner arrangement looks to give the head of something like an ibex, which would be consistent with the tail of (1). The line of the back here is also cut by some vertical lines that may be depicting fur. A line to the edge may be the front of the face of (2).

Additional: some additional lines to the top of edge and the right are likely anthropogenic and could possibly be part of an animal design but elements don't connect into a coherent design.

1: the upper portion of the leg may have been disrupted by breakage and could be part of a broader design. Difficult to be sure and this possibility seems less likely in this case. The lines of the front and the back of the leg have likely been drawn from top to bottom. Some shorter, vertical lines in the same orientation as the legs likely depict fur. The front line of the leg looks to run straight into a curving line to give the hoof. Upper lines of the legs does not look to be disturbed by a break – they look to begin below the line of the top edge. The hoof connects to the bottom of the front line of the leg and looks to have been drawn from left to right. The back of the hoof has a line drawn from bottom to top and this does not join with the line of the back of the leg which sits inside this arrangement and doesn't directly connect. The finer lines to the top of the leg look to have been drawn from top to bottom. An arrangement of fine lines that look to depict fur have been disrupted by the line of the leg.

2: this may be elements of a face. Some fine lines that may be fur have been cut by (1). Perhaps suggesting this arrangement is older. There looks to be an eye drawn with two main lines to yield a roughly circular shape. A deep, curving line, drawn from bottom to top may be the suggestion of an ear. However, not all of these components directly interact and so this is speculative. There looks to be an additional ear depicted.

3: this region is composed by four main groups of short dashed lines all drawn from right to left (top to bottom). These look fairly uniform and were likely made with the same tool. There is a round feature which looks a little like an eye but there doesn't seem to be a broader body plan and this may simply be fortuitous. Two longer lines in the same orientation and with the same direction of working may be a leg. A line drawn horizontally from this arrangement and worked left to right might possibly be the line of the belly but this is more tentative. If these observations are correct, the series of lines may be depicting fur of this unfinished (?) design. A long line looks to cut through the bottom of the hoof of (1), the eye of (2), and continue on into the arrangement of (3). Its significance isn't immediately apparent.

Plaque no. 699

Small, thin fragment with a sparse arrangement of lines. No obvious design present. The lines present do look to be anthropogenic. Some longer, parallel are veins of another material running through the limestone. The piece looks to have been burned and may be a fragment of a larger block. The surface looks quite badly eroded and some detail may have been lost.

A curving line to the top edge is composed of numerous short lines and look to be drawn from top to bottom before the line tapers away towards the upper left corner. A line running left to right runs close to but does not connect with this arrangement. This line looks to run on to the top edge. The clearest evidence of engraving is in the form of two sets of curving lines running over the left edge. These lines look to have been drawn from right to left. They don't seem to connect to a broader body plan, neither do they form a clear design or body element in their own right. The 3D model reveals some details around the bottom left corner. These are anthropogenic and linear lines look to have been worked from top left to bottom right. No obvious design emerges from these lines. A line running parallel to the right edge looks to have been drawn from top to bottom but again doesn't seem to be part of a larger design. no additional details are evident with the 3D model.

Plaque no. 700

a small, fragmented piece of non-limestone material with disrupted anthropogenic design. This may be part of an animal but the piece is fragmented to the point that it renders

interpretations ambiguous. A series of curving lines runs from top to bottom to the wider end of the piece. The lines look to have been drawn from top to bottom. These lines look to be cut at around the mid point a line running diagonally across the piece. A series of parallel diagonal lines, deeply engraved, occupy much of the space. The profile of these lines look similar and they were likely made at the same time. They look to have been drawn from left to right in each case. A later line looks to cut through some of these lines to the bottom edge, suggesting this is later. However, the profile of this line is deep and wide and while there is no associated colour difference, perhaps this may be modern excavation damage. With that said some of the engraving elsewhere is quite deep and this may simply reflect the use of different technique or may be linked to different properties of the raw material. This group of lines looks to be bracketed by a vertical line that has been drawn from top to bottom. It is probable that this line was drawn before the diagonal lines to the centre of the piece as one of the diagonal lines cuts over the top of the vertical line. An additional line towards the left edge looks to have been drawn from top to bottom. This may join to a diagonal line running in a similar orientation as the central group of diagonals to give a pointed projection where the two lines meet. The piece is too fragmented to be able to discern the nature of the design. The remaining components are not in themselves diagnostic of a broader animal design. The possibility remains that this is an abstract arrangement. This may depict the rear and back leg with fur in profile.

Plaque no. 701

Heavily fragmented, rounded limestone pebble likely fragmented via heating. Engraving is present to both the obverse and reverse surfaces. To the obverse is heavily disrupted depiction of a horse, with only the rear portion of the upper back legs and tail remaining. The reverse is more heavily decorated but a design is not immediately apparent. Clear traces of heat fracture to the broken surface. The obverse and reverse are not connected and so there is no wrapping around of details from one surface to the other.

1: upper flank of the back legs with the end of the tail and the back of the line of the belly connecting to the back of the line of the belly. Both the foreground and background legs are depicted. The foreground leg looks to have been depicted in a more static position and the background leg is slightly projecting, suggesting an animal in motion. The line of the belly looks to have been drawn before the line of the leg, perhaps suggesting the piece conformed to the broader body plan seen in other horses across the collection. The lines of

the foreground leg look to have been drawn from top to bottom and multiple lines have been used to produce both the front and the back line. The line of the tail does not directly interact with the line of the leg as the upper portion of the leg/rump is lost. The arrangement of the tail suggests the depiction is of a horse. The lines of the background leg look to have been drawn after the lines of the foreground leg and the leg has been positioned and scaled in relation to the foreground leg. The surface is quite sharply curving and there are other anthropogenic lines to the obverse but they don't seem to be connected to (1). The lines of the foreground leg have been drawn from top to bottom. The lines don't look disrupted perhaps suggesting the piece was broken before decoration. The background leg does look to have been drawn after the foreground. The line of the belly looks to have been drawn after the legs. The back of the foreground leg looks to have been drawn from top to bottom. The lines of the tail were drawn from top to bottom. The line of the belly looks to have been drawn from right to left. Some curving lines to the upper flank may be associated with (1) and look to have been drawn from right to left.

2: an arrangement of lines to the obverse across the other side of the rise in the raw material. They look to be anthropogenic but are not obviously associated with (1), nor do they form a clear design in their own right. The prevailing direction of working is from top o bottom (orientation of 3D model still), or left to right in relation to (1).

Reverse: a design to the reverse surface is not immediately apparent though the lines do seem to be anthropogenic. There is no supporting Sieveking diagram for this surface. There are some concretions to the surface and these look to disrupt design in localised areas. Neither does the arrangement form any localised patterns. This could be a result of breakage to the piece and corresponding disruption to design. There may be an anthropomorphic hand design to the concave part of the surface. Somewhat difficult to be sure as this area is especially covered in concretions, resulting in some loss of designs. This anthropomorphic arm is reminiscent of No. 663 and No. 694. Might a lack of diagram by Sieveking suggest a lot of these lines are natural? The 'arm' looks to have been drawn from the edge towards the centre of the piece or from the upper portion of the arm to the fingers. This does look like an arm/paw under the microscope. The fingers have similarly been drawn from top to bottom in each case. This arm looks to be cut by an arrangement of lines running across the upper arm, suggesting the arm was drawn first. A series of curving lines seem to follow and outline the concavity in the raw material, though it

doesn't seem to form any design. Some lines that fringe the edge around this arrangement look to have been drawn from the edge towards the inner surface. These lines look to have been primarily worked from top to bottom (using the orientation of the 3D still). These lines are disrupted to the bottom edge by chipping. The lines to the convex portion look to have been worked from left to right (longer lines skirting the bottom edge) and top to bottom (convex to concave) in those diagonal lines that look to merge with the arrangement of lines that form the lines that trace the concave/convex boundary.

Plaque no. 702

Small, kite shaped fragment of non-limestone material, the same as No. 700, with engraving across the surface that doesn't seem to form any clear design. There is close resonance between the Sieveking diagram and the 3D model. It is possible that designs have been disrupted due to breakage [working from left to right across the surface]. To the very left corner four lines run vertically across the piece. They have likely been disrupted by a chip to the top edge and were likely worked from top to bottom. A horizontal line looks to cut through these lines and was likely worked right to left. The curving line running from centre to left edge and lying above the line just described looks to have been drawn from right to left with multiple lines. It looks to be cut by a curving line that runs from top to bottom. A vertical, curving line seems to stem from this curving horizontal and has been drawn from top to bottom towards the bottom edge. The curving line turning through the centre of the piece looks to be composed of two main lines drawn from top to bottom in both cases. These lines are partly filled by an orange/brown, fine grained sediment. A series of fine lines look similar to lines drawn to depict fur, though longer, and have been drawn diagonally from right to left. A small wide 'v' shaped arrangement meets the top edge and has been drawn from top to bottom. An arrangement of two lines with short angular connecting lines finishes the piece. These lines look to have been drawn from right to left in both cases and the longer of the two has been drawn with several lines. There would appear to be no clear design to this surface, and while clear, the engraving is abstract.

Plaque no. 703

Large, rounded, triangular pebble, heavily encrusted with concretions across the surface. Anthropogenic lines are present and run across the obverse and onto the edges. Relative to the size of the piece, the engraving is sparse and doesn't seem to form a clear design. The lines do appear to be anthropogenic. Note, there is no back to the 3D model and some

lines may not have 3D model coverage as a result. There looks to be a close relationship between Sieveking's diagram and the 3D model. Some of the engraving looks to cut through some of the concretions, suggesting at least some of the concretions were already present before engraving took place. No obvious design emerges from these lines. The arrangement of the left centre looks to have been drawn from bottom to top. A new line is used at the transition from the edge to the obverse surface. The edge was likely worked first and in the same orientation. At the mid-point of the obverse the line branches into a finer web of lines. These finer lines also look to have been worked from bottom to top. The line immediately to the left looks to have been worked from top to bottom. These lines are contacted by a series that run across the piece. While the engraving is quite deep and lines fairly easy to see, line order is difficult to establish due to the texture of the raw material. The lines have most likely been worked from left to right. The line stops before the edge but an additional line continues over the edge, likely worked in the same orientation. A line skirting the right edge looks to have been drawn from top to bottom. A curved series of lines proximate to the right edge looks to have been drawn from right to left/top to bottom with a new line used to achieve the curve. The almost crack-like line running along the right edge looks to cut this curving arrangement suggesting it is older. Across the bottom edge a double line runs from the mid-point up and to the right. This looks to be anthropogenic and is the likely direction of working. This assessment is made from the 3D model only. This appears to be the full extent of engraving and no obvious design emerged from it.

Plaque no. 704

Small, fragmented piece with angular breaks to 4 edges and a rounded long edge to give a pentagonal shape. There is no major colour difference suggesting all breaks are old. A localised pitted area to the obverse may point to some localised solution. There looks to be good resonance between the Sieveking diagram and the 3D model. Several lines run horizontally across the piece towards the pointed base. These lines run to the very right edge and look to have been disrupted by breakage. This would suggest that engraving occurred before breakage. Some localised patches of sediment overlay parts of the engraving. The bottom two of these lines run over onto the rounded edge and this may be the start point, suggesting working from left to right. The lines above this similarly look to have been worked from left to right. Each line looks to have been made with multiple strokes. Engraving to the top is more dense but worked in a similar orientation, appearing horizontal in this orientation. A group of lines curves up and around to the top right edge.

This region has many fine striations when viewed under the microscope, running in a vertical orientation. The curving line looks to cross some of the horizontal lines. The relationship is ambiguated by overlying sediment but it is likely that the curving line is later. The curving lines are composed of multiple lines and look to have been drawn from bottom to top. An arrangement to the centre of the top portion looks almost like a hand or paw. Long, linear lines terminate with three additional lines, drawn right to left, possibly used to mark fingers. If this is correct, it is difficult to see how this fits into a broader design. The linear associated with this arrangement has likely been drawn from right to left but has been partly disrupted by some deep, natural grooves. Turned 90 degrees could this feature be a wing possibly? The localised spot of erosion looks to have disrupted some of the lines to the top left, suggesting they are likely old and anthropogenic. A number of lines have likely been worked from the left edge towards the right, with disruption by the localised patch of erosion. An upper line runs from left to right and his is composed of multiple lines. A set of lines likely disrupted by the patch of erosion also is likely worked from left to right and looks to cut this upper line, suggesting it is later. A line below this but above the 'hand' is likely drawn left to right. It is likely later than the 'hand' as it looks to cut through the line of the long linear that is associated with it. A solitary line is present to the left edge to the middle of the piece. It runs slightly over the edge and has likely been worked from left to right (edge to centre). A crack runs vertically through the piece from the top edge and disrupts the horizontal lines. There is no clear design present to the surface in these lines.

Plaque no. 705

Small fragment with irregular edges and obverse surface, suggestive of breakage. Decoration is present in a localised area perhaps because some of the obverse surface has been lost. Some of the planes of breakage are suggestive of heating. The colouration of the piece supports heating. The decorated area corresponds with the heated area (area with obvious colour change). A prominent line runs from the bottom left edge and is composed of multiple lines, likely worked from left to right. A localised area to the bottom left has a rougher surface texture and this may have caused some localised disruption. A number of short lines positioned above this horizontal look to be localised to the bottom left corner and have likely been drawn from top to bottom (centre towards the edge). The lines don't seem to interact and no broader design can be discerned.

The surface texture of the piece is quite granular and lines are difficult to detect and interpret. There seems to be good resonance between the Sieveking diagram and the 3D model, with no more lines depicted on the drawing. The pattern to the left bottom near the bottom edge is similarly composed of a series of short lines running in two main orientations. This forms something of a cross hatch pattern. The horizontal lines look to have been worked from left to right. It is difficult to tell line order in this region, partly due to the texture of the raw material. Working of the diagonal lines was likely from bottom left to top right (edge to centre). The lines don't seem to form any obvious design. The red colour does not present to the edges – could this be red ochre? Several additional lines are present directly above the discussed arrangements. This takes the form of two groups of two converging lines which join to give an upside down almost schematic leg. This may be associated with a localised red patch which loosely follows the orientation. These arrangements are likely worked from bottom to top and don't seem to be part of a broader design (these lines are present on Sieveking's diagram). Under the microscope, the red colourant looks appreciably different to orange sediment on other pieces, perhaps supporting the view that this is ochre.

Plaque no. 706

Large fragment, roughly trapezoidal with a long, irregular rounded edge and three angular edges likely caused by breakage. The surface is pink with dark patches and looks to have been heated. Engraving is localised to one end of the obverse surface. There is good resonance between 3D model and the Sieveking diagram. The engraving is present in two main groups and consists of primarily of long curvilinear lines. A single line runs from left to right diagonally and looks to have been drawn from top to bottom. A diagonal above this running at a shallower left/right alignment, and likely drawn in the same orientation, looks to be cut by a series of lines that contact the top right edge. There are four lines to this group, two deep and two shallow. They were likely drawn from left to right (centre to edge). The arrangement below is more complex with more lines but appears much the same, two groups of lines in different orientations. A series of roughly horizontal lines runs across the centre of the piece. The upper most of these run from left to right. This is cut by a line that cuts across it in the opposite orientation drawn from right to left. Near the start of the first line, a further line branches off and runs diagonally towards the edge of the piece, likely drawn from top to bottom (centre to edge). This line is likely later as it looks to marginally disrupt the initial line. The next two lines are relatively closely packed and look

to have likely been worked from right to left. The next group of two lines are longer and are similarly quite closely packed. The vertical line again looks to disrupt these lines cutting through the left end of the upper line. The lines have likely been worked from left to right. Two lines below the longer lines look to converge and form a 'v' shaped arrangement. These lines were clearly worked from left to right. These lines seem to cut a series of converging lines running at a steeper angle. The latter lines have been drawn from top to bottom. There is a series of lines running in opposite orientation giving a vaguely cross-hatch effect. A set to the right side of the arrangement converge and form a rough 'v' shape and were likely drawn from top to bottom. These lines look to cut through some of the lines of the upper arrangement. A long line to the left of the 'v' arrangement looks to have been drawn from top to bottom and being cut by a number of horizontals is likely older. A series of short lines in similar orientation looks to have been drawn from right to left and don't interact with any other lines no other lines are visible to the surface despite an excess of space left over. These lines don't seem to form any obvious design though the lines do appear to be anthropogenic. Could these lines represent the modification of a tool? There is a possible line of the front of the face into the nose/muzzle, ears and eye to the top corner. These look possible both with the 3D model and under the microscope. However, no broader design can be discerned. This arrangement does not feature fully on the Sieveking diagram.

Plaque no. 707

Well rounded pebble with no signs of breakage or burning. There seems to be modest anthropogenic activity to the obverse surface. The colouration is deep orange/brown. The engraving looks to be localised to the bottom edge of the obverse surface, marked by a few simple lines and with no broader design present. Lines are also present to the reverse side. Again, these don't seem to immediately form a design. at least some of these could be naturalistic. The piece is likely made from limestone. a line skirts the edge of the bottom edge in an almost wave-like pattern. The design is composed of multiple lines and they look to have been drawn from right to left. To the left the arrangement looks to fan into multiple finer lines that run towards the left edge of the piece. Again, these lines are composed from right to left. There is no clear sign on the 3D model of any further design. there may be the occasional line present to the surface via the microscope but these are not readily obvious to the 3D model.

Reverse: the reverse is darker in colour with some localised dark patches. Some engraving is present across the surface and some also around the bottom edge curving around the arch in the raw material. No design is apparent across this engraving. There is no supporting Sievekign diagram to the reverse for comparison. The lines to the reverse could just be natural scuffing, the deeper lines look to be in amongst shallower lines in the same orientation. The direction of 'working' in the group of lines running around the arch in the raw material were likely from right to left. A group to the right edge have similarly been drawn from right to left. A series of lines to the bottom edge look to have been drawn from right to left near the bottom edge of the piece. The diagonal line looks to cut through the horizontal line in this arrangement perhaps suggesting the diagonal line is later. A solitary line to the centre looks to have been drawn from top to bottom. There doesn't look to be any additional lines to the surface and there are no obvious designs to this arrangement of lines.

Plaque no. 708

Elongated, rounded river pebble with engraving on both obverse and reverse notching to one edge. There is evidence for an attempt to perforate the piece. This was unsuccessful/not completed, perhaps because the geology was too hard on the raw material. Some of the decoration cuts over the top of this perforation suggests the engraving was likely a later addition. A series of curving lines are evident to the obverse surface and are clearly discernable. They don't seem to form a readily recognisable larger design. The reverse has a series of diagonal lines running across the surface. A crack runs through the piece which is natural.

Reverse: the direction of working for the diagonal lines looks to have been from top to bottom left. Some of the lines are composed of multiple lines. Some of the upper lines are cut by a line running in opposite orientation drawn from top left to bottom right and likely drawn later than the main series running from top to bottom left. The lines run across the edge slightly to the right and the use of multiple lines likely gets around this and continues the line across the curving surface. After the fourth line the orientation changes to give a steeper set of diagonal lines. These lines also look to have been drawn top right to bottom left. They have been disrupted by the crack running through the piece. Some striations to the edge may suggest an attempt to smooth/grind the piece and shape it. To the base of these long steep diagonals are shorter associated lines. To the left is a 'v' shaped

arrangement with lines drawn from top to bottom and a single line to the right also drawn from top to bottom. A horizontal line features below this and looks to have been drawn from left to right. The perforation was likely produced with the rotations of stone tool.

Notched edge: the notched edge similarly has striations running down its length and this may be from an attempt to smooth or shape the piece. Alternately, this may be the natural surface and the obverse/reverse have been smoothed. They do not look to be bedding planes. The notches are deep and run across the short dimension of the piece. The cross section is variable with those to the bottom more clearly 'v' shaped and those to the top more 'u' shaped. They were likely all made with a sawing motion and hard pressure. The side of working may not have been the same in all cases.

Obverse: the perforation looks to have been made in much the same way with the rotation of a stone tool. The curving line running vertically down the length of the piece looks to cut through the perforation, suggesting the engraving was later than the perforation. A further curving line running diagonally looks to have been drawn from right to left (top to bottom) and this looks to cut the first lines suggesting it was drawn after. An arrangement of lines have then been drawn horizontally at shallow diagonals and converging. These lines were likely drawn from the centre towards the edge where they converge. Together they form a shallow and irregular 'v'. Below this two lines run diagonally across the piece. It is probable that the lines were worked from left top to right bottom. It is probable that the longer of the two lines was drawn first and that the lines were disrupted by the break. Two lines are present below this and are also curving. The lines have likely been drawn from right to top left, slightly difficult to be sure as the lines curve over onto the edge. No other designs can be identified on this surface and a design does not become apparent across these lines.

Plaque no. 709

No. 709 is much the same as No. 708 and looks to be a well rounded river pebble. The piece is broken and it would have no doubt been longer, perhaps giving a similar shape as No. 709. Decoration is present to both the obverse and reverse and notching is present to one edge, as in No. 708. The decoration on this piece is more sparse and a crack runs longitudinally down the piece to the obverse. The major detail seems to run across both the obverse and over onto the notched edge. It composes a long, deep, curving line running almost the length of the piece. To the obverse this line is met by a short line that runs 90

degrees to the long line, capping the start of the longer line. The shorter lines look to have been drawn from bottom to top. The longer line looks to have been drawn from bottom to top. There are no other obvious decorative features.

Notched edge: notching only present to one edge, as in No. 708. Similarly, they are relatively variable from notch to notch and they were likely produced with hard pressure and a sawing action.

Two additional lines are present towards the bottom of the obverse. A diagonal to the left of the crack running through the piece looks to have been drawn from top right to bottom left. A horizontal line cuts across the crack slightly above this line and looks to have been drawn from left to right.

Reverse: the reverse is sparsely occupied. The crack evident to the obverse continues over onto the reverse, running diagonally up through the centre of the piece. A line is present contacting the top edge and running diagonally towards the right edge. Two lines run from the grooves to the edge and fan out across the reverse. Cutting across the vertical line running from the top of the piece. The vertical line was likely drawn from bottom to top and the horizontal lines look to cut this line, suggesting they were later. The curving horizontals were likely drawn from right to left and are very fine. The crack running diagonally may actually be decorative, joining to a notch on the notched edge. This likely runs from right (notch) to left. The notches generally look less deep than those seen in No. 709. There are no other discernable designs to the reverse surface. Those lines that can be seen don't seem to form any obvious design.

Plaquette no. 710

Small piece of calcite that looks to have been cut at both ends. The colour is white/translucent with orange patches that look to be sediment caught within voids across the surface. The top and bottom ends have been cut and there are chop marks to both ends that confirm this piece has been anthropogenically modified. These modifications accentuate the shape to give a possible schematic human figure of the Gönnersdorf type. The fill within voids is a mix between orange clay based sediment and dark brown sediment. There is no obvious decoration across the piece to any side. There are many voids and cracks running through the raw material which all look to be natural properties of

the raw material. One side looks smoother than the other which perhaps suggests some modification perhaps to enhance the shape. A thin band may have been ground between the front of the 'legs' and the 'buttocks' to the smoother side. The 'buttocks' may have been subject to some natural fragmentation along cracks/bedding planes in the raw material, likely natural. The bottom of the piece looks to have been cut twice. A long flat cut gives the underside of the 'buttocks' and back of the legs, the shorter cut gives the bottom of the legs. Only the rougher side yields no traces of working and gives the most accurate, schematic, human form. There is no obvious modification to the thin edges. The piece looks minimally modified to exploit the natural, suggestive shape. There may be a cut mark to the 'buttocks' of the rougher surface. Again, orange sediment seems to fill voids across the surface. There may be some rubbing to the front edge, perhaps to subtly enhance the shape. The material filling voids does not appear to be red ochre. They are largely crusts of orange clay based sediments. This is confirmed at higher magnification.

Appendix 13. Plaquette 3D model still images

Appendix 13. Plaquette 3D model still images

Appendix 13 is a series of 3D model stills, each depicting a specific series of lines and informing the discussion of their relationship, as outlined in appendix 12. The full 3D models are presented in appendix 7. The appendix is presented digitally and the 3D model stills for eh plaquette are presented in a folder, with the name of the folder corresponding to the name of the plaquette, according to its palart number. This is the same number for the plaquette that is used throughout the PhD. Each still image is labeled with a letter and a number. The letter refers to the zone of the appendix in question, linked to a corresponding letter in appendix 12 where the lines are discussed. The number refers to images within a zone, and is reserved for cases where multiple image stills have been taken of the same zone. A base image of each plaquette is also presented in each case. The images stills were taken in MeshLab as a screen grab. Some images have been manipulated prior to capture using tools within MeshLab to add a filter to the model to enhance the surface and provide greater contrast between engraved lines and the broader surface. A sample of the plaquettes has a folder marked 'inked'. Here the 3D model still has been drawn over using a drawing tablet, stylus and GIMP software to add colour over the engraves lines, providing a clearer sense of the engraved form in each case.

Bibliography

Abi-Rached, L., Jobin, M. J., Kulkarni, S., McWhinnie, A., Dalva, K., Gragert, L., Babrzadeh, F., Gharizadeh, B., Luo, M., Plummer, F. A., Kimani, J., Carrington, M., Middleton, D., Rajalingam, R., Beksac, M., Marsh, S. G. E., Maiers, M., Guethlein, L. A., Tavoularis, S., Little, A.-M., Green, R. E., Norman, P. J., Parham, P. (2011) 'The Shaping of Modern Human Immune Systems by Multiregional Admixture with Archaic Humans' in *Science*, Vol. 334, pp. 89-94.

Abrahamian, L. H. (1987) 'Comment' in *Current Anthropology*, Vol. 28, No. 1, pp. 71.

Abramova, Z. A., Page, C. and Chard, C. S. (1967) 'Paleolithic Art in the U.S.S.R.' in *Arctic Anthropology*, Vol. 4, No. 2, pp. 1-179.

Absolon, K. (1949) 'The Diluvial Anthropomorphic Statuettes and Drawings, Especially the So-Called Venus Statuettes, Discovered in Moravia: A Contemporary Study' in *Artibus Asiae*, Vol. 12, No. 3, pp. 201-220.

Absolon, K. (1949) 'Moravia in Palaeolithic Times' in *American Journal of Archaeology*, Vol. 53, No. 1 pp. 19-28.

Adán, G. E., Álvarez-Lao, D., Turrero, P., Arbizu, M., Garía-Vázquez, E. (2009) 'Fish diet resources in North Spain during the Upper Palaeolithic' in *Journal of Archaeological Science*, Vol. 36, pp. 895-899.

Adhikary, A. K. (2006) 'The birhor' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 248-251. Cambridge: Cambridge University Press.

Adler, D. S. (2009) 'The earliest musical tradition' in *Nature*, Vol. 460, pp. 695-696.

Aiello, L. C. and Dunbar, R. I. M. (1993) 'Neocortex Size, Group Size, and the Evolution of Language' in *Current Anthropology*, Vol. 34, No. 2, pp. 184-193.

Alberghina, D., Caudullo, E., Chan, W. Y., Bandi, N., Panzera, M. (2016) 'Acoustic characteristics of courtship and agonistic vocalizations in Przewalskii's wild horse and in domestic horse' in *Applied Animal Behaviour Science*, Vol. 174, pp. 70-75.

Alekseenko, E. A. (2006) 'The Ket (Ostyak) of the upper and middle Enisei River' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 156-160. Cambridge: Cambridge University Press.

- Alpert, B. O. (2012) 'La grotte de niaux, theatre des illusions' in *L'Anthropologie*, Vol. 116, pp. 680-693.
- Alsadik, B., Gerke, M. and Vosselman, G. (2015) 'Efficient Use of Video for 3D Modelling of Cultural Heritage Objects' in *ISPRS Annals of Photogrammetry, Remote Sensing and Spatial Information Science*, Vol. II-3/W4, 1-8, doi:10.5194/isprsannals-II-3-W4-1-2015.
- Alt, K. W., Pichler, S., Vach, W., Klíma, B., Vlček, E. and Sedlmeier, J. (1997) 'Twenty-Five Thousand-Year-Old Triple Burial from Dolni Věstonice: An Ice Age Family?' in *American Journal of Physical Anthropology*, Vol. 102, pp. 123-131.
- Alvarez, M., Fiore, D., Favret, E. and Castillo Guerra, R. (2001) 'The Use of Lithic Artefacts for Making Rock Art Engravings: Observation and Analysis of Use-Wear Traces in Experimental Tools Through Optical Microscopy and SEM' in *Journal of Archaeological Science*, Vol. 28, 457-464.
- Álvarez-Fernández, E., Carriol, R.-P., Jordá, J. F., Aura, J. E., Avezuela, B., Badal, E., Carrión, Y., García-Guinea, J., Maestro, A., Morales, J. V., Perez, G., Perez-Ripoll, M., Rodrigo, M. J., Scarff, J. E., Villalba, M. P. and Wood, R. (2014) 'Occurrence of whale barnacle in Nerja Cave (Málaga, southern Spain): Indirect evidence of whale consumption by humans in the Upper Magdalenian' in *Quaternary International*, Vol. 337, pp. 163-169.
- Anderson, D. G. (2006) 'The Evenki of the lower Enisei Valley' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 142-246. Cambridge: Cambridge University Press.
- Angulo, L. C., Garcia-Diez, M. (2009) 'Male Genital Representation in Paleolithic Art: Erection and Circumcision Before History' in *Journal of Urology*, Vol. 74, No. 1, pp. 10-14.
- Angulo, J. C., García-Díez, M. and Martínez, M. (2011) 'Phallic Decoration in Palaeolithic Art: Genital Scarification, Piercing and Tattoos' in *The Journal of Urology*, Vol. 186, No. 6, pp. 2498-2503.
- Andersen, S. H. (1985) 'Tybrind Vig: A Preliminary Report on Submerged Ertebølle Settlement on the West coast of Fyn' in *Journal of Danish Archaeology*, Vol. 4, pp. 52-69.
- Apicella, C. L., Marlowe, F. W., Fowler, J. H. and Christakis, N. A. (2012) 'Social networks and cooperation in hunter-gatherers' in *Nature*, Vol. 481, pp. 497-501.

- Arcand, B. (2006) 'The Cuiva' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 97-100. Cambridge: Cambridge University Press.
- Argent, G. (2010) 'Do the Clothes Make the Horse? Relationality, Roles and Statuses in Iron Age Inner Asia' in *World Archaeology*, Vol. 42, No. 2, pp. 157-174.
- Argent, G. (2013) 'Inked: Human-Horse Apprenticeship, Tattoos, and Time in the Pazyryk World' in *Society and Animals*, Vol. 21, pp. 178-193.
- Asch, M. and Smith, S. (2006) 'Slavey Dene' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, Pg. 46-50. Cambridge: Cambridge University Press.
- Attaelmanan, A. G., Yousif, E. A. (2012) 'EDXRF analysis of pigment used for the decoration of Mleiha pottery' in *Journal of Archaeological Science*, Vol. 39, pp. 2231-2237.
- Aubert, M., Brumm, A., Ramli, M., Sutikana, T., Saptomo, E. W., Hakim, B., Morwood, M. J., van den Bergh, G. D., Kinsley, L., and Doretto, A. (2014) 'Pleistocene cave art from Sulawesi, Indonesia' in *Nature*, Vol. 514, pp. 223-227.
- Aubry, T., Bradley, B., Almeida, B., Walter, B., Neves, M. J., Pelegrin, J., Lenoir, M. and Tiffagom, M. (2008) 'Solutrean laurel leaf production at Maîtreaux: an experimental approach guided by techno-economic analysis' in *World Archaeology*, Vol. 40, No. 1, pp. 48-66.
- Aubry, T. Dimuccio, L. A., Bergadá, M. M., Sampaio, J. D., Sellami, F. (2010) 'Palaeolithic engravings and sedimentary environments in the Côa River Valley (Portugal): Implications for the detection, interpretation and dating of open-air rock art sites' in *Journal of Archaeological Science*, Vol. 37, pp. 3306-3319.
- Audouze, F. (2010) 'Domesticity and Spatial Organization at Verberie' in E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pg. 145-175. USA: State University of New York Press.
- Azéma, M. and Rivière, F. (2012) 'Animation in Palaeolithic art: a pre-echo of cinema' in *Antiquity*, Vol. 86, No. 332, pp. 316-324.
- Bachechi, L., Fabbri, P-F. and Mallegni, F. (1997) 'An Arrow-Caused Lesion in a Late Upper Palaeolithic Human Pelvis' in *Current Anthropology*, Vol. 38, No. 1, pp. 135-140.

- Bahn, P. G. (1982) 'Inter-site and inter-regional links during the Upper Palaeolithic: The Pyrenean Evidence' in *Oxford journal of Archaeology*, Vol. 1, No. 3, pp. 247-268.
- Bahn, P. G. (1988) 'comment' in *Current Anthropology*, Vol. 29, No. 2, pp. 217-218.
- Bahn, P. G. (1992) 'Expecting the Spanish Inquisition: Altamira's Rejection in its 19th Century Context' in *Ancient Images, Ancient Thought: 23rd Annual Chacmool Conference*, pp. 339-346. Canada: University of Calgary Archaeology of Ideology Association.
- Bahn, P. (1995) 'Cave art without caves' in *Antiquity*, Vol. 69, No. 263, pp. 231-237.
- Bahn, P. (2014) 'Religion and Ritual in the Upper Palaeolithic' in V. Cummings, P. Jordan and M. Zvelebil (Eds.) *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*, DOI 10.1093/oxfordhb/9780199232444.013.0023
- Bahn, P. and Pettitt, P. (2009) *Britain's Oldest Art: The Ice Age cave art of Creswell Crags*. UK: English Heritage.
- Bahn, P. G. and Vertut, J. (1988) *Images of the Ice Age*. Italy: Windward.
- Bahuchet, S. (2006) 'Aka Pygmies' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 190-194. Cambridge: Cambridge University Press.
- Bailey, G. (1987) 'Breaking the Time Barrier' in *Archaeological Review from Cambridge*, Vol. 6, No. 1, pp. 5-20.
- Balée, W. (2006) 'The Sirionó of the llanos de Mojos, Bolivia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 105-109. Cambridge: Cambridge University Press.
- Balme, J. and Morse, K. (2006) 'Shell beads and social behaviour in Pleistocene Australia' in *Antiquity*, Vol. 80, No. 310, pp. 799-811.
- Bamford, S. (1998) 'To eat for another: taboo and the elicitation of bodily form among the Kamea of Papua New Guinea' in M. Lambek and L. Strathern (Eds.) *Bodies and Persons: Comparative Perspectives from Africa and Melanesia*, pg. 158-171. Cambridge: Cambridge University Press.
- Banks, W. E., d'Errico, F., Townsend Peterson, A., Kageyama, M. and Colombeau, G. (2008) 'Reconstructing ecological niches and geographic distributions of caribou (*Rangifer*

tarandus) and red deer (*Cervus elaphus*) during the Last Glacial Maximum' in *Quaternary Science Reviews*, Vol. 27, pp. 2568-2575.

Barber, I. G., Maxwell, J., Hemi, R. (2014) 'Growing images: 3D digital models to investigate archaeological Moriori carvings in living trees' in *World Archaeology*, Vol. 46, No. 1, pp. 63-77.

Bardelli, F., Barone, G., Crupi, V., Longo, F., Majolino, D., Mazzoleni, P. and Venuti, V. (2011) 'Combined non-destructive XRF and SR-XAS study of archaeological artefacts' in *Analytical and Bioanalytical Chemistry*, Vol. 399, pp. 3147-3153.

Barnard, A. (2004a) 'Hunter-Gatherers in History, Archaeology and Anthropology: Introductory Essay' in A. Barnard (Ed.) *Hunter-Gatherers History, Archaeology and Anthropology*, pp. 1-14. Oxford: Berg.

Barnard, A. R. (2004b) 'Hunting-and-gathering society: an eighteenth-century Scottish invention' in A. Barnard (Ed.) *Hunter-Gatherers in History, Archaeology and Anthropology*, pp. 31-42. Oxford: Berg.

Barnard, A. (2014) 'Defining Hunter Gatherers: Enlightenment, Romantic, and Social Evolutionary Perspectives' in V. Cummings, P. Jordan and M. Zvelebil (Eds.) *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*, DOI: 10.1093/oxfordhb/9780199551224.013.011

Barton, M. C., Clark, G. A., Cohen, A. E. (1994) 'Art as Information: Explaining Upper Palaeolithic Art in Western Europe' in *World Archaeology*, Vol. 26, No. 2, pp. 185-207.

Battaglia, D. (1983) 'Projecting Personhood in Melanesia: The Dialectics of Artefact Symbolism on Sabarl Island' in *Man*, New Series, Vol. 18, No. 2, pp. 289-304.

Battaglia, D. (1995) *The Rhetorics of Self-Making*. Berkeley: University of California Press.

Battaglia, D. (1995) 'Problematizing the Self: A Thematic Introduction' in D. Battaglia (Ed.) *The Rhetorics of Self-Making*, pg. 1-15. Berkeley: University of California Press.

Baxter, J. E. (2008) 'The Archaeology of Childhood' in *Annual Review of Anthropology*, Vol. 37, pp. 159-175.

- Beckett, J. (2006) 'Torres Strait Islanders' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 358-362. Cambridge: Cambridge University Press.
- Bednarik, R. G. (1994) 'A taphonomy of palaeoart' in *Antiquity*, Vol. 68, No. 258, pp. 68-74.
- Bednarik, R. G. (1995) 'The Côa petroglyphs: an obituary to the stylistic dating of Palaeolithic rock-art' in *Antiquity*, Vol. 69, No. 266, pp. 877-883.
- Bednarik, R. G. (1998) 'The 'Australopithecine' Cobble from Makapansgat, South Africa' in *The South African Archaeological Bulletin*, Vol. 53, No. 167, pp. 4-8.
- Bednarik, R. G. (2003) 'A Figurine from the African Acheulian' in *Current Anthropology*, Vol. 44, No. 3, pp. 405-413.
- Bednarik, R. G. (2008a) 'Children as Pleistocene artists' in *Rock Art Research*, Vol. 25, pp. 173-182.
- Bednarik, R. G. (2010) 'Conclusions in response to minimum cues' in *Rock Art Research*, Vol. 27, No. 1, pp. 80-82.
- Bednarik, R. G. (2013) 'Brain Disorders and Rock Art' in *Cambridge Archaeological Journal*, Vol. 23, No. 1, pp. 69-81.
- Bednarik, R. G. (2016) 'Rock Art and Pareidolia' in *Rock Art Research*, Vol. 33, No. 2, pp. 167-181.
- Bégouën, R. and Clottes, J. (1991) 'Portable and Wall Art in the Volp Caves, Montesquieu-Avantès (Ariège)' in *Proceedings of the Prehistoric Society*, Vol. 57, pp. 65-79.
- Bello, S. M., Delbarre, G., Parfitt, S. A., Carrant, A. P., Kruszynski, R. and Stringer, C. B. (2013) 'Lost and found: the remarkable curatorial history of one of the earliest discoveries of Palaeolithic portable art' in *Antiquity*, Vol. 87, No. 335, pp. 237-244.
- Bello, S. M., De Groote, I. and Delbarre, G. (2013) 'Application of 3-dimensional microscopy and micro-CT scanning to the analysis of Magdalenian portable art on bone and antler' in *Journal of Archaeological Science*, Vol. 40, pp. 2464-2476.
- Bello, S. M., Parfitt, S. A. and Stringer, C. B. (2011) 'Earliest Directly-Dated Human Skull-Cups' in *PLoS ONE*, Vol. 6, No. 2, e17026.

Bello, S. M., Saladié, P., Cáceres, I., Rodríguez-Hidalgo, A. and Parfitt, S. A. (2015) 'Upper Palaeolithic ritualistic cannibalism at Gough's Cave (Somerset, UK): The human remains from head to toe' in *Journal of Human Evolution*, Vol. 82, pp. 170-189.

Bétirac, B. (1952) 'L'Abri Montastruc á Bruniquel (Tarn-et-Garonne)' in *L'Anthropologie*, Tome 56, pp. 213-231.

Beyries, S. and Cattin, M.-I. (2015) 'Resharpener and recycling: Different conceptions of the Magdalenian tools' in *Quaternary International*, Vol. 361, pp. 260-268.

Bicho, N. and Haws, J. (2012) 'The Magdalenian in central and southern Portugal: Human ecology at the end of the Pleistocene' in *Quaternary International*, Vol. 272-273, pp. 6-16.

Bicket, A. and Tizzard, L. (2015) 'A review of the submerged prehistory and palaeolandscapes of the British Isles' in *Proceedings of the Geologists' Association*, Vol. 126, pp. 643-663.

Biesele, M. and Royal-oo, K. (2006) 'The Ju/'hoansi of Botswana and Namibia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 205-209. Cambridge: Cambridge University Press.

Bird-David, N. (1990) 'The Giving Environment: Another Perspective on the Economic System of Gatherer-Hunters' in *Current Anthropology*, Vol. 31, No. 2, pp. 189-196.

Bird-David, N. (2006) 'The Nayaka of the Wynaad, South India' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 257-260, Cambridge: Cambridge University Press.

Bird David, N. (2006) 'Animistic Epistemology: Why do some Hunter-Gatherers not Depict Animals?' in *Ethnos*, Vol. 71, No. 1, pp. 33-50.

Birouste, C., Chauvière, F.-X., Plassard, F. and Dachary, M. (2015) 'The horse mandibles at Duruthy rockshelter (Sorde-l'Abbaye, Landes, France) and the identification of ontological systems in the Pyrenean Magdalenian' in *Quaternary International*, DOI 10.1016/j.quaint.2015.12.002

Black, L. T. (1987) 'Comment' in *Current Anthropology*, Vol. 28, No. 1, pp. 73-75.

- Blackley, P. G., Buck, C. E. (2003) 'The Late Glacial human reoccupation of north-western Europe: new approaches to space-time modelling' in *Antiquity*, Vol. 77, No. 296, pp. 232-240.
- Blockley, S. P. E., Donahue, R. E. and Pollard, M. (2000) 'Radiocarbon calibration and Late Glacial occupation in northwest Europe' in *Antiquity*, Vol. 74, No. 283, pp. 112-119.
- Blockley, S. P. E., Blockley, S. M., Donahue, R. E., Lane, C. S., Lowe, J. J., Pollard, A. M. (2006) 'The chronology of abrupt climate change and Late Upper Palaeolithic human adaptation in Europe' in *Journal of Quaternary Science*, Vol. 21, No. 5, pp. 575-584.
- Bocherens, H., Drucker, D. G., Bonjean, D., Bridault, A., Conard, N. J., Cupillard, C., Germonpré, M., Höneisen, M., Münzel, S. C., Napierala, H., Patou-Mathis, M., Stephan, E., Uerpmann, H.-P. and Ziegler, R. (2011) 'Isotopic evidence for dietary ecology of cave lion (*Panthera spelaeon*) in North-Western Europe: Prey choice, competition and implications for extinction' in *Quaternary International*, Vol. 245, pp. 249-261.
- Bocquet-Appel, J.-P. (2000) 'Population Kinetics in the Upper Palaeolithic in Western Europe' in *Journal of Archaeological Science*, Vol. 27, pp. 551-570.
- Bocquet-Appel, J.-P., Demars, P.-Y., Noiret, L. and Dobrowsky, D. (2005) 'Estimates of Upper Palaeolithic meta-population size in Europe from archaeological data' in *Journal of Archaeological Science*, Vol. 32, pp. 1656-1668.
- Boëda, E., Bonilauri, S., Connan, J., Jarvie, D., Mercier, N., Tobey, M., Valladas, H., al Sakhel, H., Muhesen, S. (2008) 'Middle Palaeolithic bitumen use at Umm el Tlel around 70,000 BP' in *Antiquity*, Vol. 82, No. 318, pp. 853-861.
- Boehm, C. (1993) 'Egalitarian Behaviour and Reverse Dominance Hierarchy [and Comments and Reply]' in *Current Anthropology*, Vol. 34, No. 3, pp. 227-254.
- Boehm, C. (2004) *Hierarchy in the Forest: The Evolution of Egalitarian Behaviour*. Cambridge: Harvard University Press.
- Boehm, C. (2011) 'Retaliatory Violence in Human Prehistory' in *British Journal of Criminology*, Vol. 51, No. 3, pp. 518-534.
- Boesch, C. (2003) 'Is Culture a Golden Barrier Between Human and Chimpanzee?' in *Evolutionary Anthropology*, Vol. 12, pp. 82-91.

Boesch, C. and Boesch, H. (1990) 'Tool Use and Tool making in Wild Chimpanzees' in *Folia Primatologica*, Vol. 54, pp. 86-99.

Boesch, C., Bolé, C., Eckhardt, N. and Boesch, H. (2010) 'Altruism in Forest Chimpanzees: The Case of Adoption' in *PLoS ONE*, Vol. 5, No. 1, e8901.

Boesch, C., Tomasello, M., Byrne, R. W., Galef Jr., B. G., Ingold, T., McGrew, W. C., Paterson, J. D., Whiten, A. (1998) 'Chimpanzee and Human Cultures [and Comments and Reply]' in *Current Anthropology*, Vol. 39, No. 5, pp. 591-614.

Boivin, N. (2005) 'Comments on A. Jones, 'Archaeometry and Materiality: Materials-Based Analysis in Theory and Practice'', *Archaeometry*, 46(3), 327-338, 2004, and Reply. Comments I: Post-Textual Archaeology and Archaeological Science' in *Archaeometry*, Vol. 47, No. 1, pp. 175-179.

Borić, D. (2007) 'Images of Animality: Hybrid Bodies and Mimesis in Early Prehistoric Art' in C. Renfrew and I. Morley (Eds.) *Image and Imagination: a global prehistory of figurative representation*, pg. 83-100. Cambridge: McDonald Institute for Archaeological Research.

Bosinski, G. (1991) 'The Representation of Female Figures in the Rhineland Magdalenian' in *Proceedings of the Prehistoric Society*, Vol. 57, pp. 51-64.

Boucher de Perthes (1847) *Antiquités Celtiques et Antédiluviennes. Mémoire sur l'Industrie primitive*. Paris: Victor Didron.

Boudadi- Maligne, M. and Escarguel, G. (2014) 'A biometric re-evaluation of recent claims for Early Upper Palaeolithic wolf domestication in Eurasia' in *Journal of Archaeological Science*, Vol. 45, pp. 80-89.

Bourdier, C. (2013) 'Rock art and social geography in the Upper Paleolithic. Contribution to the socio-cultural function of the Roc-aux-Sorciers rock-shelter (Angles-sur-l'Anglin, France) from the viewpoint of its sculpted frieze' in *Journal of Anthropological Archaeology*, Vol. 32, pp. 368-382.

Bouzouggar, A., Barton, N., Vanhaeren, M., d'Errico, F., Collcutt, S., Higham, T., Hodge, E., Parfitt, S., Rhodes, E., Schwenninger, J.-L., Stringer, C., Turner, E., Ward, S., Moutmir, A. and Stambouli, A. (2007) '82,000-year-old shell beads from North Africa and implications for the origins of modern human behaviour' in *Proceedings of the National Academy of Sciences*, Vol. 104, No. 24, pp. 9964-9969.

- Boyd, L. E. (1988) 'Time Budgets of Adult Przewalski Horses: Effects of Sex, Reproductive Status and Enclosure' in *Applied Animal Behaviour Science*, Vol. 21, pp. 19-39.
- Boyd, L. E. (1991) 'The behaviour of Przewalski's horse and its importance in their management' in *Applied Animal Behaviour Science*, Vol. 29, pp. 301-318.
- Boyd, L. E., Carbonaro, D. A., Houpt, K. A. (1988) 'The 24-Hour Time Budget of Przewalski Horses' in *Applied Animal Behaviour Science*, Vol. 21, pp. 5-17.
- Boyette, A. H. (2016) 'Children's Play and Culture Learning in an Egalitarian Foraging Society' in *Child Development*, Vol. 87, No. 3, pp. 759-769.
- Bray, P. J. and Pollard, A. M. (2005) 'Comments on A. Jones, 'Archaeometry and Materiality: Materials-Based Analysis in Theory and Practice', *Archaeometry*, 46(3), 327-338, 2004, and Reply. Comments II: The Underpinnings and Consequences of the Materiality Approach' in *Archaeometry*, Vol. 47, No. 1, pp. 179-182.
- Breuil, A. H. (1979) [1952] *Four Hundred Centuries of Cave Art*. New York: Hacker Art Books.
- Brightman, R. A. (2002) *Grateful Prey: Rock Cree Human-Animal Relationships*. USA: University of Regina Press.
- Brittain, M. and Overton, N. (2013) 'The Significance of Others: A Prehistory of Rhythm and Interspecies Participation' in *Society and Animals*, Vol. 21, pp. 135-150.
- Brody, H. (2001) *The Other Side of Eden: Hunters, Farmers and the Shaping of the World*. USA: Douglas and McIntyre.
- Brosius, J. P. (2006) 'The western Penan of Borneo' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 312-316. Cambridge: Cambridge University Press.
- Brück, J. (2001) 'Monuments, Power and Personhood in the British Neolithic' in *The Journal of the Royal Anthropological Institute*, Vol. 7, No. 4, pp. 649-667.
- Brück, J. (2004a) 'Material metaphors: the relational construction of identity in Early Bronze Age burials in Britain and Ireland' in *Journal of Social Archaeology*, Vol. 4, pp. 307-333.
- Brück, J. (2004b) 'Homing Instincts: Grounded Identities and Dividual Selves in the British Bronze Age' in C. E. Casella and C. Fowler (Eds.) *The Archaeology of Plural and Changing Identities*, pg. 135-160. USA: Springer.

Brück, J. (2006) 'Fragmentation, Personhood and the Societal Construction of Technology in Middle and Late Bronze Age Britain' in *Cambridge Archaeological Journal*, Vol. 16, No. 3, pp. 297-315.

Bruno, F., Bruno, S., De Sensi, G., Luchi, M.-L., Mancuso, S. and Muzzupappa, M. (2010) 'From 3D reconstruction to virtual reality: A complete methodology for digital archaeological exhibition' in *Journal of Cultural Heritage*, Vol. 11, pp. 42-49.

Burch Jr., E. S. (1972) 'The Caribou/Wild Reindeer as a Human Resource' in *American Antiquity*, Vol. 37, No. 3, pp. 339-368.

Burch, Jr., E. S. and Csonka, Y. (2006) 'The Caribou Inuit' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 56-60. Cambridge: Cambridge University Press.

Burdukiewicz, J. M. (2014) 'The origin of symbolic behaviour of Middle Palaeolithic humans: Recent controversies' in *Quaternary International*, Vol. 326-327, pp. 398-405.

Burke, A. (2008) 'Group-Based Versus Individual-Based Approaches: Selecting an Appropriate Scale for the Archaeological Study of Prehistoric Hunting and Gathering People' in D. Papagianni, R. Layton and H. Machner (Eds.) *Time and Change: Archaeological and Anthropological Perspectives on the Long-Term in Hunter-Gatherer Societies*, pp. 135-142. Oxford: Oxbow Books.

Busby, C. (1997) 'Permeable and Partible Persons: A Comparative Analysis of Gender and Body in South India and Melanesia' in *Journal of the Royal Anthropological Institute*, Vol. 3, pp. 261-278.

Canti, M. and Linford, N. (2000) 'The Effects of Fire on Archaeological Soils and Sediments: Temperature and Colour Relationships' in *Proceedings of the Prehistoric Society*, Vol. 66, pp. 385-395.

Cantor, G. (2015) 'Emotional Reactions to the Great Exhibition of 1851' in *Journal of Victorian Culture*, Vol. 20, No. 2, pp. 230-245.

Casella, E. C. and Fowler, C. (2004) *The Archaeology of Plural and Changing Identities*. USA: Springer.

Casella, E. C. and Fowler C. (2004) 'Beyond Identification: An Introduction' in E. C. Casella and C. Fowler *The Archaeology of Plural and Changing Identities*, pp. 1-8. USA: Springer.

- Cattin, M.-I. (2010) 'Comparing Social Organizations of Magdalenian Hunter-Gatherers: A Swiss Example' in E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pp. 213-225. USA: State University of New York Press.
- Centeno, S. A., Williams, V. I., Little, N. C. and Speakman, R. J. (2012) 'Characterization of surface decorations in Prehispanic archaeological ceramics by Raman spectroscopy, FTIR, XRD, and XRF' in *Vibrational Spectroscopy*, Vol. 58, pp. 119-124.
- Chapman, J. (2000) *Fragmentation in Archaeology: people, places and broken objects in the prehistory of South-Eastern Europe*. London: Routledge.
- Chapman, J. and Gaydarska, B. (2007) *Parts and Wholes: Fragmentation in Prehistoric Context*. Oxford: Oxbow Books.
- Chapman, J. and Gaydarska, B. (2009) 'Fragmenting Hominins and the Presencing of Early Palaeolithic Social Worlds' in *Proceedings of the British Academy*, Vol. 158, pp. 417-452.
- Christy, H. (1865) 'On the Prehistoric Cave-Dwellers of Southern France' in *Transactions of the Ethnological Society of London*, Vol. 3, pp. 362-372.
- Churchill, S. E. and Formicola, V. (1997) 'A Case of Marked Bilateral Asymmetry in the Upper Limbs of an Upper Palaeolithic Male from Barma Grande (Iiguria), Italy' in *International Journal of Osteoarchaeology*, Vol. 7, pp. 18-38.
- Clark, A. (1998a) *Being There: Putting Brain, Body and World Together Again*. USA: MIT Press.
- Clark, A. (1998b) 'Time and Mind' in *The Journal of Philosophy*, Vol. 95, No. 7, pp. 354-376.
- Clark, A. (1999a) 'Where brain, body and world collide' in *Journal of Cognitive Systems Research*, Vol. 1, pp. 5-17.
- Clark, A. (1999b) 'An embodied cognitive science?' in *Trends in Cognitive Sciences*, Vol. 3, No. 9, pp. 345-351.
- Clark, A. (2002) 'Minds, Brains and Tools' in H. Clapin (Ed.) *Philosophy of Mental Representation*, pp. 66-90. Oxford: Clarendon Press.
- Clark, A. (2003) *Natural Born Cyborgs: Minds, Technologies, and the Future of Intelligence*. UK: Oxford University Press.

Clark, A. (2008) *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*. UK: Oxford University Press.

Clark, A. and Chalmers, D. (1998) 'The Extended Mind' in *Analysis*, Vol. 58, No. 1, pp. 7-19.

Clark, G. A., Barton, C. M. and Cohen, A (1996) 'Explaining Art in the Franco-Cantabrian Refugium: An Information Exchange Model' in D. A. Meyer, P. C. Dawson and D. T. Hanna (Eds.) *Debating Complexity: Proceedings of the 26th Annual Chacmool Conference*, pg. 241-253. Canada: The Archaeological Association of the University of Calgary.

Clogg, P. and Díaz-Andreu, M. (2000) 'Digital Image Processing and the Recording of Rock Art' in *Journal of Archaeological Science*, Vol. 27, pp. 837-843.

Clottes, J. (2004) 'Hallucinations in Caves' in *Cambridge Archaeological Journal*, Vol. 14, No. 1, pp. 81-82.

Clottes, J. (2005) 'What Did Ice Age people do in the Deep Caves?' in *Expedition*, Vol. 47, No. 3, pp. 20-24.

Clottes, J. (2013) 'Why Did They Draw in Those Caves?' in *Time and Mind: The Journal of Archaeology, Consciousness and Culture*, Vol. 6, No. 1, pp. 7-14.

Clottes, J. (2016) *What is Palaeolithic Art? Cave Paintings and the Dawn of Human Creativity*. Chicago: University of Chicago Press.

Cohen, C. (2014) 'Jacques Boucher de Perthes 1788-1868 humanity's high antiquity' in B. Fagan (Ed.) *The Great Archaeologists*, pg. 25-27. United Kingdom: Thames and Hudson.

Coles, B. J. (1998) 'Doggerland: a Speculative Survey' in *Proceedings of the Prehistoric Society*, Vol. 64, pp. 45-81.

Conard, N. J. (1994) 'On the Prospects for an Ethnography of Extinct Hominids' in *Current Anthropology*, Vol. 35, No. 3, pp. 281-282.

Conard, N. J. (2005) 'Aurignacian Art in Swabia and the Beginnings of European Figurative Representations in Europe' in A. Broglio, and G. Dalmeri (Eds.) *Pitture Paleolitiche Nelle Prealpi Venete: Grotte di Fumane e Riparo Dalmeri. Memorie del Museo Civico di Storia Naturale di Verona, Series 2. Sezione Scienze dell'Uomo*, Vol. 9, pp. 82-88. Verona: Museo Civico di Storia Naturale di Verona.

- Conard, N. J. (2009) 'A female figurine from the basal Aurignacian of Hohle Fels Cave in southwestern Germany' in *Nature*, Vol. 459, pp. 248-252.
- Conard, N. J., Malina, M. and Münzel, S. C. (2009) 'New flutes document the earliest musical tradition in southwest Germany' in *Nature*, Vol. 460, pp. 737-740.
- Conkey, M. W. (1980) 'The Identification of Prehistoric Hunter-Gatherer Aggregation Sites: The Case of Altamira' in *Current Anthropology*, Vol. 21, No. 5, pp. 609-630.
- Conkey, M. W. (1987) 'New Approaches in the Search for Meaning? A Review of Research in "Paleolithic Art"' in *Journal of Field Archaeology*, Vol. 14, pp. 413-430.
- Conkey, M. W. (2010) 'Images Without Words: The Construction of Prehistoric Imaginaries for Definitions of 'Us'' in *Journal of Visual Culture*, Vol. 9, pp. 272-283.
- Conkey, M. (2014) 'André Leroi-Gourhan 1911-86 how humans make their worlds' in B. Fagan (Ed.) *The Great Archaeologists*, pp. 268-271. United Kingdom: Thames and Hudson.
- Conkey, M. and Tringham, R. E. (1995) 'Archaeology and the Goddess: Exploring the Contour of Feminist Archaeology' in D. C. Stanton and A. J. Stewart (Eds.) *Feminisms in the Academy*, pp. 199-248. USA: University of Michigan Press.
- Conneller, C. (2004) 'Becoming deer. Corporeal transformations at Star Carr' in *Archaeological Dialogues*, Vol. 11, No. 1, pp. 37-56.
- Conneller, C. (2011) *An Archaeology of Materials: Substantial Transformations in Early Prehistoric Europe*. London: Routledge.
- Consens, M (1988) 'Comment' in *Current Anthropology*, Vol. 29, No. 2, pp. 221-222.
- Cook, J. (2007a) 'James Hutton: Discoverer of Geological Time' in R. Huxley (Ed.) *The Great Naturalists*, pp. 186-189. UK: Thames and Hudson.
- Cook, J. (2007b) 'Charles Lyell: Advocate of Modern Geology' in R. Huxley (Ed.) *The Great Naturalists*, pp. 246-249. UK: Thames and Hudson.
- Cook, J. (2010) *The Swimming Reindeer: Object in Focus*. UK: British Museum Press.
- Cook, J. (2013) *Ice Age Art: Arrival of the Modern Mind*. UK: British Museum Press.
- Corbey, R. and Van Damme, W. (2015) 'Introduction: European encounters with 'primitive art' during the late nineteenth century' in *Journal of Art Historiography*, Vol. 12, pp. 1-10.

- Craig, O. E., Biazzo, M., Colonese, A. C., Di Giuseppe, Z., Martinez-Labraga, C., Lo Vetro, D., Lelli, R., Martini, F., Rickards, O. (2010) 'Stable isotope analysis of late Upper Palaeolithic human and faunal remains from Grotta del Romito (Cosenza), Italy' in *Journal of Archaeological Science*, Vol. 37, pp. 2504-2512.
- Cushman, P. (1990) 'Why the Self is Empty: Towards a Historically Situated Psychology' in *American Psychologist*, Vol. 45, No. 5, pp. 599-611.
- Cuvier, C. (1824) *Histoire Naturelle des Mammifères*. Paris: Muséum d'Histoire Naturelle.
- Daly, R. (2006) 'Witsuwit'en and Gitxsan of the Western Cordillera' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 71-75. Cambridge: Cambridge University Press.
- Damasio, A. (2000) *The Feeling of What Happens: Body, Emotion and the Making of Consciousness*. UK: Vintage.
- Damasio, A. (2006) *Descartes' Error*. UK: Vintage.
- Dams, L. (1985) 'Palaeolithic Lithophones: Descriptions and Comparisons' in *Oxford Journal of Archaeology*, Vol. 4, No. 1, pp. 31-46.
- Darwin, C. (1859) *On the Origin of Species and Descent by Natural Selection*. London: John Murray.
- David, B., Barker, B., Petchey, F., Delannoy, J.-J., Geneste, J.-M., Rowe, C., Eccleston, M., Lamb, L. and Whear, R. (2013) 'A 28,000 year old excavated painted rock from Nawarla Gabarnmang, norther Australia' in *Journal of Archaeological Science*, Vol. 40, pp. 2493-2501.
- David, B., Geneste, J.-M., Petchey, F., Delannoy, J.-J., Barker, B. and Eccleston, M. (2013) 'How old are Australia's pictographs? A review of rock art dating' in *Journal of Archeological Science*, Vol. 40, pp. 3-10.
- Davies, W. (2009) 'The Abbé Henri Breuil (1877-1961)' in R. Hosfield, F. Wenban-Smith and M. Pope (Eds.) *Great Prehistorians: 150 Years of Palaeolithic Research, 1859-2009 (Special Volume 30 of Lithics: The Journal of the Lithics Study Society)*, pp. 127-142. Lithic Studies Society: London.

Davies, R. and Underdown, S. (2006) 'The Neanderthals: a Social Synthesis' in *Cambridge Archaeological Journal*, Vol. 16, No. 2, pp. 145-164.

Davin, F., Karlin, C., D'Lachenko, V. (2010) 'Slaughter and Carcass Processing of Reindeer in Siberia: Patterns and Distribution of Tasks-Comparisons Between Prehistoric and Ethnological Cases' In E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pp. 245-268. USA: State University of New York Press.

Davis, W. (1987) 'Comment' in *Current Anthropology*, Vol. 28, No. 1, pp. 75-77.

Dayet, L., Texier, P.-J., Daneil, F. and Porraz, G. (2013) 'Ochre resources from the Middle Stone Age sequence of Diepkloof Rock Shelter, Western Cape, South Africa' in *Journal of Archaeological Science*, Vol. 40, pp. 3492-3505.

De Craemer, W. (1983) 'A Cross-Cultural Perspective on Personhood' in *The Milbank Memorial Fund Quarterly*, Vol. 61, No 1, pp. 19-34.

de Figueiredo, S. S., Nobre, L., Cristo Ropero, A., Xavier, P., Gaspar, R. and Carrondo, J. (2014) 'Reassembly Methodology in Palaeolithic Engraved Plaques from Foz Do Medal Terrace (Trás-os-Montes, Portugal)' in M. Á. Medina-Alcaide, A. J. Romero-Alonso, R. M. Ruiz-Márquez and J. L. Sanchidrián Torti (Eds.) *Sobres rocas y huesos: las sociedades prehistóricas y sus manifestaciones plásticas*, pp. 429-439. Córdoba: Universidad de Córdoba y Fundación Cueva de Nerja.

de Figueiredo, S. S., Xavier, P., Neves, D., Maciel, J., Nobre, L. and Domínguez García, I. (2016) 'Illustrating the Sabor Valley (Trás-os-Montes, Portugal): rock art and its long-term diachrony since the Upper Palaeolithic until the Iron Age' in R. Fábregas Valcarce and C. Rodríguez-Rellán (Eds.) *Public Images, Private Readings: Multi-Perspective Approaches to the Post-Palaeolithic Rock Art. Proceedings of the XVII UISPP World Congress (1-7 September 2014, Burgos, Spain)*, pp. 17-28. Oxford: Archaeopress.

Defrasne, C. (2014) 'Digital image enhancement for recording rupestrian engravings: applications to an alpine rockshelter' in *Journal of Archaeological Science*, Vol. 50, pp. 31-38.

de l'Isle, P. (1868) 'Notice sur des objets sculptés et graves des temps préhistoriques trouvés a Bruniquel (Tarn-et-Garonne)' in *Revue Archéologique*, Vol. 17, pp. 213-220.

Derevianko, A. P., Shunkov, M. V. and Volkov, P. V. (2008) 'A Paleolithic Bracelet from Denisova Cave' in *Archaeology, Ethnology and Anthropology of Eurasia*, Vol. 34, No. 2, pp. 13-25.

d'Errico, F., Henshilwood, C., Lawson, G., Vanhaeren, M., Tillier, A.-M., Soressi, M., Bresson, F., Maureille, B., Nowell, A., Lakarra, J., Backwell, L. and Julien, M. (2003) 'Archaeological Evidence for the Emergence of Language, Symbolism, and Music – An Alternative Multidisciplinary Perspective' in *Journal of World of Prehistory*, Vol. 17, No. 1, pp. 1-70.

d'Errico, F., Henshilwood, C. and Nilssen, P. (2001) 'An engraved bone fragment from c.70,000-year-old Middle Stone Age levels at Blombos Cave, South Africa: implications for the origin of symbolism and language' in *Antiquity*, Vol. 75, No. 288, pp. 309-318.

d'Errico, F., Henshilwood, C., Vanhaeren, M. and van Niekerk, K. (2005) '*Nassarius kraussianus* shell beads from Blombos Cave; evidence for symbolic behaviour in the Middle Stone Age' in *Journal of Human Evolution*, Vol. 48, pp. 3-24.

d'Errico, Moreno, R. G. and Rifkin, R. F. (2012) 'Technological, elemental and colorimetric analysis of an engraved ochre fragment from the Middle Stone Age levels of Klasies River Cave 1, South Africa' in *Journal of Archaeological Science*, Vol. 39, pp. 942-952.

d'Errico, F. and Nowell, A. (2000) 'A New Look at the Berekhat Ram Figurine: Implications for the Origins of Symbolism' in *Cambridge Archaeological Journal*, Vol. 10, No. 1, pp. 123-167.

d'Errico, F., Salomon, H., Vignaud, C. and Stringer, C. (2010) 'Pigments from the Middle Palaeolithic levels of Es-Skhul (Mount Carmel, Israel) in *Journal of Archaeological Science*, Vol. 37, pp. 3099-3110.

d'Errico, F., Vanhaeren, M. and Wadley, L. (2008) 'Possible shell beads from the Middle Stone Age layers of Sibudu Cave, South Africa' in *Journal of Archaeological Science*, Vol. 35, pp. 2675-2685.

Descartes, R. (2000) [1641] *Meditations and Other metaphysical Writings*. England: Penguin.

Dettwyler, K. A. (1991) 'Can paleopathology provide evidence for "compassion"?' in *American Journal of Physical Anthropology*, Vol. 84, No. 4, pp. 375-384.

de Waal, F. (2007) *Chimpanzee Politics: Power and Sex among Apes*. Baltimore: The John Hopkins University Press.

de Waal, F. (2008) 'Putting the Altruism Back into Altruism: The Evolution of Empathy' in *Annual Review of Psychology*, Vol. 59, pp. 279-300.

Díaz-Andreu, M., García Benito, C. and Lazarich M. (2014) 'The Sound of Rock Art: The Acoustics of the Rock Art of southern Andalusia (Spain)' in *Oxford Journal of Archaeology*, Vol. 33, No. 1, pp. 1-18.

Dixson, A. F. and Dixson, B. J. (2011) 'Venus figurines of the European Paleolithic: Symbols of Fertility or Attractiveness?' in *Journal of Anthropology*, Vol. 2011, DOI: 10.1155/2011/569120

Dobres, M.-A. (2000) *Technology and Social Agency: Outlining a Practice Framework for Archaeology*. Oxford: Blackwell.

Domingo, I., Villaverde, V., López-Montalvo, E., Lerma, J. L., Cabrelles, M. (2013) 'Latest developments in rock art recording: towards a integral documentation of Levantine rock art sites combining 2D and 3D recording techniques' in *Journal of Archaeological Science*, Vol. 40, pp. 1879-1889.

Dowson, T. A. (2009) 'Re-animating Hunter-gatherer Rock-art Research' in *Cambridge Archaeological Journal*, Vol. 19, No. 3, pp. 378-387.

Dowson, T. A. and Porr, M. (2003) 'Special objects – special creatures: Shamanistic imagery and Aurignacian art of south-west Germany' in N. Price (Ed.) *The Archaeology of Shamanism*, pg. 165-176. London: Routledge.

Drake, A. G., Coquerelle, M., and Colombeau, G. (2015) '3D morphometric analysis of fossil canid skulls contradicts the suggested domestication of dogs during the late Paleolithic' in *Scientific Reports*, Vol. 5, DOI: 10.1038/srep08299

Drucker, D. G., Bridault, A., Cupillard, C., Hujic, A. and Bocherens, H. (2011) 'Evolution of habitat and environment of red deer (*Cervus elaphus*) during the Late-glacial and early Holocene in eastern France (French Jura and the western Alps) using multi-isotope analysis ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{18}\text{O}$, $\delta^{34}\text{S}$) of archaeological remains' in *Quaternary International*, Vol. 245, pp. 268-278.

Drucker, D. G., Bridault, A. and Cupillard, C. (2012) 'Environmental context of the Magdalenian settlement in the Jura Mountains using stable isotope tracking (^{13}C , ^{15}N , ^{34}S) of bone collagen from reindeer (*rangifer tarandus*)' in *Quaternary International*, Vol. 272-273, pp. 322-332.

Drucker, D. G. and Henry-Gambier, D. (2005) 'Determination of the dietary habits of a Magdalenian woman from Saint-Germain-la-Rivière in southwestern France using stable isotopes' in *Journal of Human Evolution*, Vol. 49, pp. 19-35.

Duffy, S., Earl, G., Beale, G., Pagi, H. and Kotoula, E. (2011) *Multi-Light Imaging Technique(s) for Heritage Applications*. UK: English Heritage.

Duhard, J. P. (1991) 'The Shape of Pleistocene Women' in *Antiquity*, Vol. 65, No. 248, pp. 552-561.

Dumarçay, G. Caron, M. (2010) 'Pincevent and Verberie Rocks and Hearths: A Tentative Summary/Preliminary Analysis' In E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pp. 91-104. USA: State University of New York Press.

Dumont, L. (1996) 'A modified view of our origins: the Christian beginnings of modern individualism' in M. Carrithers, S. Collins and M. Lukes (Eds.) *The Category of the Person: Anthropology, Philosophy, History*, pp. 93-122. Cambridge: Cambridge University Press.

Dunbar, R. I. M. (2007) 'The Social Brain and the Cultural Explosion of the Human Revolution' in P. Mellars, K. Boyle, O. Bar-Yosef and C. Stringer (Eds.) *Rethinking the human revolution: new behavioural and biological perspectives on the origin and dispersal of modern humans*, pp. 91-98. Cambridge: McDonald Institute for Archaeological Research.

Dussart, F. (2006) 'The Warlpiri' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 363-366. Cambridge: Cambridge University Press.

Earl, G., Basford, P., Bischoff, A., Bowman, A., Crowther, C., Dahl, J., Hodgson, M., Isaksen, L., Kotoula, E., Martinez, K., Pagi, H. and Piquette, K. E. (2011) 'Reflectance Transformation Imaging Systems for Ancient Documentary Artefacts' in J. P. Bowen, S. Dunn, K. Stuart and K. Ng (eds.) *Eva London 2011: Electronic Visualisation and the Arts (Electronic Workshops in Computing)*, pp. 147-154. London: BCS.

Earl, G., Beale, G., Martinez, K. and Pagi, H. (2010) 'Polynomial Texture Mapping and Related Imaging Technologies for the Recording, Analysis and Presentation of Archaeological Materials' in *International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences*, Vol. XXXVIII, No. 5, pp. 218-223.

Earl, G., Martinez, K. and Malzbender, T. (2010) 'Archaeological applications of polynomial texture mapping: analysis, conservation and representation' in *Journal of Archaeological Science*, Vol. 37, pp. 2040-2050.

Edmonds, M. (1990) 'Description, Understanding and the Chaîne opératoire' in *Archaeological Review from Cambridge*, Vol. 9, No. 1, pp. 54-70.

Eder, J. F. (2006) 'The Batak of Palawan Island, the Phillipines' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 294-297. Cambridge: Cambridge University Press.

El Zaatari, S. and Hublin, J.-J. (2014) 'Diet of Upper Paleolithic Modern Humans: Evidence from Microwear Texture Analysis' in *American Journal of Physical Anthropology*, Vol. 153, pp. 570-581.

Endicott, K. (2006) 'The Batek' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 298-302. Cambridge: Cambridge University Press.

Engen, M. and Spikins, P. (2007) 'A needle in a haystack? Perspectives on prospection for submerged Mesolithic sites' in C. Waddington and K. Pedersen (Eds.) *Mesolithic Studies in the North Sea Basin and Beyond*, pp. 25-32. Oxford: Oxbow Books.

Enloe, J. (2001) 'Magdalenian' in P. N. Peregrine and M. Ember (Eds.) *Encyclopedia of Prehistory Vol. 4*, pp. 179-190. USA: Springer US.

Enloe, J. G. (2010) 'Technology and Demographics: An Introduction' In E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pp. 11-14. USA: State University of New York Press.

Enloe, J. G. (2010) 'Fauna and Site Structure at Verberie: Implications for Domesticity and Demography' in E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pp. 22-50. USA: State University of New York Press.

- Enloe, J. G. and Audouze, F. (2010) 'The Magdalenian Site of Verberie (Le Buisson Campin): An Overview' in E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pp. 15-21. USA: State University of New York Press.
- Espmark, Y. (1963) 'Rutting Behaviour in Reindeer (*Rangifer tarandus* L.)' in *Animal Behaviour*, Vol. 12, No. 1, pp. 159-163.
- Epmark, Y. (1974) 'Individual Characteristics in the Calls of Reindeer Calves' in *Behaviour*, Vol. 52, pp. 50-59.
- Fagan, B. (2014) 'Sanz de Sautuola and Henri Breuil 1831-88 and 1877-1961 finding the earliest art' in B. Fagan (Ed.) *The Great Archaeologists*, pp. 34-39. United Kingdom: Thames and Hudson.
- Farbstein, R. (2011a) 'The Significance of Social Gestures and Technologies of Embellishment in Paleolithic Portable Art' in *Journal of Archaeological Method and Theory*, Vol. 18, pp. 125-146.
- Farbstein, R. (2011b) 'Technologies of Art: A Critical Reassessment of pavlovian Art and Society, Using *Chaîne Opératoire* Method and Theory' in *Current Anthropology*, Vol. 52, No. 3, pp. 401-432.
- Farbstein, R. (2013a) 'The Materiality of Production: Exploring Variability and Choice in the Production of Palaeolithic Portable Art made in Antler and Bone' in A. Choyke and S. O'Connor (Eds.) *From These Bare Bones: Raw material and the study of worked osseous objects*, pp. 98-108. Oxford: Oxbow Books.
- Farbstein, R. (2013b) 'Making art, making society: the social significance of small-scale innovations and experimentation in Palaeolithic portable art' in *World Art*, Vol. 3, No. 1, pp. 23-39.
- Feit, H. A. (2006) 'James Bay Cree' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 41-45. Cambridge: Cambridge University Press.
- Ferguson, J. R. (2008) 'The when, where and how of novices in craft production' in *Journal of Archaeological Method and Theory*, Vol. 15, No. 1, pp. 51-67.
- Fiedel, S. J. (2005) 'Man's best friend – mammoth's worst enemy? A speculative essay on the role of dogs in Paleoindian colonization and megafaunal extinction' in *World Archaeology*, Vol. 37, No. 1, pp. 11-25.

- Fiedorczuk, J., Bratlund, B., Kolstrup, E. and Schild, R. (2007) 'Late Magdalenian feminine flint plaquettes from Poland' in *Antiquity*, Vol. 81, No. 311, pp. 97-105.
- Figueiredo, S. S., Nobre, L., Gaspar, R., Carrondo, J., Cristo Ropero, A., Ferreira, J., Silva, M. J. D., and Molina, F. J. (2014) 'Foz do Medal Terrace –An Open-Air Settlement with Paleolithic Portable Art' in *International Newsletter on Rock Art*, Vol. 68, pp. 12-20.
- Figuier, L. (1870) *Primitive Man*. London: Chapman and Hall.
- Finlay, N. (2003) 'Microliths and Multiple Authorship' in H. Kindgren, K. Knutsson, D. Loeffler and A. Åkerlund (Eds.) *Mesolithic on the Move. Papers Presented at the Sixth International Conference on the Mesolithic on Europe, Stockholm 2000*, pp. 169-176. Oxford: Oxbow Books.
- Finlay, N. (2014) 'Personhood and social relations' in V. Cummings, P. Jordan and M Zvelebil (Eds.) *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*, DOI 10.1093/oxfordhb/9780199551224.013.036
- Finlayson, C., Brown, K., Blasco, R., Rosell, J., José Negro, J., Bortoletti, G. R., Finlayson, G., Sánchez Moreno, A., Giles Pacheco, F., Rodríguez Vidal, J., Carrión, J. S., Fa, D. A., Rodríguez Llanes, J. M. (2012) 'Birds of a Feather: Neanderthal Exploitation of Raptors and Corvids' in *PLoS ONE*, Vol. 7, No. 9, e45927.
- Formicola, V., Pontrandolfi, A. and Svoboda, J. (2001) 'The Upper Palaeolithic Triple Burial of Dolni Věstonice: Pathology and Funerary Behaviour' in *American Journal of Physical Anthropology*, Vol. 115, pp. 372-379.
- Fowler, C. (2001) 'Personhood and Social Relations in the British Neolithic with a Study from the Isle of Man' in *Journal of Material Culture*, Vol. 6, pp. 137-163.
- Fowler, C. (2004a) *The Archaeology of Personhood: An Anthropological Approach*. London: Routledge.
- Fowler, C. (2004b) 'Identity Politics: Personhood, Kinship, Gender and Power in Neolithic and Early Bronze Age Britain' in E. C. Casella and C. Fowler (2004) *The Archaeology of Plural and Changing Identities*, pp. 109-134. USA: Springer.
- Fowler, C. S. (2006) 'The Timbisha Shoshone of Death Valley' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 66-70. Cambridge: Cambridge University Press.

Frahm, E. and Doonan, R. C. P. (2013) 'The technological versus methodological revolution of portable XRF in archaeology' in *Journal of Archaeological Science*, Vol. 40, pp. 1425-1434.

Freyer, D. W., Horton, W. A., Macchiarelli, R. and Mussi, M. (1987) 'Dwarfism in an adolescent from the Italian late Upper Palaeolithic' in *Nature*, Vol. 330, pp. 60-62.

Freyer, D. W., Macchiarelli, R. and Mussi, M. (1988) 'A Case of Chondrodystrophic Dwarfism in the Italian Late Upper Paleolithic' in *American Journal of Physical Anthropology*, Vol. 75, pp. 549-565.

Fritz, C. (1999) 'Towards the Reconstruction of Magdalenian Artistic Techniques: the contribution of Microscopic Analysis of Mobiliary Art' in *Cambridge Archaeological Journal*, Vol. 9, No. 2, pp. 189-208.

Fritz, C. and Tosello, G. (2007) 'The Hidden Meaning of Forms: Methods of Recording Palaeolithic Art' in *Journal of Archaeological Method and Theory*. Vol. 14, No. 1, pp. 48-80.

Fritz, C. and Tosello, G. (2011) 'Exceptional evidence for Palaeolithic art in the Paris Basin: the engraved pebble from Étioilles (Essonne)' in *Bulletin de la Société préhistorique française*, Vol. 108, No. 1, pp. 27-46.

Fritz, C., Tosello, G. and Conkey, M. (2016) 'Reflections on the Identities and Roles of the Artists in European Paleolithic Societies' in *Journal of Archaeological Method and Theory*, Vol. 23, pp. 1307-1332.

Froese, T., Woodward, A. and Ikegami, T. (2014) 'Are altered states of consciousness sentimental, neutral or helpful for the origins of symbolic cognition? A response to Hodgson and Lewis-Williams' in *Adaptive Behaviour*, Vol. 22, No. 1, pp. 89-95.

Frost, R. (1987) 'Comment' in *Current Anthropology*, Vol. 28, No. 1, pp. 77-79.

Fuentes, O. (2016) 'The social dimension of human depiction in Magdalenian rock art (16,500 cal. BP-12,000 cal. BP): The case of the Roc-aux-Sorciers rock-shelter' in *Quaternary International*, doi.org/10.1016/j.quaint.2016.06.023.

Gaffney, V. and Fitch, S. (2009) *Europe's Lost World: The rediscovery of Doggerland*. York: Council for British Archaeology.

Gaffney, V., Thomson, K. and Fitch, S. (2007) *Mapping Doggerland: The Mesolithic Landscapes of the Southern North Sea*. Oxford: Archaeopress.

Gamble, C. (1982) 'Interaction and Alliance in Palaeolithic Society' in *Man*, New Series, Vol. 17, No. 1, pp. 92-107.

Gamble, C., Davies, W., Pettitt, P., Hazelwood, L. and Richards, M. (2005) 'The Archaeological and Genetic Foundations of the European Population during the Late Glacial: Implications for 'Agricultural Thinking'' in *Cambridge Archaeological Journal*, Vol. 15, No. 2, pp. 193-223.

Gamble, C., Gowlett, J. and Dunbar, R. (2011) 'The Social Brain and the Shape of the Palaeolithic' in *Cambridge Archaeological Journal*, Vol. 21, No. 1, pp. 115-136.

Gamble, C. and Kruszynski, R. (2009) 'John Evans, Joseph Prestwich and the stone that shattered the time barrier' in *Antiquity*, Vol. 83, No. 320, pp. 461-475.

García-Diez, M., Garrido, D., Hoffmann, D. L., Pettitt, P. B., Pike, A. W. and Zilhão, J. (2015) 'The chronology of hand stencils in European Palaeolithic rock art: implications of new U-series results from El Castillo Cave (Cantabria, Spain)' in *Journal of Anthropological Sciences*, Vol. 93, pp. 1-18.

García-González, R., Carretero, J. M., Richards, M. P., Rodríguez, L. and Quam, R. (2015) 'Dietary inferences through dental microwear and isotope analyses of the Lower Magdalenian individual from El Mirón Cave (Cantabria, Spain)' in *Journal of Archaeological Science*, Vol. 60, pp. 28-38.

García-Guixè, E., Martínex-Moreno, J., Mora, R., Núñez, M. and Richards, M. P. (2009) 'Stable isotope analysis of human and animal remains from the Late Upper Palaeolithic site of Balma Guilanyà, southeastern Pre-Pyrenees, Spain' in *Journal of Archaeological Science*, Vol. 36, pp. 1018-1026.

García Moreno, A. and Garate, D. (2015) 'Low-Cost Photogrammetry and 3D Scanning: the Documentation of Palaeolithic Parietal Art in El Niño Cave' in A. Chrysanthi, D. Wheatley, I. Romanawska, C. Papadopoulos, P. Murrieta-Flores, T. Sly, G. Earl, and P. Verhagen (Eds.) *Archaeology in the Digital Era*, pp. 344-349. Amsterdam: Amsterdam University Press.

Gardner, P. M. (2006) 'The paliyan' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 261-264. Cambridge: Cambridge University Press.

Gargett, R. H. (1989) 'Grave Shortcomings: The Evidence for Neanderthal Burial' in *Current Anthropology*, Vol. 30, No. 2, pp. 157-190.

Gargett, R. H. (1999) 'Middle Palaeolithic Burial is not a dead issue: the view from Quafzeh, Saint-Césaire, Kebara, Amud, and Dederiyeh' in *Journal of Human Evolution*, Vol. 37, pp. 27-90.

Garrod, D. A. E. (1926) *The Upper Paleolithic Age in Britain*. London: Oxford University Press.

Garrod, D. E. (1955) 'Palaeolithic Spear-Throwers' in *Proceedings of the Prehistoric Society*, Vol. 3, pp. 20-35.

Gaudzinski-Windheuser, S. (2012) 'Indication for social interaction during the Central European Late Upper Palaeolithic: Evidence from the Magdalenian site of Oelknitz, Structure 1 (Thuringia, Germany)' in *Quaternary International*, Vol. 252, pp. 165-174.

Gaudzinski-Windheuser, S. and Jöris, O. (2015) 'Contextualising the female image: Symbols for common ideas and community identity in Upper Palaeolithic societies' in F. S. Coward, R. Hosfield, M. Pope and F. F. Wenban-Smith (Eds.) *Settlement, Society and Cognition in Human Evolution: Landscapes in the Mind*, pp. 288-314. Cambridge: Cambridge University Press.

Gaydarska, B. and Chapman, J. (2008) 'The Aesthetics of Colour and Brilliance – Or Why Were Prehistoric Persons Interested in Rocks, Minerals, Clays and Pigments?' in R. I. Kostov, B. Gaydarska and M. Gurova (Eds.) *Geoarchaeology and Archaeomineralogy: Proceedings of the International Conference, 29-30 October 2008 Sofia*, pp. 63-66. Sofia: St. van Rilski.

Gaydarska, B., Chapman, J., Raduncheva, A. and Koleva, B. (2007) 'The *Chaîne Opératoire* Approach to Prehistoric Figurines: an Example from Dolnoslav, Bulgaria' in C. Renfrew and I. Morley (Eds.) *Image and Imagination: a global prehistory of figurative representation*, pp. 171-184. Cambridge: Oxbow Books.

Germonpré, M., Lázkičková-Galetová, M. and Sablin, M. V. (2012) 'Palaeolithic dog skulls at the Gravettian Předmostí site, the Czech Republic' *Journal of Archaeological Science*, Vol. 39, pp. 184-202.

Germonpré, M., and Sablin, M. V., Després, V., Hofreiter, M., Lázkičková-Galetová, M., Stevens, R. A. and Stiller, M. (2013) 'Palaeolithic dogs and the early domestication of the

wolf: a reply to the comments of Crockford and Kuzmin (2012)' in *Journal of Archaeological Science*, Vol. 40, pp. 786-792.

Germonpré, M., Sablin, M. V., Stevens, R. E., Hedges, R. E. M., Hofreiter, M., Stiller, M. and Després, V. R. (2009) 'Fossil dogs and wolves from Palaeolithic sites in Belgium, the Ukraine and Russia: osteometry, ancient DNA and stable isotopes' in *Journal of Archaeological Science*, Vol.36, pp. 473-490.

Giraud, J.-P., Rouzaud, F., Bégouën, R. and Clottes, J. (1982) 'Plaquette grave d'Enlène, Montesquieu Avantés (Ariège)' in *Bulletin Societe Préhistorique Français*, Tome 79, pp. 103-109.

Golovnev, A. V. (2006) 'The Nia (Nganasan)' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 166-169. Cambridge: Cambridge University Press.

Gonzalez-Aguilera, D., Muñoz, A. L., Lahoz, J. G., Herrero, J. S., Corchón, M. S. García, E. (2009) 'Recording and modelling of Palaeolithic caves through laser scanning' in S. Dragicevic, D. Roman and V. Tanasescu (Eds.) *Proceedings of the International Conference on Advanced Geographic Information Systems and Web Services GEOWS 2009*, pp. 19-26. USA: IEEE Computer Services.

González-Aguilera, D., Muñoz-Nieto, A., Gómez-Lahoz, J., Herrero Pascual, J., Gutierrez-Alonso, G. (2009) '3D Digital Surveying and Modelling of Cave Geometry: Application to Paleolithic Rock Art' in *Sensors*, Vol. 9, pp. 1108-1127.

González-Morales, M. G. and Straus, L. G. (2015) 'Magdalenian-age graphic activity associated with the El Mirón Cave human burial' in *Journal of Archaeological Science*, Vol. 60, pp. 125-133.

González-Ruibal, A. (2016) 'Ethnoarchaeology or simply archaeology' in *World Archaeology*, DOI: <http://dx.doi.org/10.1080/00438243.2016.1209125>.

Goodale, J. C. (2006) 'The Tiwi of Melville and Bathurst Islands, north Australia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 353-357. Cambridge: Cambridge University Press.

Gordillo, G. (2006) 'The Toba of the Argentine Chaco' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 110-113. Cambridge: Cambridge University Press.

Gosden, C. (2005) 'Comments on A. Jones, 'Archaeometry and Materiality: Materials-Based Analysis in Theory and Practice'', *Archaeometry*, 46(3), 327-338, 2004, and Reply. Comments III: Is Science a Foreign Country?' in *Archaeometry*, Vol. 47, No. 1, pp. 182-185.

Gosden, C. and Marshall, Y. (1999) 'The cultural biography of objects' in *World Archaeology*, Vol. 31, No. 2, pp. 169-178.

Grant, B. (2006) 'The Nivkh of Sakhalin Island' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 170-173. Cambridge: Cambridge University Press.

Graziosi, P. (1960) *Paleolithic Art*. New York: McGraw-Hill.

Green, R. E., Krause, J., Biggs, A. W., Maricic, T., Stenzel, U., Kircher, M., Patterson, N., Li, H., Zhai, W., Hsi-Yang Fritz, M., Hansen, N. F., Durand, E. Y., Malaspinas, A.-S., Jensen, J. D., Marques-Bonet, T., Alkan, C., Prüfer, K., Meyer, M., Burbano, H. A., Good, J. M., Schultz, R., Aximu-Petri, A., Butthof, A., Höber, B., Höffner, B., Siegemund, M., Weihmann, A., Nusbaum, C., Lander, E. S., Russ, C., Novod, N., Affourtit, J., Egholm, M., Verna, C., Rudan, P., Brajkovic, D., Kucan, Ž., Gušić, I., Doronichev, V. B., Golovanova, L. V., Lalueza-Fox, C., de la Rasilla, M., Fortea, J., Rosas, A., Schmitz, R. W., Johnson, P. L. F., Eichler, E. E., Falush, D., Birney, E., Mullikin, J. C., Slatkin, M., Nielsen, R., Kelso, J., Lachmann, M., Reich, D. and Pääbo, S. (2010) 'A draft Sequence of the Neanderthal Genome' in *Science*, Vol. 329, No. 5979, pp. 710-722.

Green, R. E., Krause, J., Ptak, S. E., Biggs, A. W., Ronan, M. T., Simons, J. F., Du, L., Egholm, M., Rothberg, J. M. Paunovic, M. and Pääbo, S. (2006) 'Analysis of one million base pairs of Neanderthal DNA' in *Nature*, Vol. 444, pp. 330-336.

Greensmith, J. T., Hatch, F. H. and Rastall, R. H. (1971) *Petrology of the Sedimentary Rocks*. London: Murby.

Griffin, P. B. and Griffin, M. B. (2006) 'The Age of eastern Luzon, Phillipines' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 289-293. Cambridge: Cambridge University Press.

- Grimm, D. (2015) 'Dawn of the dog' in *Science*, Vol. 348, No. 6232, pp. 274-279.
- Grimm, L. (2000) 'Apprentice flintknapping: Relational material culture and social practice in the Upper Palaeolithic' in J. Sofaer Derevenski (Ed.) *Children and Material Culture*, pp. 53-71. London: Routledge.
- Grosman, L., Smikt, O. and Smilansky, U. (2008) 'On the application of 3-D scanning technology or the documentation and typology of lithic artefacts' in *Journal of Archaeological Science*, Vol. 35, pp. 3101-3110.
- Grøn, O. and Skaarup, J. (1991) 'Møllegabet II – A Submerged Mesolithic Site and a "Boat Burial" from Ærø' in *Journal of Danish Archaeology*, Vol. 10, pp. 38-50.
- Grosman, L., Munro, N. D. and Belfer-Cohen, A. (2008) 'A 12,000-year-old Shaman burial from the southern Levant (Israel)' in *Proceedings of the National Academy of Sciences*, Vol. 105, No. 46, pp. 17665-17669.
- Grünberg, J. M. (2002) 'Middle Palaeolithic birch-bark pitch' in *Antiquity*, Vol. 76, No. 291, pp. 15-16.
- Grussenmeyer, P., Burens, A., Moisan, E., Guillemin, S., Carozza, L., Bourillon, R. and Petrognani, S. (2012) '3D Multi-scale Scanning of the Archaeological Cave "Les Fraux" in Dordogne (France)' in M. Ioannides, D. Fritsch, J. Leissner, R. Davies, F. Remondino and R. Caffo (Eds.) *Progress in Cultural Heritage Preservation 4th International Conference, EuroMed 2012, Limassol, Cyprus, October 29 – November 3, 2012. Proceedings*, pp. 388-395. Berlin: Springer.
- Grussenmeyer, P., Landes, T., Alby, E. and Carozza, L. (2010) 'High Resolution 3D Recording and Modelling of the Bronze Age Cave "Les Fraux" in Perigord (France)' in *International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences*, Vol. XXXVIII, No. 5, pp. 262-266.
- Gustafsson, P. (2014) 'It is not all about quartz – raw material use as a mean to understand colonization processes during early post glacial time in Eastern Central Sweden' in F. Riede and M. Tallaavaara (Eds.) *Lateglacial and Postglacial Pioneers in Northern Europe. British Archaeological Reports International Series 2559*, pp. 79-90. Oxford: Archaeopress.
- Güth, A. (2012) 'Using 3D scanning in the investigation of Upper Palaeolithic engravings: first results of a pilot study' in *Journal of Archaeological Science*, Vol. 39, pp. 3105-3114.

- Guthrie, D. (2005) *The Nature of Paleolithic Art*. Chicago: The University of Chicago Press.
- Guthrie, R. D. (2006) 'Human-Horse Relations using Paleolithic Art: Pleistocene Horses Drawn from Life' in S. L. Olsen, S. Grant, A. M. Choyke, L. Bartosiewicz (Ed.) *Horses and Humans: The Evolution of Human-Equine Relationships* pp. 61-77. Oxford: Archaeopress.
- Gvozdover, M. (1995) *Art of the Mammoth Hunters: The finds from Avdeevo*. Oxford: Oxbow Books.
- Gvozdover, M. D. (1989) 'The Typology of Female Figurines of the Kostenki Paleolithic Culture' in *Soviet Anthropology and Archaeology*, Vol. 27, No. 4, pp. 32-94.
- Hackett, A. and Dennell, R. (2003) 'Neanderthal as fiction in archaeological narrative' in *Antiquity*, Vol. 77, No. 298, pp. 816-827.
- Halverson, J. (1987) 'Art for Art's Sake in the Palaeolithic [and Comments and Reply]' in *Current Anthropology*, Vol. 28, No. 1, pp. 63-89.
- Hamon, C. (2016) 'Debates in ethnoarchaeology today: a new crisis of identity or the expression of a vibrant research strategy' in *World Archaeology*, DOI: <http://dx.doi/10.1080/00438243.2016.1234409>.
- Haraway, D. (2003) *The Companion Species Manifesto: Dogs, People and Significant Otherness*. Chicago: Prickly Paradigm Press.
- Haraway, D. J. (2008) *When Species Meet*. Minneapolis: University of Minnesota Press.
- Harding, J. R. (1976) 'Certain Upper Palaeolithic 'Venus' Statuettes Considered in Relation to the Pathological Condition Known as Massive Hypertrophy of the Breasts' in *Man*, Vol. 11, No. 2, pp. 271-272.
- Hardy, B. and Moncel, M.-H. (2011) 'Neanderthal Use of Fish, Mammals, Birds, Starchy Plants and Wood 125-250,000 Years Ago' in *PLoS ONE*, Vol. 6, No. 8, e23768.
- Hardy, K. (2008) 'Prehistoric string theory. How twisted fibres helped to shape the world' in *Antiquity*, Vol. 82, pp. 271-280.
- Harris, O. J. T. (2013) 'Relational communities in prehistoric Britain' in C. Watts (Ed.) *Relational Archaeologies: Humans, Animals, Things*, pp. 173-190. London and New York: Routledge.

Harrison, S. (1993) *The Mask of War: Violence, ritual and the self in Melanesia*. Manchester: Manchester University Press.

Harter, S. (1999) *The Construction of Self: A Developmental Perspective*. New York: The Guildford Press.

Hausberger, M., Roche, H., Henry, S. and Visser, E. K. (2008) 'A review of the human-horse relationship' in *Applied Animal Behaviour Science*, Vol. 109, pp. 1-24.

Hawkes, C. (1954) 'Archaeology theory and method: some suggestions from the Old World' in *American Anthropology*, Vol. 56, pp. 155-168.

Hayden, B. (2012) 'Neanderthal Social Structure' in *Oxford Journal of Archaeology*, Vol. 31, No. 1, pp. 1-26.

Helvenston, P. A. and Bahn, P. G. (2003) 'Testing the 'Three Stages of Trance' model with comments by J.L. Bradshaw and C. Chippindale' in *Cambridge Archaeological Journal*, Vol. 13, No. 2, pp. 213-224.

Helvenston, P. A. and Bahn, P. G. (2004) 'Waking the Trance-Fixed' in *Cambridge Archaeological Journal*, Vol. 14, No. 1, pp. 90-100.

Helvenston, P. A. and Hodgson, D. (2010a) 'The Neuropsychology of 'Animism': Implications for Understanding Rock Art' in *Rock Art Research*, Vol. 27, No. 1, pp. 61-94.

Helvenston, P. A. and Hodgson, D. (2010b) 'Rock art and flexibility in animism as informed by neuropsychology' in *Rock Art Research* Vol. 27, No. 1, pp. 82-88.

Henare, A., Holbraad, M. and Wastell S. (2007) *Thinking Through Things: Theorising Artefacts Ethnographically*. London and New York: Routledge.

Henare, A., Holbraad, M. and Wastell, S. (2007) 'Introduction: thinking through things' in A. Henare, M. Holbraad and S. Wastell (Eds.) *Thinking Through Things: Theorising Artefacts Ethnographically*, pp. 1-31. London and New York: Routledge.

Henrich, J., Heine, S. J. and Norenzayan, A. (2010a) 'The weirdest people in the world' in *Behavioural and Brain Sciences*, Vol. 33, pp. 61-135.

Henrich, J., Heine, S. J. and Norenzayan, A. (2010b) 'Most people are not WEIRD' in *Nature*, Vol. 466, pp. 29.

Henshilwood, C. S. (2007) 'Fully Symbolic *Sapiens* Behaviour: Innovations in the Middle Stone Age at Blombos Cave, South Africa' in P. Mellars, K. Boyle, O. Bar-Yosef and C. Stringer (Eds.) *Rethinking the Human Revolution: new behavioural and biological perspectives on the origin and dispersal of modern humans*, pp. 123-132. Cambridge: McDonald Institute for Archaeological Research.

Henshilwood, C. S., d'Errico, F., van Niekerk, K. L., Coquinot, Y., Jacobs, Z., Lauritzen, S.-E., Menu, M. and García-Moreno, R. (2011) 'A 100,000-Year-Old Ochre-Processing Workshop at Blombos Cave, South Africa' in *Science*, Vol. 334, pp. 219-222.

Henshilwood, C. S., d'Errico, F. and Watts, I. (2009) 'Engraved ochres from the Middle Stone Age levels at Blombos Cave, South Africa' in *Journal of Human Evolution*, Vol. 57, pp. 27-47.

Herva, V.-P. and Ikäheimo, J. (2002) 'Defusing Dualism: Mind, Materiality and Prehistoric art' in *Norwegian Archaeological Review*, Vol. 35, No. 2, pp. 95-108.

Hewlett, B. S., Fouts, H. N., Boyette, A. H., Hewlett, B. L. (2011) 'Social learning among Congo Basin hunter-gatherers' in *Philosophical Transactions of the Royal Society B*, Vol. 366, pp. 1168-1178.

Hewlett, B. S. and Roulette, C. J. (2015) 'Teaching in hunter-gatherer infancy' in *Royal Society Open Science*, Vol. 3, <http://dx.doi.org/10.1098/rsos.150403>.

Hill, E. (2011) 'Animals as Agents: Hunting Ritual and Relational Ontologies in Prehistoric Alaska and Chukotka' in *Cambridge Archaeological Journal*, Vol. 21, No. 3, pp. 407-426.

Hill, K. and Hurtado, M. (2006) 'The Aché of Paraguay' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 92-96. Cambridge: Cambridge University Press.

Hiller, J. C., Thompson, T. J. U., Evison, M. P., Chamberlain, A. T. and Wess, T. J. (2003) 'Bone mineral change during experimental heating: an X-ray scattering investigation' in *Biomaterials*, Vol. 24, pp. 5091-5097.

Higham, T., Basell, L., Jacobi, R., Wood, R., Bronk Ramsey, C. and Conard, N. J. (2012) 'Testing models for the beginnings of the Aurignacian and the advent of figurative art and music: The radiocarbon chronology of Geißenlößterle' in *Journal of Human Evolution*, Vol. 62, pp. 664-676.

- Hitchcock, R. K. (2006) 'The Tyua of Northeastern Botswana and Western Zimbabwe' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 225-229. Cambridge: Cambridge University Press.
- Hodder, I. (2011) 'Human-thing entanglement: towards an integrated archaeological perspective' in *Journal of the Royal Anthropological Institute*, Vol. 17, pp. 154-177.
- Hodder, I. (2012) *Entangled: An Archaeology of the Relationships between Humans and Things*. UK: Wiley-Blackwell.
- Hodder, I. (2014) 'The Entanglements of Humans and Things: A Long-Term View' in *New Literary History*, Vol. 45, pp. 19-36.
- Hodge McCoid, C. and McDermott, L. D. (1996) 'Toward Decolonizing Gender: Female Vision in the Upper Paleolithic' in *American Anthropologist*, Vol. 98, No. 2, pp. 319-326.
- Hodgskiss, T. (2010) 'Identifying grinding, scoring and rubbing use-wear on experimental ochre pieces' in *Journal of Archaeological Science*, Vol. 37, pp. 3344-3358.
- Hodgson, D. (2000) 'Shamanism, Phosphenes, and Early Art: An Alternative Synthesis' in *Current Anthropology*, Vol. 41, No. 5, pp. 866-873.
- Hodgson, D. (2003a) 'Seeing the 'Unseen': Fragmented Cues and the Implicit in Palaeolithic Art' in *Cambridge Archaeological Journal*, Vol. 13, No. 1, pp. 97-106.
- Hodgson, D. (2003b) 'The Biological Foundations of Upper Palaeolithic Art: Stimulus, Percepts and Representational Imperatives' in *Rock Art Research*, Vol. 20, No. 1, pp. 3-22.
- Hodgson, D. (2008) 'The Visual Dynamics of Upper Palaeolithic Cave Art' in *Cambridge Archaeological Journal*, Vol. 18, No. 3, pp. 341-353.
- Hofmann, D. (2013) 'Intimate connection: bodies and substances in flux in the early Neolithic of central Europe' in C. Watts (Ed.) *Relational Archaeologies: Humans, Animals, Things*, pp. 154-172. London and New York: Routledge.
- Högberg, A. (2008) 'Playing with Flint: Tracing a Child's Imitation of Adult Work in a Lithic Assemblage' in *Journal of Archaeological Method and Theory*, Vol. 15, pp. 112-131.
- Hollan, D. (1992) 'Cross-Cultural Differences in the Self' in *Journal of Anthropological Research*, Vol. 48, No. 4, pp. 283-300.

Hollis, M. (1996) 'Of masks and men' in M. Carrithers, S. Collins and M. Lukes (Eds.) *The Category of the Person: Anthropology, Philosophy, History*, pp. 217-233. Cambridge: Cambridge University Press.

Hoskins, J. (1998) *Biographical Objects: How Things Tell the Stories of Peoples' Lives*. USA: Routledge.

Hoskins, J. (2009) 'Agency, Biography and Objects' in C. Tilley, W. Keane, S. Küchler, M. Rowlands and P. Spyder (Eds.) *Handbook of Material Culture*, pp. 74-84. London: Sage.

Hovers, E., Kimbel, W. H. and Rak, Y. (2000) 'The Amud 7 Skeleton – still a burial. Response to Gargett' in *Journal of Human Evolution*, Vol. 39, pp. 253-260.

Hovers, E. and Belfer-Cohen, A. (2012) 'Insights into early mortuary practices of Homo' in S. Tarlow and L. Nilsson Stutz (Eds.) *The Oxford Handbook of the Archaeology of Death and Burial*, DOI 0.1093/oxfordhb/9780199569069.001.0001, Oxford: Oxford University of Press.

Housley, R. A., Gamble, C. and Pettitt, P. (2000) 'Reply to Blockley, Donahue and Pollard' in *Antiquity*, Vol. 74, No. 283, pp. 119-121.

Housley, R. A., Gamble, C. S., Street, M. and Pettitt, P. (1997) 'Radiocarbon evidence for Lateglacial Human Recolonisation of northern Europe' in *Proceedings of the Prehistoric Society*, Vol. 63, pp. 25-54.

Humphrey, N. (1998) 'Cave Art, Autism, and the Evolution of the Human Mind' in *Cambridge Archaeological Journal*, Vol. 8, No. 2, pp. 165-191.

Humphries, C. J. and Huxley, R. (2007) 'Carl Linnaeus: The Man who Brought Order to Nature' in R. Huxley (Ed.) *The Great Naturalists*, pp. 132-139. UK: Thames and Hudson.

Hussain, S. and Floss, H. (2015a) 'Sharing the world with mammoths, cave lions and other beings: linking animal-human interactions and the Aurignacian "belief world"' in *Quartär*, Vol. 62, pp. 85-120.

Hussain, S. T. and Floss, H. (2015b) 'Regional ontologies in the Early Upper Palaeolithic: the place of mammoth and cave lion in the 'belief world' (*glaubenswelt*) of the Swabian Aurignacian' in P. Bueno-Ramírez and P. Bahn (Eds.) *Prehistoric Art as Prehistoric Culture: Studies in Honour of Professor Rodrigo de Balbín-Behrmann*, pp. 45-57. Oxford: Archaeopress.

- Hutchins, E. (1995) *Cognition in the Wild*. USA: The MIT Press.
- Hutchings, W. K. and Brüchert, L. W. (1997) 'Spearthrower performance: ethnographic and experimental research' in *Antiquity*, Vol. 71, pp. 890-897.
- Ichikawa, M. (2006) 'The Mbuti of the northern Congo' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 210-214. Cambridge: Cambridge University Press.
- Ingold, T. (2000) *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. London: Routledge.
- Ingold, T. (2006) 'Re-Thinking the Animate, Re-animating Thought' in *Ethnos*, Vol. 71, No. 1, pp. 9- 20.
- Ingold, T. (2012) 'Towards an Ecology of Materials' in *Annual Review of Anthropology*, Vol. 41, pp. 427-442.
- Ivanov, A. M. (2006) 'The Iukagir' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 152-155. Cambridge: Cambridge University Press.
- Jacobi, R. M., Higham, T. F. G. and Lord, T. (2009) 'Improving the chronology of human occupation of Britain during the Late Glacial' in M. Street, N. Barton and T. Terberger (Eds.) in *Humans, Environment and Chronology of the Late Glacial of the North European Plain*, pp. 7-26. Germany: Römisch-Germanisches Zentralmuseum.
- Jalles-Filho, E., Teixeira de Cunha, R. G. and Salm, R. A. (2001) 'Transport of tools and mental representations: is capuchin monkey tool behaviour a useful model of Plio-Pleistocene hominid technology?' in *Journal of Human Evolution*, Vol. 40, pp. 365-377.
- Janik, L. D. (2007) 'Animism in the rock art and material culture of prehistoric Siberia' in D. A. Barrowclough and C. A. T. Malone (Eds.) *Cult in context: reconsidering ritual in archaeology*, pp. 191-197. Oxford: Oxbow.
- Jochim, M. A. (1995) 'Two Late Paleolithic Sites on the Federsee, Germany' in *Journal of Field Archaeology*, Vol. 22, No. 3, pp. 263-273.
- Jochim, M., Herhahn, C. and Starr, H. (1999) 'The Magdalenian Colonization of Southern Germany' in *American Anthropologist*, Vol. 101, No. 1, pp. 129-142.

Jones, A. (2004a) 'Archaeometry and Materiality: Material-Based Analysis in Theory and Practice' in *Archaeometry*, Vol. 46, No. 3, pp. 327-338.

Jones, A. (2004b) 'Matter and Memory: Colour, Remembrance and the Neolithic/Bronze Age Transition' in E. DeMarrais, C. Gosden and C. Renfrew (Eds.) *Rethinking Materiality: the engagement of mind with the material world*, pp. 167-178. Cambridge: Oxbow Books.

Jones, A. (2005) 'Archaeometry and Materiality: Materials-Based Analysis in Theory and Practice', *Archaeometry*, 46(3), 327-338, 2004, and Reply. Reply' in *Archaeometry*, Vol. 47, No. 1, pp. 201-207.

Jones, A. M. (2014) 'The Cave and the Mind: Towards a Sculptural and Experimental Approach to Upper Palaeolithic Art' in I. A. Russell, A Cochrane (Eds.) *Art and Archaeology: Collaborations, Conversations, Criticisms*, pp. 21-34. New York: Springer.

Joordens, J. C. A., d'Errico, F., Wesselingh, F. P., Munro, S., de Vos, J., Wallinga, J., Ankjærgaard, C., Reimann, T., Wijbrans, J. R., Kuiper, K. F., Mûcher, H. J., Coqueugniot, H., Prié, V., Joosten, I., van Os, B., Schulp, A. S., Panuel, M., van der Haas, V., Lustenhouwer, W., Reijmer, J. J. G. and Roebroeks, W. (2014) '*Homo erectus* at Trinil on Java used shells for tool production and engraving' in *Nature*, doi 10.1038

Jordan, P. (2003a) *Material Culture and Sacred Landscape: The Anthropology of the Siberian Khanty*. USA: Altamira Press.

Jordan, P. (2003b) 'Investigating Post-Glacial Hunter Gatherer Landscape Enculturation: Ethnographic Analogy and Interpretive Methodologies' in H. Kindgren, K. Knutsson, D. Loeffler and A. Åkerlund (Eds.) *Mesolithic on the Move. Papers Presented at the Sixth International Conference on the Mesolithic on Europe, Stockholm 2000*, pp. 128-138. Oxford: Oxbow Books.

Jordan, P. (2008) 'Hunters and gatherers' in A. R. Bentley (Ed.) *Handbook of Archaeological Theories*, pp. 447-465. Plymouth: AltaMira Press.

Kaagan, L. M., Bahn, P. G. and Lister, A. M. (2011) 'Discovery of a horse engraving from Bruniquel, France' in *Antiquity*, Vol. 85, No. 330, <http://antiquity.ac.uk/projgall/kaagan330/>

Kaare, B. and Woodburn, J. (2006) 'The Hadza of Tanzania' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 200-204. Cambridge: Cambridge University Press.

- Kato, M. and Mugitani, R. (2015) 'Pareidolia in Infants' in *PLoS ONE*, Vol. 10, No. 2, e0118539.
- Keeley, L. H. (2010) 'The Probable Sexual Division of labor in Magdalenian Hide Working: Ethnological Evidence' in E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pp. 227-234. USA: State University of New York Press.
- Keen, I. (2006) 'Yolngu of northeast Arnhem Land' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 367-371. Cambridge: Cambridge University Press.
- Kehoe, A. B. (2006) 'Blackfoot and other hunters of the North American Plains' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 36-40. Cambridge: Cambridge University Press.
- Kelly, R. C. (2005) 'The evolution of lethal intergroup violence' in *Proceedings of the National Academy of Sciences*, Vol. 102, No. 43, pp. 15294-15298.
- Kelly, R. L. (2013) *The Lifeways of Hunter-Gatherers: The Foraging Spectrum*. Cambridge: Cambridge University Press.
- Kelly, R. L. and Poyer L. (2006) 'The Mikea of Madagacar' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 215-219. Cambridge: Cambridge University Press.
- Keyser, J. D. and Whitley, D. S. (2006) 'Sympathetic Magic in Western North American Rock Art' in *American Antiquity*, Vol. 71, No. 1, pp. 3-26.
- Kierdorf, U., Li, C. and Price, J. S. (2009) 'Improbable appendages: Deer antler renewal as a unique case of mammalian regeneration' in *Seminars in Cell Development Biology*, Vol. 20, pp. 535-542.
- Kilgore, C. and Gonthier, E. (2014) 'Premières découvertes sur les techniques de fabrication de cordages à partir de rouets (Bâtons-percés). Évidences sur le mobilier et l'art pariétal du Paléolithique supérieur (Magdalénien)' in *L'anthropologie*, Vol. 118, pp. 347-381.
- Kind, C.-J., Ebinger-Rist, N., Wolk, S., Beutelspacher, T., and Wehberger, K. (2014) 'The Smile of the Lion Man. Recent Excavations in Stadel Cave (Baden-Württemberg, southwestern Germany) and the Restoration of the Famous Upper Palaeolithic Figurine' in *Quartär*, Vol. 61, pp. 129-145.

- Kirk, T. (2006) 'Materiality, Personhood, and Monumentality in Early Neolithic Britain' in *Cambridge Archaeological Journal*, Vol. 16, No. 3, pp. 333-347.
- Klein, R. G. (2009) *The Human Career: Human Biological and Cultural Origins*. Chicago: Chicago University Press.
- Klíma, B. (1954) 'Palaeolithic huts at Dolní Věstonice, Czechoslovakia' in *Antiquity*, Vol. 28, No. 109, pp. 4-14.
- Klíma, B. (1958) 'Recent Discoveries of Upper Palaeolithic Art in Moravia' in *Antiquity*, Vol. 32, No. 125, pp. 8-17.
- Knapp, S. (2007) 'Alfred Russel Wallace: The Problem of the Origin of Species' in R. Huxley (Ed.) *The Great Naturalists*, pp. 277-285. UK: Thames and Hudson.
- Knappett, C. (2002) 'photographs, Skeumorphs and Marionettes: Some Thoughts on Mind, Agency and Object' in *Journal of Material Culture*, Vol. 7, pp. 97-117.
- Knappett, C. (2004) 'The Affordance of Things: a Post-Gibsonian Perspective on the Relationality of Mind and Matter' in E. DeMarrais, C. Gosden and C. Renfrew (Eds.) *Rethinking Materiality: the engagement of mind with the material world*, pp. 43-51. Cambridge: Oxbow Books.
- Knappett, C. (2006) 'Beyond Skin: Layering and Networking in Art and Archaeology' in *Cambridge Archaeological Journal*, Vol. 16, No. 2, pp. 239-251.
- Kopytoff, I. (1986) 'The Cultural biography of things; Commoditization as process' in A. Appadurai (Ed.) *The Social Life of Things: Commodities in Cultural Perspective*, pp. 64-91. Cambridge: Cambridge University Press.
- Kratz, C. A. (2006) 'The Okiek of Kenya' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 220-224. Cambridge: Cambridge University Press.
- Krause, J., Fu, Q., Good, J. M., Viola, B., Shunkov, M. V., Derevianko, A. P., Pääbo, S. (2010) 'The complete mitochondrial DNA genome of an unknown hominin from southern Siberia', *Nature*, Vol. 464, pp. 894-897.

Kuntz, D. and Costamagno, S. (2011) 'Relationships between reindeer and man in southwestern France during the Magdalenian' in *Quaternary International*, Vol. 238, pp. 12-24.

Ladier, E. (2012) 'Documents inédits sur l'abri Montastruc à Bruniquel (Tarn-et-Garonne, France)' in *Bulletin Préhistorique du Sud-Ouest*, Vol. 20, pp. 179-199.

Ladier, E., Welté, A.-C. and Lambert, G. (1994) 'Les objets de parure de la vallée de l'Aveyron. Le Courbet, Bruniquel-Montastruc et autres abris; documents inédits ou retrouvés' in *Paleo*, Vol. 6, pp. 197-231.

La Fontaine, J. S. (1996) 'Person and Individual: some anthropological reflections' in M. Carrithers, S. Collins and M. Lukes (Eds.) *The Category of the Person: Anthropology, Philosophy, History*, pg. 123-240. Cambridge: Cambridge University Press.

Lahr, M. M., Rivera, F., Power, R. K., Mounier, A., Copsey, B., Crivellaro, F., Edung, J. E., Maillo Fernandez, J. M., Kiarie, C., Leakey, A., Mbuja, E., Miller, H., Muigai, A., Mukhongo, D. M., Van Baelen, A., Wood, R., Schwenninger, J.-L., Grün, R., Achyuthan, H., Wilshaw, A. and Foley, R. A. (2016) 'Inter-group violence among early Holocene hunter-gatherers of West Turkana, Kenya' in *Nature*, Vol. 529, pp. 394-398.

Lane, P. J. (2014) 'Hunter-Gatherer-Fishers, Ethnoarchaeology, Analogical Reasoning' in V. Cummings, P. Jordan and M. Zvelevbil (Ed.) *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*, DOI: 10.1093/oxfordhb/9780199551224.013.024

Langlais, M. (2011) 'Processes of change in Magdalenian societies in the Pyrenean isthmus (20-16 ky cal BP)' in *Antiquity*, Vol. 85, pp. 715-728.

Langlais, M., Costamagno, S., Laroulandie, V., Pétilion, J.-M., Discamps, E., Mallye, J.-B., Cochard, D. and Kuntz, D. (2012) 'The evolution of Magdalenian societies in South-West France between 18,000 and 14,000 cal BP: Changing environments, changing tool kits' in *Quaternary International*, Vol. 272-273, pp. 138-149.

Langlais, M., Ladier, E., Chalard, P., Jarry, M., Lacrampe-Cuyaubère, F. (2007) 'Aux origines du Magdalénien classique: les industries de la séquence inférieure de l'Abri Gandil (Bruniquel, Tarn-et-Garonne)' in *Paleo*, Vol. 19, <http://paleo.revues.org/687>

Langley, M., Augier, D., Delage, C. and Pauthier, A. (2014) 'A Magdalenian decorated *baguette demi-ronde* from Grotte de l'Abbé (Charente, France)' in *Comptes Rendus Palevol*, Vol. 14, No. 4, pp. 321-330.

Langley, M. C. (2014) 'Magdalenian antler projectile point design: Determining original form for uni- and bilaterally barbed points' in *Journal of Archaeological Science*, Vol. 44, pp. 104-116.

Langley, M. C. and Street, M. (2013) 'Long range inland-coastal networks during the Late Magdalenian: Evidence for individual acquisition of marine resources at Andernach-Martinsberg, German Central Rhineland' in *Journal of Human Evolution*, Vol. 64, pp. 457-465.

Langley, M. C., Clarkson, C. and Ulm, S. (2008) 'Behavioral Complexity in Eurasian Neanderthal Populations: a Chronological Examination of the Archaeological Evidence' in *Cambridge Archaeological Journal*, Vol. 18, No. 3, pp. 289-507.

Laroulandie, V. (2004) 'Bird exploitation pattern: the case of Ptarmigan *Legopus* sp. In the Upper Magdalenian site of La Vache (Ariège, France)' in G. Grupe, J. Peters (Eds.) *Feathers, grit and symbolism. Birds and humans in the ancient Old and New Worlds. Proceedings of the 5th Meeting of the ICAZ Bird Working Group, Munich, 26-28 July 2004. (Documenta Archaeobiologiae 3). Rahden Germany*, pp. 165-178.

Lartet, E. and Christy, H. (1875) *Reliquae Aquitanae: Being Contributions to The Archæology and Palæontology of Perigord and the Adjoining Provinces of southern France*. Edinburgh: Williams and Norgate.

Latour, B. (1993) *We have never been modern*. Cambridge: Harvard University Press.

Layton, R. (1987) 'Comment' in *Current Anthropology*, Vol. 28, No. 1, pp. 79.

Layton, R. (1988) 'Comment' in *Current Anthropology*, Vol. 29, No. 2, pp. 226-227.

Layton, R. (2001) 'Hunter-gatherers, their neighbours and the Nation State' in C. Panter-Brick, R. H. Layton and P. Rowley-Conwy (Eds.) *Hunter-Gatherers: An Interdisciplinary Perspective*, pg. 292-321. Cambridge: Cambridge University Press.

Leavesley, M. G. (2007) 'A shark-tooth ornament from Pleistocene Sahul' in *Antiquity*, Vol. 81, No. 312, pp. 308-315.

Lee, E. J., Merriwether, D. A., Kasparov, A. K., Nikolskiy, P. A., Sotnikova, M. V., Pavlova, E. Y., and Pitulko, V. V. (2015) 'Ancient DNA Analysis of the Oldest Canid Species from the Siberian Arctic and Genetic Contribution to the Domestic Dog' in *PLoS One*, DOI: 10.1371/journal.pone.0125759

Lee, R. B. and Daly, R. (2006) *The Cambridge Encyclopedia of Hunters and Gatherers*. Cambridge: Cambridge University Press.

Leeb, S. (2015) 'Primitivism and humanist teleology in art history around 1900' in *Journal of Art Historiography*, Vol. 12, pp. 1-15.

Leesch, D., Bullinger, J., Cattin, M.-I., Müller, W. and Plumettaz, N. (2010) 'Hearths and Hearth-Related Activities in Magdalenian Open-Air Sites: The Case of Champréveyres and Monruz (Switzerland) and their Relevance to an Understanding of Upper Paleolithic Site Structure' in M. Połtowicz-Bobak and D. Bobak (Eds.) *The Magdalenian in Central Europe. New Finds and Concepts*, pg. 53-69. Rzeszów: Fundacja Rzeszowskiego Ośrodka Archeologicznego.

Leesch, D., Müller, W., Nielsen, E., and Bullinger, J. (2012) 'The Magdalenian in Switzerland: Re-colonization of a newly accessible landscape' in *Quaternary International*, Vol. 272-273, pp. 191-208.

Lefebvre, A., Rochefort, G. Y., Santos, F., Le Denmat, D., Salmon, B. and Pétillon, J.-M. (2016) 'A Non-Destructive Method for Distinguishing Reindeer Antler (*Rangifer tarandus*) from Red Deer Antler (*Cervus elaphus*) Using X-Ray Micro-Tomography Coupled with SVM Classifiers' in *PLoS ONE*, Vol. 11, No. 2, e0149658.

Le Quellec, J.-L., Duquesnoy, F. and Defrasne, C. (2015) 'Digital image enhancement with *DStretch*®: Is complexity always necessary for efficiency?' in *Digital Applications in Archaeology and Cultural Heritage*, Vol. 2, pp. 55-67.

Lerma, J. L., Navarro, S., Cabrellas, M. and Villaverde, V. (2010) 'Terrestrial laser scanning and close range photogrammetry for 3D archaeological documentation: the Upper Palaeolithic Cave of Papalló as a case study' in *Journal of Archaeological Science*, Vol. 37, pp. 499-507.

Lerma, J. L., Villaverde, V. García, A. and Cardona, J. (2006) 'Close Range Photogrammetry and Enhancement Recording of Palaeolithic Rock Art' in *IARPS*, Vol. XXXVI, pp. 147-153.

Leroi-Gourhan, A. (1964) *Les Religions de la Préhistoire*. Paris: Presses Universitaires de France.

Leroi-Gourhan, A. (1982) *The Dawn of European Art: An Introduction to Palaeolithic Cave painting*. Cambridge: Cambridge University Press.

Lewis-Williams, D. (1987) 'Comment' in *Current Anthropology*, Vol. 28, No. 1, pp. 79-80.

Lewis-Williams, J. D. (1995a) 'Seeing and Construing: The making and 'Meaning' of a Southern African Rock Art Motif' in *Cambridge Archaeological Journal*, Vol. 5, No. 1, pp. 3-23.

Lewis-Williams, J. D. (1995b) 'Modelling the Production and Consumption of Rock Art' in *The South African Archaeological Bulletin*, Vol. 50, No. 162, pp. 143-154.

Lewis-Williams, J. D. (1999) "'Meaning' in Southern African Rock Art: Another Impasse?" in *The South African Archaeological Bulletin*, Vol. 54, No. 170, pp. 141-145.

Lewis-Williams, D. (2002) *The Mind in the Cave: Consciousness and the Origins of Art*. UK: Thames and Hudson.

Lewis-Williams, J. D. (2003) 'Putting the record straight: Rock art and shamanism' in *Antiquity*, Vol. 77, No. 295, pp. 165-170.

Lewis-Williams, J. D. (2004) 'Neuropsychology and Upper Palaeolithic Art: Observations on the Progress of Altered States of Consciousness' in *Cambridge Archaeological Journal*, Vol. 14, No. 1, pp. 107-111.

Lewis-Williams, J. D. (2005) 'The southern African San and their rock art' in *Transactions of the Royal Society of South Africa*, Vol. 60, No. 2, pp. 139-146.

Lewis-Williams, J. D. (2014) 'Art for the Living' in V. Cummings, P. Jordan and M. Zvelebil (Eds.) *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*, DOI 10.1093/oxfordhb/9780199551224.013.006

Lewis-Williams, J. D. and Clottes, J. (1998) 'The Mind in the Cave – the Cave in the Mind: Altered Consciousness in the Upper Paleolithic' in *Anthropology of Consciousness*, Vol. 9, No. 1, pp. 13-21.

Lewis-Williams, J. D. and Dowson, T. A. (1990) 'On Palaeolithic Art and the Neuropsychological Model' in *Current Anthropology*, Vol. 31, No. 4, pp. 407-408.

Lewis-Williams, J. D., Dowson, T. A., Bahn, P. G., Bandi, H.-G., Bednarik, R. G., Clegg, J., Consens, M., Davis, W., Delluc, B., Delluc, G., Faulstich, P., Halverson, J., Layton, R., Martindale, C., Mirimanov, V., Turner II, C. G., Vastokas, J. M., Winkelman, M., and Wylie, A. (1988) 'The Signs of All Times: Entoptic Phenomena in Upper Palaeolithic Art [and Comments and Reply]' in *Current Anthropology*, Vol. 29, No. 2, pp. 201-245.

Lewis-Williams, J. D. and Pearce, D. G. (2012) 'The southern San and the trance dance: a pivotal debate in the interpretation of San rock paintings' in *Antiquity*, Vol. 86, No. 333, pp. 696-706.

Libby, W. F. (1967) 'History of Radiocarbon Dating' in *Radioactive Dating Methods and Low Level Counting* pp. 3-25. Vienna: International Atomic Energy Agency.

LiPuma, E. (1998) 'Modernity and forms of personhood In Melanesia' in M. Lambek and A. Strathern (Eds.) *Bodies and persons: Comparartive perspectives from Africa and Melanesia*, pp. 53-79. Cambridge: Cambridge University Press.

Liu, J., Li, J., Feng, L., Li, L., Tian, J. and Lee, K. (2014) 'Seeing Jesus in toast: Neural and behavioural correlates of face pareidolia' in *Cortex*, Vol. 53, pp. 60-77.

Lloyd, A. S., Martin, J. E., Bornett-Gauci, H. L. I. and Wilkinson, R. G. (2008) 'Horse personality: Variation between breeds' in *Applied Animal Behaviour Science*, Vol. 112, pp. 369-383.

Lombard, M. (2007) 'The gripping nature of ochre: The association of ochre with Howiesons Poort adhesives and Late Stone Age mastics from South Africa' in *Journal of Human Evolution*, Vol. 53, pp. 406-419.

Lombard, M. (2008) 'Finding resolution for the Howiesons Poort through the microscope: micro-residue analysis of segments from Sibudu Cave, South Africa' in *Journal of Archaeological Science*, pp. 26-41.

Lombard, M. and Phillipson, L. (2010) 'Indications of bow and stone-tipped arrow use 64 000 years ago in KwaZulu-Natal, South Africa' in *Antiquity*, Vol. 84, No. 325, pp. 635-648.

Lorblanchet, M. and Sieveking, A. (1997) 'The monsters of Pergouset' in *Cambridge Archaeological Journal*, Vol. 7, No. 1, pp. 37-56.

Losey, R. J., Bazaliiskii, V. I., Garvie-Lok, S., Germonpré, M., Leonard, J. A., Allen, A. L., Katzenberg, M. A. and Sablin, M. V. (2011) 'Canids as persons: Early Neolithic dog and wolf burials, Cis-Baikal, Siberia' in *Journal of Anthropological Archaeology*, Vol. 30, pp. 174-189.

Losey, R. J., Bazaliiskii, V. I., Lieverse, A. R., Waters-Rist, A., Faccia, K. and Weber, A. W. (2013) 'The bear-able likeness of being: ursine remains at the Shamanka II cemetery, Lake Baikal, Siberia' in C. Watts (Ed.) *Relational Archaeologies: Humans, Animals, Things*, pp. 65-96. London and New York: Routledge.

Lott, D. F. (2003) *American Bison: A Natural History*. Berkeley: University of California Press.

Lubbock, (1865) *Prehistoric Times: as illustrated by ancient remains, and the manners and customs of modern savages*. London: Williams and Norgate.

Mackay, A. and Welz, A. (2008) 'Engraved ochre from a middle Stone Age context at Klein Kliphuis in the Western Cape of South Africa' in *Journal of Archaeological Science*, Vol. 35, pp. 1521-1532.

Magnani, M. (2014) 'Three-Dimensional Alternatives to Lithic Illustration' in *Advances in Archaeological Practice*, Vol. 2, No. 4, pp. 285-297.

Mailhot, J. (2006) 'The Innu of Quebec and Labrador' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 51-55. Cambridge: Cambridge University Press.

Malafouris, L. (2004) 'The cognitive Basis of material Engagement: Where Brain, body and Culture Conflate' in E. DeMarras, C. Gosden and C. Renfrew (Eds.) *Rethinking materiality: the engagement of mind with material world*, pp. 53-62. Cambridge: Oxbow Books.

Malafouris, L. (2007) 'Before and beyond Representation: Towards an Enactive Conception of the Palaeolithic Image' in C. Renfrew and I. Morley (Eds.) *Image and Imagination: a global prehistory of figurative representation*, pp. 287-300. Cambridge: Oxbow Books.

Malafouris, L. (2008a) 'Beads for a Plastic Mind: the 'Blind Man's Stick' (BMS) Hypothesis and the Active Nature of Material Culture' in *Cambridge Archaeological Journal*, Vol. 18, No. 3, pp. 401-414.

Malafouris, L. (2008b) 'Between brain, bodies and things: *tectonoetic* awareness and the extended self' in *Philosophical Transactions of the Royal Society B*, Vol. 363, pp. 1993-2002.

Malafouris, L. (2010) 'Metaplasticity and the human becoming: principles of neuroarchaeology' in *Journal of Anthropological Sciences*, Vol. 88, pp. 49-72.

Malzbender, T., Gelb, D., Wolters, H. and Zuckerman, B. (2004) 'Enhancement of Shape Perception by Surface Reflectance Transformation' in G. Girod, M. Magnor and H.P. Seidel (Eds.) *Vision, Modeling, and Visualization 2004: Proceedings, November 16-18, 2004, USA*: Stanford, 183, pp. 1-3. USA: IOS Press.

Malzbender, T., Wilburn, B., Gelb, D. and Ambrisco, B. (2006) 'Surface Enhancement Using Real-time Photometric Stereo and Reflectance Transformation' in T. Akenine-Möller and W. Heidrich (Eds.) *EGSR '06 Proceedings of the 17th Eurographics conference on Rendering Techniques, Nicosia, Cyprus — June 26 - 28, 2006*, pp. 245-250. Switzerland: Eurographics Association.

Mania, D. and Mania, U. (1988) 'Deliberate Engravings on Bone Artefacts of Homo Erectus' in *Rock Art Research*, Vol. 5, No. 2, pp. 91-107.

Mantler, M. and Schreiner, M. (2000) 'X-Ray Fluorescence Spectrometry in Art and Archaeology' in *X-Ray Spectroscopy*, Vol. 29, pp. 3-17.

Markus, H. R. and Kitayama, S. (1991) 'Culture and Self: Implications for Cognition, Emotion and Motivation' in *Psychological Review*, Vol. 98, No. 2, pp. 224-253.

Marshack, A. (1971) 'Upper Palaeolithic engraved pieces in the British Museum' in G. de G. Sieveking (Ed.) *Prehistoric and Roman Studies. Commemorating the opening of the department of prehistoric and romano-british antiquities*, pp. 137-145. London: British Museum Publications.

Marshack, A. (1972) 'Cognitive Aspects of Upper Paleolithic Engraving' in *Current Anthropology*, Vol. 14, No. 3, pp. 445-477.

Marshack, A. (1991) 'The Female Image: A 'Time-Factored' Symbol. A Study in Style and Aspects of Image Use in the Upper Paleolithic' in *Proceedings of the Prehistoric Society*, Vol. 57, No. 1, pp. 17-31.

Marshack, A. (1996) 'A Middle Paleolithic Symbolic Composition From the Golan Heights: The Earliest Known Depictive Image' in *Current Anthropology*, Vol. 37, No. 2, pp. 357-365.

Marshack, A. (1997) 'The Berekhat Ram figurine: a late Acheulian carving from the Middle East' in *Antiquity*, Vol. 71, No. 272, pp. 327-337.

- Martin, D. F. (2006) 'Cape York people, north Queensland, Australia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 335-338. Cambridge: Cambridge University Press.
- Marquet, J.-C. and Lorblanchet, M. (2003) 'A Neanderthal face? The proto-figurine from La Roche-Cotard, Langeais (Indre-et-Loire, France)' in *Antiquity*, Vol. 77, No. 298, pp. 661-670.
- Masson, J. (2006) 'Apollo 11 Cave in Southwest Namibia: Some Observations on the Site and Its Rock Art' in *The South African Archaeological Bulletin*, Vol. 61, No. 183, pp. 76-89.
- Mauss, M. (2006) [1923] *The gift: The form and reason for exchange in archaic societies*. London: Routledge.
- Mauss, M. (1996) 'A category of the human mind: the notion of the person: the notion of self' in M. Carrithers, S. Collins and M. Lukes (Eds.) *The Category of the Person: Anthropology, Philosophy, History*, pp. 1-25. Cambridge: Cambridge University Press.
- Mazza, P. P. A., Martini, F., Sala, B., Magi, M., Colombi, M. P., Giachi, G., Landucci, F., Lemorini, C., Modugno, F. and Ribechini, E. (2006) 'A new Palaeolithic discovery: tar-hafted stone tools in a European Mid-Pleistocene bone-bearing bed' in *Journal of Archaeological Science*, Vol. 33, pp. 1310-1318.
- McBrearty, S. (2007) 'Down with the Revolution' in P. Mellars, K. Boyle, O. Bar-Yosef, and C. Stringer (Eds.) *Rethinking the human revolution: new behavioural and biological perspectives on the origin and dispersal of modern humans*, pp. 133-152. Cambridge: McDonald Institute for Archaeological Research.
- McBrearty, S. and Brooks, A. S. (2000) 'The revolution that wasn't: a new interpretation of the origins of modern human behaviour' in *Journal of Human Evolution*, Vol. 39, pp. 453-563.
- McDermott, L. (1996) 'Self-Representation in Upper Paleolithic Female Figurines' in *Current Anthropology*, Vol. 37, No. 2, pp. 227-275.
- McNabb, J. (2012) *Dissent with Modification: Human Origins, Palaeolithic Archaeology and Evolutionary Anthropology in Britain 1859-1901*. Oxford: Archaeopress.
- McPherron, S. P., Gernat, T. and Hublin, J.-J. (2009) 'Structured light scanning for high-resolution documentation of *in situ* archaeological finds' in *Journal of Archaeological Science*, Vol. 36, pp. 19-24.

- Meagher, M. (1986) 'Bison bison' in *Mammalian Species*, Vol. 266, pp. 1-8.
- Mednikova, M. B. (2011) 'A Proximal Pedal Phalanx of a Paleolithic Hominin from Denisova Cave, Altai', *Archaeology Ethnology and Anthropology of Eurasia*, Vol. 39, No. 1, pp. 129-138.
- Mednikova, M. B. (2013) 'Distal Phalanx of the Hand of Homo from Denisova Cave Stratum 12: A Tentative Description', *Archaeology Ethnology and Anthropology of Eurasia*, Vol. 41, No. 2, pp. 146-155.
- Mednikova, M. B., Dobrovolskaya, M. V., Viola, B., Lavrenyuk, A. V., Kazansky, P. R., Shklover, V. Y., Shunkov, M. V. and Derevianko, A. P. (2013) 'A Micro Computerized Tomography (X-Ray Microscopy) of the Hand Phalanx of the Denisova Girl', *Archaeology Ethnology and Anthropology of Eurasia*, Vol. 41, No. 3, pp. 120-125.
- Medvedev, G. (1998a) 'Upper Paleolithic Sites in South-Central Siberia' in A. P. Derev'anko, D. B. Shimkin and W. G. Powers (Eds.) *The Paleolithic of Siberia: New Discoveries and Interpretations*, pp. 122-131. Urbana: University of Illinois Press.
- Medvedev, G. (1998b) 'Art from Central Siberian paleolithic Sites' in A. P. Derev'anko, D. B. Shimkin and W. G. Powers (Eds.) *The Paleolithic of Siberia: New Discoveries and Interpretations*, pp. 132-136. Urbana: University of Illinois Press.
- Meiri, M., Lister, A. M., Higham, T. F. G., Stewart, J. R., Straus, L. G., Obermaier, H., González Morales, M. R., Marí-Arroyo, A. B. and Barnes, I. (2013) 'Late-glacial recolonization and phylogeography of European red deer (*cervus elaphus* L.)' in *Molecular Ecology*, Vol. 22, pp. 4711-4722.
- Mellars, P. (2005) 'The Impossible Coincidence' in *Evolutionary Anthropology*, Vol. 14, pp. 12-27.
- Melnycky, N. A., Weladji, R. B., Holand, Ø., Nieminen, M. (2013) 'Scaling of antler size in reindeer (*Rangifer tarandus*): sexual dimorphism and variability in resource allocation' in *Journal of Mammalogy*, Vol. 94, No. 6, pp. 1371-1379.
- Mercader, J., Barton, H., Gillespie, J., Harris, J., Kuhn, S., Tyler, R. and Boesch, C. (2007) '4,300-year-old chimpanzee sites and the origins of percussive stone technology' in *Proceeding of the National Academy of Sciences*, Vol. 104, No. 9, pp. 3043-3048.

- Mercader, J., Panger, M. and Boesch, C., (2002) 'Excavation of a Chimpanzee Stone Tool Site in the African Rainforest' in *Science*, Vol. 296, No. 5572, pp. 1452-1455.
- Meskell, L. (2005) 'Introduction: Object Orientations' in L. Meskell (Ed.) *Archaeologies of Materiality*, pp. 1-17. UK: Blackwell.
- Mevel, L. (2013) 'Magdalenian pioneers in the northern French Alps, 17 000 cal BP' in *Antiquity*, Vol. 87, pp. 384-404.
- Miller, D. (2001) 'Behind Closed Doors' in D. Miller (Ed.) *Home Possessions: Material Culture Behind Closed Doors*, pp. 1-19. Oxford: Berg.
- Miller, D. (2005a) 'Afterword' in L. Meskell (Ed.) *Archaeologies of Materiality*, pp. 212-219. UK: Blackwell.
- Miller, D. (2005b) 'Introduction' in D. Miller (Ed.) *Materiality*, pp. 1-50. USA: Duke University Press.
- Miller, D. (2005) *Materiality*. USA: Duke University Press.
- Miller, D. (2012a) *The Comfort of Things*. UK: Polity press.
- Miller, D. (2012b) *Stuff*. UK: Polity Press.
- Miller, R. (2012) 'Mapping the expansion of the Northwest Magdalenian' in *Quaternary International*, Vol. 272-273, pp. 209-230.
- Miller, R., Noiret, P. (2009) 'Recent results for the Belgian Magdalenian' in M. Street, N. Barton and T. Terberger (Eds.) in *Humans Environment and Chronology of the Late Glacial of the North European Plain*, pp. 39-53. Germany: Römisch-Germanisches Zentralmuseum.
- Milner, N., Bamforth, M., Beale, G., Carty, J., Chatzipanagis, K., Croft, S., Conneller, C., Elliott, B., Fitton, L., Knight, B., Kröger, R., Little, A., Needham, A., Panter, I., Robson, H., Rowley, R. and Taylor, B. (2016) 'A unique, engraved pendant from the Early Mesolithic site of Star Carr, UK' in *Internet archaeology*, Vol. 40, <http://dx.doi.org/10.11141/ia.40.8>
- Mithen, S. (1988a) 'Looking and Learning: Upper Palaeolithic Art and Information Gathering' in *World Archaeology*, Vol. 19, No. 3, pp. 297-327.
- Mithen, S. J. (1988b) 'To Hunt or to Paint: Animals and Art in the Upper Palaeolithic' in *Man*, New Series, Vol. 23, No. 4, pp. 671-695.

Mithen, S. (2005) 'Archaeometry and Materiality: Materials-Based Analysis in Theory and Practice', *Archaeometry*, 46(3), 327-338, 2004, and Reply. Comments V: The Need for an Evolutionary Perspective on the Human Mind' in *Archaeometry*, Vol. 47, No. 1, pp. 189-192.

Mithen, S. (2006) *The Singing Neanderthals: The origins of music, language, mind and body*. Great Britain: Phoenix.

Mithen, S., Wicks, K., Pirie, A., Riede, F. Lane, C., Banerjea, R., Cullen, V., Gittins, M. and Pankhurst, N. (2015) A Lateglacial archaeological site in the far north-west of Europe at Rubha an t-Seilich, Isle of Islay, western Scotland: Ahrensburgian-style artefacts, absolute dating and geochronology' in *Journal of Quaternary Science*, Vol. 30, No. 5, pp. 396-416.

Mons, L., Péan, S. and Pigeaud, R. (2013) *Matières d'art: représentations préhistoriques et supports osseux, relations et constraints*. France: éditions errance.

Morey, D. F. (2006) 'Burying key evidence: the social bond between dogs and people' in *Journal of Archaeological Science*, Vol. 33, pp. 158-175.

Morey, D. F. and Jeger, R. (2015) 'Paleolithic dogs: Why sustained domestication then?' in *Journal of Archaeological Science*, Vol. 3, pp. 420-428.

Morley, I. (2002) 'Evolution of the Physiological and Neurological Capacities for Music' in *Cambridge Archaeological Journal*, Vol. 12, No. 2, pp. 195-216.

Morley, I. (2006) *The Evolutionary Origins and Archaeology of Music*. Unpublished PhD Thesis, University of Cambridge.

Morley, I. (2007) 'New Question of Old Hands: Outlines of Human Representation in the Palaeolithic' in C. Renfrew and I. Morley (Eds.) *Image and Imagination: a global prehistory of figurative representation*, pp. 69-82. Cambridge: Oxbow Books.

Morin, E. and Laroulandie, V. (2012) 'Presumed Symbolic Use of Diurnal Raptors by Neanderthals' in *PLoS ONE*, Vol. 7, No. 3, e32856.

Moro Abadía, O. (2006) 'Art, crafts and Paleolithic art' in *Journal of Social Archaeology*, Vol. 6, pp. 119-141.

Moro Abadía, O. and González Morales, M. R. (2004) 'Towards a Genealogy of "Palaeolithic Mobiliary Art"' in *Journal of Anthropological Research*, Vol. 60, No. 3, pp. 321-339.

- Moro-Abadía, O. and González Morales, M. R. (2007) 'Thinking about 'Style' in the 'post-Stylistic Era': Reconstructing the Stylistic Context of Chauvet' in *Oxford Journal of Archaeology*, Vol. 26, No. 2, pp. 109-125.
- Moro-Abadía, O. and González-Morales, M. R. (2008) 'Paleolithic Art Studies at the Beginning of the Twenty-First Century: A Loss of Innocence' in *Journal of Anthropological Research*, Vol. 64, No. 4, pp. 529-552.
- Moro Abadía, O. and González Morales, M. R. (2010) 'Redefining Neanderthals and Art: An Alternative Interpretation of the Multiple Species Model for the Origin of Behavioural Modernity' in *Oxford Journal of Archaeology*, Vol. 29, No. 3, pp. 229-243.
- Moro Abadía, O. and González Morales, M. R. (2013) 'Paleolithic Art: A Cultural History' in *Journal of Archaeological Research*, Vol. 21, pp. 269-306.
- Moro Abadía, O. and Palacio-Pérez, E. (2015) Rethinking the Structural Analysis of Palaeolithic Art: New Perspectives on Leroi-Gourhan's Structuralism' in *Cambridge Archaeological Journal*, Vol. 25, No. 3, pp. 657-672.
- Moro Abadía, O. (2015) The reception of Palaeolithic art at the turn of the twentieth century: Between archaeology and art history' in *Journal of Art Historiography*, Vol. 12, pp. 1-23.
- Moro Abadía, O. and Pelayo, F. (2010) 'Reflections on the concept of 'precursor': Juan de Vilanova and the discovery of Altamira' in *History of Human Sciences*, Vol. 23, No. 4, pp. 1-20.
- Moro Abadía, O. (2015) 'The reception of Palaeolithic art at the turn of the twentieth century: between archaeology and art history' in *Journal of Art Historiography*, Vol. 12, pp. 1-23.
- Morris, B. (2006) 'The Hill Pandaram of Kerala' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 265-268. Cambridge: Cambridge University Press.
- Morse, K. (1993) 'Shell beads from Mandu Mandu Creek rock-shelter, Cape Range Peninsula, Western Australia, dated before 30,000 b.p.' in *Antiquity*, Vol. 67, No. 257, pp. 877-883.

Morse, M. A. (1999) 'Craniology and the Adoption of the Three-Age System in Britain' in *Proceedings of the Prehistoric Society*, Vol. 65, pp. 1-16.

Mortensen, M. F., Olsen, J., Holm, J. and Christensen, C. (2014) 'Right time, right place – dating the Havelte phase in Slotseng, Denmark' in F. Riede and M. Tallaavaara (Eds.) *Lateglacial and Postglacial Pioneers in Northern Europe. British Archaeological Reports International Series 2559*, pp. 11-22. Oxford: Archaeopress.

Morton, J. (2006) 'The Arrerente of Central Australia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 329-334. Cambridge: Cambridge University Press.

Moser, S. (1992) 'The visual language of archaeology: a case of the Neanderthals' in *Antiquity*, Vol. 66, No. 253, pp. 831-844.

Moser, S. (2001) 'Archaeological Representation: The Visual Conventions for Constructing Knowledge about the Past' in I. Hodder (Ed.) *Archaeological Theory Today*, pp. 262-283. Cambridge: Polity Press.

Mosko, M. S. (2000) 'Inalienable Ethnography: Keeping-While-Giving and the Trobriand Case' in *Journal of the Royal Anthropological Institute*, Vol. 6, pp. 377-396.

Mudge, M., Malzbender, T., Schroer, C. and Lum, M. (2006) 'New Reflection Transformation Imaging Methods for Rock Art and Multiple-Viewpoint Display' in M. Ioannides, D. Arnold, F. Niccolucci, and K. Mania (Eds.) *The 7th International Symposium on Virtual Reality, Archaeology and Cultural Heritage*, pp. 195-202. Switzerland: The Eurographics Association.

Mudge, M., Malzbender, T., Chalmers, A., Scopigno, R., Davis, J., Wang, O., Gunawardane, P., Ashley, M., Doerr, M., Proenca, A. and Barbosa, J. (2008) 'Image-Based Empirical Information Acquisition, Scientific Reliability, and Long-Term Digital Preservation for the Natural Sciences and Cultural Heritage' in M. Roussou and J. Leigh (Eds) *Eurographics 2008 – Tutorials*, <http://dx.doi.org/10.2312/egt.20081050>.

Mudge, M., Schroer, C., Earl, G., Martinez, K., Pagi H., Toler-Franklin, C., Rusinkiewicz, S., Palma, G., Wachowiak, M., Ashley, M., Matthews, N., Noble, T. and Dellepiane, M. (2010) 'Principles and Practices of Robust, Photography-based Digital Imaging Techniques for Museums' in A. Artusi, M. Joly-Parveaux, G. Lucet, A. Ribes and D. Pitzalis (Eds.) *The 11th*

International Symposium on Virtual Reality, Archaeology and Culture Heritage VAST, pp. 111-137. Switzerland: Eurographics Association.

Mullan, G. J., Wilson, L. J., Farrant, A. R. and Devlin, K. (2006) 'A Possible Engraving of a Mammoth in Gough's Cave, Cheddar, Somerset' in *Proceedings of the University of Bristol Spelaeological Society*, Vol. 24, No. 1, pp. 37-47.

Mulvaney, K. (2013) 'Iconic imagery: Pleistocene rock art development across northern Australia' in *Quaternary International*, Vol. 285, pp. 99-110.

Murray, M. A. (1934) 'Female Fertility Figures' in *The Journal of the Royal Anthropological Institute of Great Britain and Ireland*, Vol. 64, pp. 93-100.

Murray, D. W. (1993) 'What is the Western Concept of the Self? On Forgetting David Hume' in *Ethos*, Vol. 21, No. 1, pp. 3-23.

Mussi, M. (2015) 'Encoding and decoding the message: The cave of mid Upper Palaeolithic female imagery' in F. S. Coward, R. Hosfield, M. Pope and F. F. Wenban-Smith (Eds.) *Settlement, Society and Cognition in Human Evolution: Landscapes in the Mind*, pg. 275-287. Cambridge: Cambridge University Press.

Myers, F. R. (2006) 'Pintupi-speaking Aboriginals of the Western Desert' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pg. 348-352. Cambridge: Cambridge University Press.

Nadasdy, P. (2007) 'The Gift of the Animal: The Ontology of Hunting and Human-Animal Sociality' in *American Ethnologist*, Vol. 34, No. 1, pp. 25-43.

Needham, A. P. (2010) '*Venuses*' beyond the Visual: A Reinterpretation of Palaeolithic '*Venus*' Figurines'. Thesis submitted for the degree of MSc Early Prehistory, University of York.

Needham, A. P., Rowley, C. C. A., Croft, S., Taylor, B., Gray Jones, A., Conneller, C. and Kröger, R. (in review) 'Scratching the Surface of Ochre Working in the British Mesolithic: Analysis of an Anthropogenically Modified Ochre Pebble from Flixton School House Farm', submitted to *Journal of Archaeological Science: Reports*.

Needham, A. P. Little, A., Conneller, C., Pomstra, D., Croft, S. and Milner, N. (in review) 'Beads and Pendant' in N. Milner, C. Conneller and B. Taylor (Eds.) *Star Carr Monograph: Vol. 2.*, pp. xx-xx. University of York: White Rose Press. [open access]

- Nelson, S. M. (1990) 'Diversity in Upper Palaeolithic "Venus" Figurines and Archeological Mythology' in *Archeological Papers of the American Anthropological Association*, Vol. 2, No. 1, pp. 11-22.
- Nemysova, E. A. (2006) 'The Khanti of the West Siberian Plain' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 161-165. Cambridge: Cambridge University Press.
- Newkirk, P. (2015) *Spectacle: The Astonishing Life of Ota Benga*. USA: Amistad.
- Niven, L., Steele, T. E., Finke, H., Gernat, T., Hublin, J.-J. (2009) 'Virtual skeleton: using a structural light scanner to create a 3D faunal comparative collection' in *Journal of Archaeological Science*, Vol. 36, pp. 2018-2023.
- Norris, L. (2004) 'Shedding Skins: The Materiality of Divestment in India' in *Journal of Material Culture*, Vol. 9, pp. 59-71.
- Nowell, A. (2010) 'Defining Behavioural Modernity in the Context of Neanderthal and Anatomically Modern Human Populations' in *Annual Review of Anthropology*, Vol. 39, pp. 437-452.
- Nowell, A. and Chang, M. L. (2014) 'Science, the Media, and Interpretations of Upper Paleolithic Figurines' in *American Anthropologist*, Vol. 116, No. 3, pp. 562-577.
- Oakley, K. (1965a) 'Folklore of Fossils Part I' in *Antiquity*, Vol. 39, No. 153, pp. 9-16.
- Oakley, K. (1965b) 'Folklore of Fossils Part II' in *Antiquity*, Vol. 39, No. 154, pp. 117-125.
- O'Connor, A. (2007) *Finding Time for the Old Stone Age. A History of Palaeolithic Archaeology and Quaternary Geology in Britian, 1860-1960*. Oxford: Oxford Universtiy Press.
- Olsen, B. (2007) 'Keeping things at arm's length: a genealogy of asymmetry' in *World Archaeology*, Vol. 39, No. 4, pp. 579-588.
- Orschiedt, J. (2002) 'Secondary burial in the Magdalenian: The Brillenhöhle (Blaubeuren, southwest Germany) in *PALEO*, Vol. 14, <http://paleo.revues.org/1504>.
- Orschiedt, J. (2013) 'Bodies, Bits and Pieces: Burials from the Magdalenian and the Late Magdalenian' in A. Pastoors and B. Auffermann (Eds.) *Pleistocene Foragers: Their Culture*

and Environment. Festschrift in Honour of Gerd-Christian Weniger for his Sixtieth Birthday. Wissenschaftliche Schriften des Neanderthal Museums 6, Mettmann 2013, pp. 117-132.

Orton, D. C. (2010) 'Both Subject and Object: Herding, Inalienability and Sentient Property in Prehistory' in *World Archaeology*, Vol. 42, No. 2, pp. 188-200.

Orton, D. C. (2012) 'Taphonomy and Interpretation: An Analytical Framework for Social Zooarchaeology' in *International Journal of Osteoarchaeology*, Vol. 22, pp. 320- 337.

Otte, M. (2012) 'Appearance, expansion and dilution of the Magdalenian civilization' in *Quaternary International*, Vol. 272-273, pp. 354-361.

Overton, N. J. (2014) *Memorable Meetings in the Mesolithic: Tracing the Biography of Human-Nonhuman Relationships in the Kennet and Colne Valleys with Social Zooarchaeology*. Unpublished PhD Thesis, University of Manchester.

Overton, N. J. (2016) 'More than Skin Deep: Reconsidering Isolated Remains of 'Fur Bearing Species' in the British and European Mesolithic' in *Cambridge Archaeological Journal*, Vol. 26, No. 4, pp. 561-578.

Overton, N. J. and Hamilakis, Y. (2013) 'A Manifesto for a Social Zooarchaeology. Swans and Other Beings in the Mesolithic' in *Archaeological Dialogues*, Vol. 20, No. 2, pp. 111-136.

Owen, R. (1863-1864) 'Description of the Cavern of Bruniquel, and Its Organic Contents. Part I. Human Remains' in *Proceedings of the Royal Society of London*, Vol. 13, pp. 276-278.

Owen, R. (1869) 'Description of the Cavern of Bruniquel, and Its Organic Contents. Part II. Equine Remains' in *Philosophical Transactions of the Royal Society of London*, Vol. 159, pp. 535-557.

Paillet, P. (2011) 'le mammoth de la Madeleine (Tursac, Dordogne)' in *Paleo*, Vol. 22, <http://paleo.revues.org/2143>

Paillet, P. and Man-Estier, E. (2011) 'Rediscovery of art pieces from Laugerie-Basse (Dordogne). Collection of Capitaine Maurice Bourlon - *Institut de paleontologie humaine, Paris*' in *L'anthropologie*, Vol. 115, pp. 505-521.

Palacio-Pérez, E. (2010) 'Salomon Reinach and the religious interpretation of Palaeolithic art' in *Antiquity*, Vol. 84, pp. 853-863.

Palacio-Pérez, E. (2013) 'The Origins of the Concept of 'Palaeolithic Art': Theoretical Roots of an Idea' in *Journal of Archaeological Method and Theory*, Vol. 20, pp. 682-714.

Palacio-Pérez, E. and Ruiz Redondo, A. (2014) 'Imaginary creatures in Palaeolithic art: Prehistoric dreams or prehistorians' dreams?' in *Antiquity*, Vol. 88, pp. 259-266.

Pandya, V. (2006) 'The Andaman Islanders of the Bay of Bengal' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 243-247. Cambridge: Cambridge University Press.

Park, R. W. (1998) 'Size counts: the miniature archaeology of childhood in Inuit Societies' in *Antiquity*, Vol. 72, No. 276, pp. 269-281.

Parkington, J. E., Rigaud, J.-Ph., Poggenpoel, C., Porraz, G. and Texier, P.-J. (2013) 'Introduction to the project and excavation of Diepkloof Rock Shelter (Western Cape, South Africa): a view on the Middle Stone Age' in *Journal of Archaeological Science*, Vol. 40, pp. 3369-3375.

Pearce, D. (2004) "'Testing' and Altered States of Consciousness in Upper Palaeolithic Art Research' in *Cambridge Archaeological Journal*, Vol. 14, No. 1, pp. 82-85.

Pelcin, A. (1994) 'A Geological Exploitation for the Berekhat Ram Figurine' in *Current Anthropology*, Vol. 35, No. 5, pp. 674-675.

Peresani, M., Fiore, I., Gala, M., Romandini, M. and Tagliacozzo, A. (2011) 'Late Neanderthals and the intentional removal of feathers as evidenced from bird bone taphonomy at Fumane Cave 44 ky B.P., Italy' in *Proceedings of the National Academy of Sciences*, Vol. 108, No. 10, pp. 3888-3893.

Peresani, M., Vanhaeren, M., Quaggiotto, E., Queffelec, A. and d'Errico, F. (2013) 'An Ochered Fossil Marine Shell From the Mousterian of Fumane Cave, Italy' in *PLoS ONE*, Vol. 8, No. 7, pp. 1-15, e68572.

Peresani, M., Dallatorre, S., Astuti, P., Dal Colle, M., Ziggiotti, S. and Peretto, C. (2014) 'Symbolic or utilitarian? Juggling interpretations of Neanderthal behaviour: new inferences from the study of engraved stone surfaces' in *Journal of Anthropological Sciences*, Vol. 92, pp. 233-255.

Pétillon, J.-M. (2008) 'First evidence of a whale-bone industry in the western European Upper Paleolithic: Magdalenian artifacts from Isturitz (Pyrénées-Atlantiques, France)' in *Journal of Human Evolution*, Vol. 54, pp. 720-726.

Pétillon, J.-M. (2008) 'What are these barbs for? Preliminary reflections on the function of the Upper Magdalenian barbed weapon tips' in *Palethnologie*, vol. 1, pp. 66-97.

Pétillon, J.-M. (2013) 'Circulation of whale-bone artifacts in the northern Pyrenees during the late Upper Paleolithic' in *Journal of Human Evolution*, Vol. 65, pp. 525-543.

Pétillon, J.-M. (2015) 'Technological evolution of hunting implements among Pleistocene hunter-gatherers: Osseous projectile points in the middle and upper Magdalenian (19-14 ka cal BP)' in *Quaternary International*, DOI 10.1016/j.quaint.2015.08.063

Pétillon, J.-M. and Ducasse, S. (2012) 'From flakes to grooves: A technical shift in antlerworking during the last glacial maximum in southwest France' in *Journal of Human Evolution*, Vol. 62, pp. 435-465.

Pettitt, P. B. (2000) 'Neanderthal Lifecycles: Developmental and Social Phases in the Lives of the Last Archaics' in *World Archaeology*, Vol. 31, No. 3, pp. 351-366.

Pettitt, P. B. (2003/4) 'Is this the infancy of art? Or the art of an infant? A possible Neanderthal face from La Roche-Cotard, France' in *Before Farming*, Vol. 11, pp. 1-3.

Pettitt, P. B. (2009) 'The Living Dead and the Dead Living: Burials, Figurines and Social Performance in the European Mid Upper Palaeolithic' in R. Gowland and C. Knüsel (Eds.) *Social Archaeology of Funerary Remains*, pp. 292-308. Oxford: Oxbow Books.

Pettitt, P. (2011) *The Palaeolithic Origins of Human Burial*. London: Routledge.

Pettitt, P. (2013) 'The European Upper Palaeolithic' in V. Cummings, P. Jordan and M. Zvelebil (Eds.) *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*, DOI 10.1093/oxfordhb/9780199551224.013.052

Pettitt, P., Arias, P., García-Diez, M., Hoffmann, D., Castillejo, A. M., Ontañon-Peredo, R., Pike, A. and Zilhão, J. (2015) 'Are hand stencils in European cave art older than we think? An evaluation of the existing data and their potential implications' in P. Bueno-Ramírez and P. Bahn (Eds) *Prehistoric Art as Prehistoric Culture: Studies in Honour of Professor Rodrigo de Balbín-Behrmann*, pp. 31-43. Oxford: Archaeopress.

Pettitt, P. and Bahn, P. (2003) 'Current problems in dating Palaeolithic cave art: Candamo and Chauvet' in *Antiquity*, Vol. 77, No. 295, pp. 134-141.

Pettitt, P. and Bahn, P. (2014) 'Against Chauvet-nism. A critique of recent attempts to validate an early chronology for the art of Chauvet Cave' in *L'Anthropologie*, Vol. 118, pp. 163-182.

Pettitt, P. and Bahn, P. (2015) 'An alternative chronology for the art of Chauvet cave' in *Antiquity*, Vol. 89, No. 345, pp. 542-553.

Pettitt, P. Bahn, P. and Rippoll, S. (2007) *Palaeolithic Cave Art at Creswell Crags in European Context*. Oxford: Oxford University Press.

Pettitt, P., Maximiano Castillejo, A., Arias, P., Ontañón Peredo, R. and Harrison, R. (2014) 'New views on old hands: the context of stencils in El Castillo and La Garma caves (Cantabria, Spain)' in *Antiquity*, Vol. 88, pp. 47-63.

Pettitt, P. and Pike, A. (2007) 'Dating European Palaeolithic Cave Art: Progress, Prospects, Problems' in *Journal of Archaeological Method and Theory*, Vol. 14, No. 1, pp. 27-47.

Pettitt, P., Rockman, M. and Chenery, S. (2012) 'The British Final Magdalenian: Society, settlement and raw material movements revealed through LA-ICP-MS trace element analysis of diagnostic artefacts' in *Quaternary International*, Vol. 272-273, pp. 275-287.

Pettitt, P. and White, M. (2012) *The British Palaeolithic: Hominin Societies at the edge of the Pleistocene World*. UK: Routledge.

Phillips, K. A. (1998) Tool Use in Wild Capuchin Monkeys (*Cebus albifrons trinitatis*)' in *American Journal of Primatology*, Vol. 46, pp. 259-261.

Pigeaud, R. (1999) 'Art mobilier sur support contenant: etude des proportions de trois chevaux magdaléniens conservés au Musée des Antiquités Nationales et de leur inscription dans le colume de la pièce' in *Antiquités Nationales*, Vol. 31, pp. 11-43.

Pigeot, N. (1990) 'Technical and Social Actors. Flintknapping Specialists and Apprentices at Magdalenian Etiolles' in *Archaeological Review from Cambridge*, Vol. 90, No. 1, pp. 127-141.

Pike, A. W. G., Hoffmann, D. L., García-Diez, M., Pettitt, P. B., Alcolea, J., De Balbín, R., González-Sainz, C., de las Heras, C. Lasheras, J. A., Montes, R. and Zilhão, J. (2012) 'U-Series Dating of paleolithic Art in 11 Caves in Spain' in *Science*, Vol. 336, pp. 1409-1413.

Pike, A. W. G., Hoffmann, D. L., Pettitt, P. B., García-Diez, M., Zilhão, J. (2016) 'Dating Palaeolithic cave art: Why U-Th is the way to go' in *Quaternary International*, <http://dx.doi.org/10.1016/j.quaint.2015.12.013>

Piprani, J. (2011) 'Material Culture, Behaviour, and Identity: The Human Body as Experiential Nexus' in *Time and Mind: The Journal of Archaeology, Consciousness and Culture*, Vol. 4, No. 3, pp. 325-336.

Piskorska, T., Stefaniak, K., Krajcarz, M. and Krajcarz, M. T. (2015) 'Reindeer during the Upper Palaeolithic in Poland: Aspects of variability and paleoecology' in *Quaternary International*, Vol. 359-360, pp. 157-177.

Plisson, H. and Zotkina, L. V. (2015) 'From 2D to 3D at macro- and microscopic scale in rock art studies' in *Digital Applications in Archaeology and Cultural Heritage*, Vol. 2, pp. 102-119.

Połtowicz-Bobak, M. (2009) 'Magdalenian settlement in Poland in the light of recent research' in M. Street, N. Barton and T. Terberger (Eds.) in *Humans, Environment and Chronology of the Late Glacial of the North European Plain*, pp. 55-66. Germany: Römisch-Germanisches Zentralmuseum.

Porr, M. (2015) 'Beyond Animality and Humanity. Landscape, Metaphor and Identity in the Early Upper Palaeolithic of Central Europe' in F. Coward, R. Hosfield, M. Pope and F. Wenban-Smith (Eds.) *Landscapes in Mind: Settlement, Society and Cognition in Human Evolution*, pp. 54-74. Cambridge: Cambridge University Press.

Porr, M. and Alt, K. W. (2006) 'The burial of Bad Dürrenberg, Central Germany: osteopathology and osteoarchaeology of a Late Mesolithic shaman's grave' in *International Journal of Osteoarchaeology*, Vol. 16, No. 5, pp. 395-406.

Porr, M. and Bell, H. R. (2012) "'Rock-art', 'Animism' and Two-way Thinking: Towards a Complementary Epistemology in the Understanding of Material Culture and 'Rock-art' of Hunting and Gathering People' in *Journal of Archaeological Method and Theory*, Vol. 19, pp. 161-205.

Porr, M. and de Maria, K. (2015) 'Perceiving Animals, Perceiving humans: 'Animism' and the Aurignacian Mobile Art of southwestern Germany' in S. Sázelová, M. Novák and A. Mizerová (Eds.) *Forgotten Times and Spaces: New Perspectives in Paleoanthropological, Paleontological and Archaeological Studies*, pp. 293-302. Brno: Institute of Archaeology of the Czech Academy of Sciences.

Power, R. C., Salazar-García, D. C., Straus, L. G., González Morales, M. R. and Henry, A. G. (2015) 'Microremains from El Miron Cave human dental calculus suggest a mixed plant-animal subsistence economy during the Magdalenian in Northern Iberia' in *Journal of Archaeological Science*, Vol. 60, pp. 39-46.

Prüfer, K., Racimo, F., Patterson, N., Jay, F., Sankararaman, S., Sawyer, S., Heinze, A., Renaud, G., Sudmant, P. H., De Filippo, C., Li, H., Mallick, S., Dannemann, M. Fu, Q., Kircher, M., Kuhlwilm, M., Lachmann, M., Meyer, M., Ongyerth, M., Siebauer, M., Theunert, C., Tandon, A., Moorjani, P., Pickrell, J., Mullikin, J. C., Vohr, S. H., Green, R. E., Hellmann, I., Johnson, P. L. F., Blanche, H., Cann, H., Kitzman, J. O., Shendure, J., Eichler, E. E., Lein, E. S., Bakken, T. E., Golovanova, L. V., Doronichev, V. B., Shunkov, M. V., Derevianko, A. P., Viola, B., Slatkin, M., Reich, D., Kelso, J. Pääbo, S. (2014) 'The complete genome sequence of a Neanderthal from the Altai Mountains' in *Nature*, Vol. 505, pp. 43-49.

Pruvost, M., Bellone, R., Benecke, N., Sandoval-Castellanos, E., Cieslak, M., Kuznetsova, T., Morales-Muñiz, A., O'Connor, T., Reissmann, M., Hofreiter, M. and Ludwig, A. (2011) 'Genotypes of predomestic horses match phenotypes painted in Paleolithic works of cave art' in *Proceedings of the National Academy of Science*, Vol. 108, No. 46, pp. 18626-18630.

Purtschert, P. (2015) 'The return of the native: racialised space, colonial debris and the human zoo' in *Identities*, Vol. 22, No. 4, pp. 508-523.

Quiles, A., Valladas, H., Bocherens, H., Delqué-Količ, E., Kaltnecker, E., van der plicht, J., Delannoy, J.-J., Feruglio, V., Fritz, C., Monney, J., Philippe, M., Tosello, G., Clottes, J. and Geneste, J.-M. (2016) 'A high-precision chronological model for the decorated Upper Paleolithic cave of Chauvet-Pont d'Arc, Ardèche, France' in *Proceedings of the National Academy of Science*, Vol. 113, No. 17, pp. 4670-4675.

Radovčić, D., Oros Sršen, A., Radovčić, J. and Frayer, D. W. (2015) 'Evidence for Neandertal Jewelry: Modified White-Tailed Eagle Claws at Krapina' in *PLoS ONE*, Vol. 10, No. 3, e0119802.

Raymond, A. (1986) 'Experiments in the Function and Performance of the Weighted Atlatl' in *World Archaeology*, Vol. 18, No. 2, pp. 153-177.

Read, C. H. (1902) *A Guide to the Antiquities of the Stone Age in the Department of British and Mediæval Antiquities*. London: William Clowes and Sons.

Reich, D., Green, R. E., Kircher, M., Krause, J., Patterson, N., Durand, E. Y., Viola, B., Briggs, A. W., Stenzel, U., Johnson, P. L., Maricic, T., Good, J. M., Marques-Bonet, T., Alkan, C., Fu, Q., Mallick, S., Li, H., Meyer, M., Eichler, E. E., Stoneking, M., Richards, M., Talamo, S., Shunkov, M. V., Derevianko, A. P., Hublin, J.-J., Kelso, J., Slatkin, M., Pääbo, S. (2010) 'Genetic history of an archaic hominin group from Denisova Cave in Siberia', Vol. 468, pp. 1053-1060.

Reich, D., Patterson, N., Kircher, M., Delfin, F., Nandineni, M. R., Pugach, I., Min-Shan, A., Ko, Y.-C., Jinam, T. A., Phipps, M. E., Saitou, N., Wollstein, A., Kayser, M., Pääbo, S. and Stoneking, M. (2011) 'Denisova Admixture and the First Modern Human Dispersals into Southeast Asia and Oceania', *The American Journal of Human Genetics*, Vol. 89, pp. 516-528.

Reimers, E., Miller, F. L., Eftestøl, S., Colman, J. E., Dahle, B. (2005) 'Flight by feral reindeer *Rangifer tarandus* in response to a directly approaching human on foot or on skis' in *Wildlife Biology*, Vol. 12, No. 4, pp. 403-413.

Renfrew, C. (1994) 'Towards a cognitive archaeology' in C. Renfrew, and E. B. W. Zubrow (1994) *The Ancient Mind: Elements of Cognitive Archaeology*, pp. 3-11. Cambridge: Cambridge University Press.

Rensink, E. (2012) 'Magdalenian hunter-gatherers in the northern loess area between the Meuse and Rhine – New insights from the excavation at Eysersheide (SE Netherlands)' in *Quaternary International*, Vol. 272-273, pp. 251-263.

Reyes-García, V., Pyhälä, A., Díaz-Reviriego, I., Duda, R., Fernández-Llamazares, Á., Gallois, S., Guèze, M. and Napitulpu, L. (2016) 'Schooling, Local Knowledge and Working Memory: A Study among Three Contemporary Hunter-Gatherer Societies' in *PLoS ONE*, Vol. 11, No. 1, e0145265.

Richards, M. P. and Hedges, R. E. M. (2000) 'Gough's cave and Sun Hole Cave Human Stable Isotope Values Indicate a High Animal Protein Diet in the British Upper Palaeolithic' in *Journal of Archaeological Science*, Vol. 27, pp. 1-3.

- Richards, M. P., Jacobi, R., Cook, J., Pettitt, P. B. and Stringer, C. B. (2005) 'Isotope evidence for the intensive use of marine foods by Late Upper Palaeolithic humans' in *Journal of Human Evolution*, Vol. 49, pp. 390-394.
- Rice, P. C. (1981) 'Prehistoric Venuses: Symbols of Motherhood or Womanhood?' in *Journal of Anthropological Research*, Vol. 37, pp. 402-414.
- Rice, P. C. and Paterson, A. L. (1996) 'Bone Art in the Upper Paleolithic: Regional, Temporal, and Art Class Comparisons' in *Cross-Cultural Research*, Vol. 30, pp. 211-242.
- Riede, F. and Tallaavaara, M. (2014) 'The Lateglacial and postglacial pioneer colonisation of northern Europe – an introduction' in F. Riede and M. Tallaavaara (Eds.) *Lateglacial and Postglacial Pioneers in Northern Europe. British Archaeological Reports International Series 2559*, pg. 3-10. Oxford: Archaeopress.
- Riel-Salvatore, J. and Clark, G. A. (2001) 'Grave Markers: Middle and Early Upper Palaeolithic Burials and the Use of Chronotypology in Contemporary Paleolithic Research' in *Current Anthropology*, Vol. 42, No. 4, pp. 449-479.
- Riel-Salvatore, J. and Gravel-Miguel, C. (2013) 'Upper Palaeolithic Mortuary Practices in Eurasia: A Critical Look at the Burial Record' in L. Nilsson Stutz and S. Tarlow (Eds.) *The Oxford Handbook of the Archaeology of Death and Burial*, DOI: 10.1093/oxfordhb/978019956069.013.0017.
- Rifkin, R. (2009) 'Engraved art and acoustic resonance: exploring ritual and sound in north-western South Africa' in *Antiquity*, Vol. 83, No. 321, pp. 585-601.
- Rifkin, R. F. (2011) 'Assessing the Efficacy of Red Ochre as a Prehistoric Hide Tanning Ingredient' in *Journal of African Archaeology*, Vol. 9, No. 2, pp. 131-158.
- Rifkin, R. F. (2012) 'Processing ochre in the Middle Stone Age: Testing the inference of prehistoric behaviours from actualistically derived experimental data' in *Journal of Anthropological Archaeology*, Vol. 31, pp. 174-195.
- Rifkin, R. F., Dayet, L., Queffelec, A., Summers, B., Lategan, M., d'Errico, F. (2015) Evaluating the Photoprotective Effects of Ochre on Human Skin by *In Vivo* SPF Assessment: Implications for Human Evolution, Adaptation and Dispersal. *PLoS ONE* 10(9), DOI: 10.1371/journal.pone.0136090.

- Rifkin, R. F., Prinsloo, L. C., Dayet, L., Haaland, M. M., Henshilwood, C. S., Lozano Diz, E., Moyo, S., Vogelsang, R. and Kambombo, F. (2016) 'Characterising pigments on 30 000-year-old portable art from Apollo 11 Cave, Karas Region, southern Namibia' in *Journal of Archaeological Science: Reports*, Vol. 5, pp. 336-347.
- Rillardon, M. and Brugal, J.-P. (2014) 'What about the Broad Spectrum Revolution? Subsistence strategy of hunter-gatherers in Southeast France between 20 and 8 ka BP' in *Quaternary International*, Vol. 337, pp. 129-153.
- Rival, L. (2005) 'The attachment of the soul to the body among the Huaorani of Amazonian Ecuador' in *Ethnos*, Vol. 70, No. 3, pp. 285-310.
- Rival, L. M. (2006) 'The Huaorani' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 101-104. Cambridge: Cambridge University Press.
- Rivero, O. (2016) 'Master and apprentice: Evidence for learning in Palaeolithic portable art' in *Journal of Archaeological Science*, Vol. 75, pp. 89-100.
- Rivero, O. and Sauvet, G. (2014) 'Defining Magdalenian cultural groups in Franco-Cantabria by the formal analysis of portable artworks' in *Antiquity*, Vol. 88, pp. 64-80.
- Robert, E. (2016) 'The role of the cave in the expression of prehistoric societies' in *Quaternary International*, DOI 10.1016/j.quaint.2015.11.083
- Rodriguez-Vidal, J., d'Errico, F., Pacheco, F. G., Blasco, R., Rosell, J., Jennings, R. P., Queffelec, A., Finlayson, G., Fa, D. A., Gutiérrez López, J. M., Carrión, J. S., Negro, J. J., Finlayson, S., Cáceres, L. M., Bernal, M. A., Fernández Jiménez, S. and Finlayson, C. (2014) 'A rock engraving made by Neanderthals in Gibraltar' in *Proceedings of the National Academy of Sciences*, doi: 10.1073.
- Roebroeks, W., Sier, M. J., Kellberg Nielsen, T., De Loecker, D., Parés, J. M., Arps, C. E. S. and Múcher, H. J. (2012) 'Use of red ochre by early Neanderthals' in *Proceedings of the National Academy of Sciences*, Vol. 109, No. 6, pp. 1889-1894.
- Roebroeks, W. and Villa, P. (2011) 'On the earliest habitual use of fire in Europe' in *Proceedings of the National Academy of Science*, Vol. 108, No. 13, pp. 5209-5214.
- Roldán, C., Villaverde, V., Ródenas, I., Novelli, F. and Murcia, S. (2013) 'Preliminary analysis of Palaeolithic black pigments in plaquettes from the Parpalló cave (Gandía, Spain) carried

out by means of non-destructive techniques' in *Journal of Archaeological Science*, Vol. 40, pp. 744-754.

Romandini, M., Fiore, I., Gala, M., Cestari, M., Guida, G., Tagliacozzo, A. and Peresani, M. (2016) 'Neanderthal scraping and manual handling of raptors wing bones: Evidence from Fumane Cave. Experimental activities and comparison' in *Quaternary International*, DOI 10.1016/j.quaint.2015.12.078

Romandini, M., Peresani, M., Laroulandie, V., Metz, L., Pastoors, A., Vaquero, M. and Slimak, L. (2014) 'Convergent Evidence of Eagle Talons Used by Late Neanderthals in Europe: A Further Assessment on Symbolism' in *PLOS ONE*, Vol. 9, No. 7, e101278.

Ross, M. (2001) 'Emerging trends in rock-art research: hunter-gatherer culture, land and landscape' in *Antiquity*, Vol. 75, pp. 543-548.

Rowley-Conwy, P. (2014) 'Christian Jürgensen Thomsen and Jens Jacob Asmussen Worsaae 1788-1865 and 1821-85 the three age system' in B. Fagan (Ed.) *The Great Archaeologists*, pg. 21-24. United Kingdom: Thames and Hudson.

Roveland, B. (2000) 'Footprints in the clay: Upper Palaeolithic children in ritual and secular contexts' in J. Sofaer Derevenski (Ed.) *Children and Material Culture*, pp. 29-38. London: Routledge.

Rumsey, A. (2000) 'Agency, Personhood and the 'I' of Discourse in the Pacific and Beyond' in *Journal of the Royal Anthropological Institute*, Vol. 6, pp. 101-115.

Sackett, J. (1985) 'Style and Ethnicity in the Kalahari: A Reply to Wiessner' in *American Antiquity*, Vol. 50, No. 1, pp. 154-159.

Saitta, D. J. (1982) 'The Poverty of Philosophy in Archaeology' in J. A. Moore and A. S. Keene (Eds.) *Archaeological Hammers and Theories*, pp. 299-304. New York: Academic Press.

San Juan Foucher, C. and Vercoutère, C. (2013) 'Côtes' in L. Mons, S. Péan, and R. Pigeaud, (Eds.) *Matières d'art: représentations préhistoriques et supports osseux, relations et constraints*, pp. 107-142. France: éditions errance.

Santos da Rosa, N., Cura, S., Garcês, S. and Cura, P. (2014) 'Between Tools and Engravings: Technology and Experimental Archaeology to the Study of Cachão Do Algarve Rock Art' in S. Cura, J. Cerezer, M. Gurova, B. Santander, L. Oosterbeek and J. Cristóvão (Eds.) *Technology*

and Experimentation in Archaeology, British Archaeology Reports International Series 2657, pp. 87-96. Oxford: Archaeopress.

Sasaki, M., Endo, H., Yamagiwa, D., Yamamoto, M., Arishima, K. and Hayashi, Y. (1999) 'Morphological character of the shoulder and leg skeleton in Przewalski's horse' in *Annals of Anatomy*, Vol. 181, pp. 403-407.

Saslow, C. A. (2002) 'Understanding the perceptual world of horses' in *Applied Animal Behaviour Science*, Vol. 78, pp. 209-224.

Sauvet, G., Bourrillon, R., Conkey, M., Fritz, C., Gárate-Maidagan, D., Vilá, O. R., Tosello, G. and White, R. (2015) 'Uranium-thorium dating method and Palaeolithic rock art' in *Quaternary International*, DOI <http://dx.doi.org/10.1016/j.quaint.2015.03.053>

Savage-Rumbaugh, S. and Lewin, R. (1994) *Kanzi: The Ape at the Brink of the Human Mind*. London: Doubleday.

Schick, K. D., Toth, N. and Garufi, G., Savage-Rumbaugh, E. S., Rumbaugh, D. and Sevcik, R. (1999) 'Continuing Investigation into Stone Tool-making and Tool-using Capabilities of a Bonobo (*Pan paniscus*)' in *Journal of Archaeological Science*, Vol. 26, pp. 821-832.

Schlanger, N. (2014) 'Gabriel de Mortillet 1821-98 classifying human cultural evolution' in B. Fagan (Ed.) *The Great Archaeologists*, pp. 28-30. United Kingdom: Thames and Hudson.

Schweitzer, P. P. (2006) 'The Chukchi and Siberian Yupik of the Chukchi Peninsula, Russia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 137-141. Cambridge: Cambridge University Press.

Schwendler, R. H. (2012) 'Diversity in social organization across Magdalenian Western Europe ca. 17-12,000 BP' in *Quaternary International*, Vol. 272-273, pp. 333-353.

Semenov, S. A. (1970) *Prehistoric Technology: an Experimental Study of the oldest Tools and Artefacts from traces of manufacture and Wear*. Bath: Adams and Dart.

Serpell, J. A. (1987) 'Pet-keeping in non-western societies: some popular misconceptions' in *Anthrozoos: A Multidisciplinary Journal of The Interactions of People and Animals*, Vol. 1, No. 3, pp. 166-174.

- Shah, S. R., Des Jardins, J. D. and Blob, R. W. (2008) 'Antler stiffness in caribou (*Rangifer tarandus*): Testing variation in bone material properties between males and females' in *Zoology*, Vol. 111, pp. 476-482.
- Shanks, M. (2007) 'Symmetrical archaeology' in *World Archaeology*, Vol. 39, No. 4, pp. 589-596.
- Sharpe, K. and Van Gelder, L. (2006) 'The Study of Finger Flutings' in *Cambridge Archaeological Journal*, Vol. 16, No. 3, pp. 281-295.
- Shea, J. E. (2006) 'Child's Play: Reflections on the Invisibility of Children in the Palaeolithic Record' in *Evolutionary Anthropology*, Vol. 15, pp. 212-216.
- Shipman, P. (2009) 'The woof at the door' in *American Scientist*, Vol. 97, pp. 198-201.
- Shipman, P. (2015a) 'How do you kill 86 mammoths? Taphonomic investigations of mammoth megasites' in *Quaternary International*, Vol. 359, pp. 38-46.
- Shipman, P. (2015b) *The Invaders: How Humans and Their Dogs Drove Neandertals to Extinction*. Massachusetts: The Belknap Press.
- Shnirelman, V. A. (2006) 'The Itenm'i' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 147-151. Cambridge: Cambridge University Press.
- Sieveking, A. (1971) 'Palaeolithic Decorated Bone Discs' in *The British Museum Quarterly*, Vol. 35, No. 1/4, pp. 206-229.
- Sieveking, A. (1979) *The Cave Artists*. London: Thames and Hudson.
- Sieveking, A. (1987a) *A Catalogue of Palaeolithic Art in the British Museum*. London: British Museum Publications.
- Sieveking, A. (1987b) *Engraved Magdalenian Plaquettes: a regional and stylistic analysis of stone, bone and antler plaquettes from Upper Palaeolithic sites in France and Cantabric Spain*. *British Archaeological Reports International Series 369*. Oxford: Archaeopress.
- Sieveking, A. (1991) 'Palaeolithic Art and Archaeology: The Mobiliary Evidence' in *Proceedings of the Prehistoric Society*, Vol. 57, pp. 33-50.

- Simpson, A., Clogg, P., Díaz-Andreu, M. and Larkman, B. (2004) 'Towards three-dimensional non-invasive recording of incised rock art' in *Antiquity*, Vol. 78, pp. 692-698.
- Sinclair, A. (1995) 'The technique as a symbol in Late Glacial Europe' in *World Archaeology*, Vol. 27, No. 1, pp. 50-62.
- Sinclair, A. (2015) 'All in a Day's Work? Early Conflicts in Expertise, Life History and Time Management' in F. S. Coward, R. Hosfield, M. Pope and F. F. Wenban-Smith (Eds.) *Settlement, Society and Cognition in Human Evolution: Landscapes in the Mind*, pp. 95-116. Cambridge: Cambridge University Press.
- Slizewski, A., Friess, M. and Semal, P. (2010) 'Surface scanning of anthropological specimens: nominal-actual comparison with low cost laser scanner and high end fringe light projection surface scanning systems' in *Quartär*, Vol. 57, pp. 179-187.
- Slizewski, A. and Semal, P. (2009) 'Experiences with low and high cost 3D surface scanner' in *Quartär*, Vol. 56, pp. 131-138.
- Smith, D. C., Bouchard, M. and Lorblanchet, M. (1999) 'An initial Raman Microscopic Investigation of Prehistoric Rock Art of the Quercy District, S. W. France' in *Journal of Raman Spectroscopy*, Vol. 30, pp. 347-354.
- Smith, G. D. and Clark, R. J. H. (2004) 'Raman microscopy in archaeological science' in *Journal of Archaeological Science*, Vol. 31, pp. 1137-1160.
- Smith, T. (2006) *The Real Rudolph: A Natural History of the Reindeer*. UK: Sutton Publishing.
- Snow, D. R. (2006) 'Sexual dimorphism in Upper Palaeolithic hand stencils' in *Antiquity*, Vol. 80, No. 308, pp. 390-404.
- Snow, D. R. (2013) 'Sexual Dimorphism in European Upper Paleolithic Cave Art' in *American Antiquity*, Vol. 78, No. 4, pp. 746-761.
- Snyder, K. A. (2002) 'Modern Cows and Exotic Trees: Identity, Personhood and Exchange among Iraqw of Tanzania' in *Ethnology*, Vol. 41, No. 2, pp. 155-173.
- Soffer, O. (2004) 'Recovering Perishable Technologies through use Wear on Tools: Preliminary Evidence for Upper Palaeolithic Weaving and Net Making' in *Current Anthropology*, Vol. 45, No. 3, pp. 407-413.

Soffer, O. and Adovasio, J. M. (2010) 'The Role of Perishable Technologies in Upper Paleolithic Lives' in E. Zubrow, F. Audouze and J. Enloe (Eds.) *The Magdalenian Household: Unraveling Domesticity*, pp. 235-244. USA: State University of New York Press.

Soffer, O., Adovasio, J. M. and Hyland, D. C. (2000) 'The "Venus" Figurines: Textiles, Basketry, Gender, and Status in the Upper Palaeolithic [and comments and reply]' in *Current Anthropology*, Vol. 41, No. 4, pp. 511-531.

Soffer, O., Adovasio, J. M., Illingsworth, J. S., Amirkhanov, H. A., Praslov, N. D. and Street, M. (2000) 'Palaeolithic perishables made permanent' in *Antiquity*, Vol. 74, No. 286, pp. 812-821.

Soffer, O., Vandiver, P., Klíma, B. and Svoboda, J. (1993) 'The Pyrotechnology of Performance Art: Moravian Venuses and Wolverines' in H. Knecht, A. Pike-Tay and R. White (Eds.) *Before Lascaux: The Complete Record of the Early Upper Paleolithic*, pp. 259-275. UK: CRC Press.

Solari, A., Olivera, D., Gordillo, I., Bosch, P., Fetter, G., Lara, V. H. and Novelo, O. (2015) 'Cooked Bones? Method and Practice for Identifying Bones Treated at Low Temperature' in *International Journal of Osteoarchaeology*, Vol. 25, pp. 426-440.

Solomon, A. (2006) 'San 'Spirituality' and Human Evolution: Eight Questions for Lewis-Williams and Pearce' in *The South Africa Archaeological bulletin*, Vol. 61, No. 184, pp. 209-212.

Song, E. (2006) 'The Dulong of Southwestern China' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 303-306. Cambridge: Cambridge University Press.

Soubrier, J., Gower, G., Chen, K., Richards, S. M., Llamas, B., Mitchell, K. J., Ho, S. Y. W., Kosintsev, P., Lee, M. S. Y., Baryshnikov, G., Bollongino, R., Bover, P., Burger, J., Chivall, D., Crégut-Bonnoure, E., Decker, J. E., Doronichev, V. B., Douka, K., Fordham, D. A., Fontana, F., Fritz, C., Glimmerveen, J., Golovanova, L. V., Groves, C., Guerreschi A., Haak, W., Higham, T., Hofman-Kamińska, E., Immel, A., Julien, M.-A., Krause, J., Krotova, O., Langbein, F., Larson, G., Rohrlach, A., Scheu, A., Schnabel, R. D., Taylor, J. F., Tokarska, M., Tosello, G., van der Plicht, J., van Loenen, A., Vigne, J.-D., Wooley, O., Orlando, L., Kowalczyk, R., Shapiro, B. and Cooper, A. (2016) 'Early Cave art and ancient DNA record the origin of European bison' in *Nature Communications*, DOI: 10.1038/ncomms13158

Spikins, P. A. (2015) *How Compassion Made Us Human: The Evolutionary Origins of Tenderness, Trust and Morality*. UK: Pen and Sword Books Ltd.

Spikins, P. A., Hitchens, G. and Needham, A. P. (2017) 'Strangers in a Strange Land? Intimate sociality and emergent creativity in Middle Palaeolithic Europe' in B. Finlayson and G. Warren (Eds.) *The Diversity of Hunter Gatherer Pasts*, pp. 132-147. Oxford: Oxbow Books.

Spikins, P. A., Hitchens, G., Needham, A. P. and Rutherford, H. E. (2014) 'The Cradle of Thought: Growth, Learning, Play and Attachment in Neanderthal Children' in *Oxford Journal of Archaeology*, Vol. 33, No. 2, pp. 111-134.

Spikins, P. A., Rutherford, H. E. and Needham, A. P. (2010) 'From Homininity to Humanity: Compassion from the Earliest Archaics to Modern Humans' in *Time and Mind: The Journal of Archaeology, Consciousness and Culture*, Vol. 3, No. 3, pp. 303-326.

Stapert, D. (2007) 'Neanderthal children and their flints' in *PalArch's Journal of Archaeology of Northwest Europe*, Vol. 1, No. 2, pp. 16-40.

Stegeborn, W. (2006) 'The Wanniyala-aetto (Veddahs) of Sri Lanka' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 269-273. Cambridge: Cambridge University Press.

Sterling, K. (2014) 'Social Landscapes of the Late Palaeolithic: Marking Meaning in the Magdalenian' in *European Journal of Archaeology*, Vol. 18, No. 3, pp. 380-401.

Stevens, R. E., Hermoso-Buxán, X. L., Marín-Arroyo, A. B., Gonzalez-Morales, M. R. and Straus, L. G. (2014) 'Investigation of Late Pleistocene and Early Holocene Environmental change at El Mirón cave (Cantabria, Spain): Insights from carbon and nitrogen isotope analyses of red deer' in *Palaeogeography, Palaeoclimatology, Palaeoecology*, Vol. 414, pp. 46-60.

Stevens, R. E., Jacobi, R. M. and Higham, T. F. G. (2010) 'Reassessing the diet of Upper Palaeolithic humans from Gough's Cave and Sun Hole, Cheddar Gorge, Somerset, UK' in *Journal of Archaeological Science*, Vol. 37, pp. 52-61.

Stevens, R. E., Jacobi, R., Street, M., Germonpré, M., Conard, N. J., Münzel, S. C. and Hedges, R. E. M. (2008) 'Nitrogen isotope analyses of reindeer (*rangifer tarandus*), 45,000

BP to 9,000 BP: Palaeoenvironmental reconstructions' in *Palaeogeography, Palaeoclimatology, Palaeoecology*, Vol. 262, pp. 32-45.

Stevens, R. E., O'Connell, T., Hedges, R. E. M. and Street, M. (2009) 'Radiocarbon and stable isotope investigations at the Central Rhineland sites of Gönnersdorf and Andernach-martinsberg, Germany' in *Journal of Human Evolution*, Vol. 57, pp. 131-148.

Stone, E. A. (2009) 'Wear on Magdalenian Bone Tools: A New Methodology for Studying Evidence of Fiber Industries' in E. B. Andersson Strand, M. Gleba, U. Mannering, C. Munkholt, M. Ringgard (Eds.) *North European Symposium for Archaeological Textiles X*, pp. 225-232. Oxford: Oxbow Books.

Stone, E. A. (2011) 'The Role of Ethnographic Museum Collections in Understanding Bone Tool Use' in J. Baron and B. Kufel-Diakowska (Eds.) *Written in Bones: Studies on technological and social contexts of past faunal skeletal remains*, pp. 25-37. Poland: University of Wrocław.

Stone, E. A. (2013) 'The Identification of Perishable Technologies through Usewear on Osseous Tools: Wear Patterns on Historic and Contemporary Tools as a Standard for Identifying Raw Materials Worked in the Late Upper Palaeolithic' in A. Choyke and S. O'Connor (Eds.) *From These Bare Bones: Raw material and the study of worked osseous objects*, pp. 28-35. Oxford: Oxbow.

Strathern, M. (1990) *The Gender of the Gift: Problems with Women and Problems with Society in Melanesia*. Berkeley: University of California Press.

Strathern, M. (1995) 'Nostalgia and the New Genetics' in D. Battaglia (Ed.) *The Rhetorics of Self Making*, pp. 97-120. Berkeley: University of California Press.

Strathern, M. (1998) 'One man and many men' in M. Gaudelier and M. Strathern (Eds.) *Gig Men and Great Men Personification of power in Melanesia*, pp. 197-214. Cambridge: Cambridge University Press.

Straus, L. G. (2013) 'After the Deep Freeze: Confronting "Magdalenian" Realities in Cantabrian Spain And Beyond' in *Journal of Archaeological Method and Theory*, Vol. 20, pp. 236-255.

- Straus, L. G., González Morales, M. R. and Carretero, J. M. (2011) 'Lower Magdalenian secondary human burial in El Mirón Cave, Cantabria, Spain' in *Antiquity*, Vol. 85, pp. 1151-1164.
- Straus, L. G., González Morales, M. R., Solana, D. C. (2015) 'The Magdalenian human burial of El Mirón Cave (Ramales de la Victoria, Cantabria, Spain): introduction, background, discovery and context' in *Journal of Archaeological Science*, Vol. 60, pp. 1-9.
- Street, M., Jöris, O. and Turner, E. (2012) 'Magdalenian settlement in the German Rhineland – An update' in *Quaternary International*, Vol. 272-273, pp. 231-250.
- Street, M. and Turner, E. (2015) 'Eating crow or a feather in one's cap: The avifauna from the Magdalenian sites of Gönnersdorf and Andernach-Martinsberg (Germany)' in *Quaternary International*, DOI 10.1016/j.quaint.2015.10.006
- Suttie, J. M. and Webster, J. R. (1998) 'Are arctic ungulates physiologically unique?' in *Rangifer*, Vol. 18, No. 3-4, pp. 99-118.
- Svensson, T. G. (2006) 'The Ainu' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 132-136. Cambridge: Cambridge University Press.
- Taçon, P. S. C. (1991) 'The Power of Stone: symbolic aspects of stone use and tool development in western Arnhem Land, Australia' in *Antiquity*, Vol. 65, No. 247, pp. 192-207.
- Taçon, P. and Chippindale, C. (2008) 'Changing Places: 10,000 Years of North Australian Rock-Art Transformation' in D. Papagianni, R. Layton and H. Machner (Eds.) *Time and Change: Archaeological and Anthropological Perspectives on the Long-Term in Hunter-Gatherer Societies*, pp. 73-94. Oxford: Oxbow Books.
- Taçon, P. A. C. (2010) 'Animated animism: what does it actually tell us?' in *Rock Art Research*, Vol. 27, No. 1, pp. 77-78.
- Taller, A., Blus, M. and Conard, N. J. (2014) 'The Magdalenian of Hohle Fels Cave and the Resettlement of the Swabian Jura after the LGM' in M. Otte, F. Le Brun-Ricalens, M. Étienne and É. Simonin (Eds.) *Modes de Contacts et de Déplacements au Paléolithique Eurasiatique*, pg. 383-399. Luxembourg: Centre National de Recherche Archéologique.

- Tanaka, J. and Sugawara, K. (2006) 'The /Gui and //Gana of Botswana' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 195-199. Cambridge: Cambridge University Press.
- Taquet, P. (2007) 'Georges Cuvier: Extinction and the Animal Kingdom' in R. Huxley (Ed.) *The Great Naturalists*, pp. 202-211. UK: Thames and Hudson.
- Tarlow, S. (2000) 'Emotion in Archaeology' in *Current Anthropology*, Vol. 41, No. 5, pp. 713-746.
- Tarlow, S. (2012) 'The Archaeology of Emotion and Affect' in *Annual Review of Anthropology*, Vol. 41, pp. 169-185.
- Taylor, A. (2012) 'Projectile insets and backed pieces from the Upper Magdalenian of La Madeleine (Tursac, Dordogne, France), new data from lithic technology' in *Paleo*, Vol. 23, <http://paleo.revues.org/2461>
- Taylor, J., Beraldin, J.-A., Godin, G., Cournoyer, L., Rioux, M. and Domey, J. (2002) 'NRC 3D Imaging Technology for Museums and Heritage' in *Proceedings of The First International Workshop on 3D Virtual Heritage*, pp. 70-75. Canada: National Research Council of Canada.
- Taylor, T. (1997) *The Prehistory of Sex: Four million of human sexual culture*. London: Fourth Estate.
- Taylor, T. (2007) 'The Origins of Human Sexual Culture' in *Journal of Psychology and Human Sexuality*, Vol. 18, No.2, pp. 69-105.
- Taylor, T. (2008) 'The Willendorf Venuses: notation, iconology and materiality' in *Mitteilungen der Anthropologischen Gesellschaft in Wien*, Vol. 138, pp. 37-49.
- Terberger, T., Barton, N. and Street, M. (2009) 'The Late Glacial Reconsidered – recent progress and interpretations' in M. Street, N. Barton and T. Terberger (Eds.) in *Humans, Environment and Chronology of the Late Glacial of the North European Plain*, pp. 189-207. Germany: Römisch-Germanisches Zentralmuseum.
- Texier, P.-J., Porraz, G., Parkington, J., Rigaud, J.-P., Poggenpoel, C., Miller, C., Tribolo, C., Cartwright, C., Coudenneau, A., Klein, R., Steele, T. and Verna, C. (2010) 'A Howiesons Poort tradition of engraving ostrich eggshell containers dated to 60,000 years ago at Diepkloof Rock Shelter, South Africa' in *Proceedings of the National Academy of Sciences*, Vol. 107, No. 14, pp. 6180-6185.

- Texier, P.-J., Porraz, G., Parkington, J., Rigaud, J.-P., Poggenpoel, C. and Tribolo, C. (2013) 'The context, form and significance of the MSA engraved ostrich eggshell collection from Diepkloof Rock Shelter, Western Cape, South Africa' in *Journal of Archaeological Science*, Vol. 40, pp. 3412-3431.
- Till, R. (2014) 'Sound archaeology: terminology, Palaeolithic cave art and the soundscape' in *World Archaeology*, Vol. 46, No. 3, pp. 292-304.
- Tilley, L. (2015) 'Accommodating difference in the prehistoric past: Revisiting the case of Romito 2 from a bioarchaeology of care perspective' in *International Journal of Paleopathology*, Vol. 8, pp. 64-74.
- Tilley, L. and Cameron, T. (2014) 'Introducing the Index of Care: A Web-based application supporting archaeological research into health-related care' in *International Journal of Paleopathology*, Vol. 6, pp. 5-9.
- Thomas, J. (2005) 'Archaeometry and Materiality: Materials-Based Analysis in Theory and Practice', *Archaeometry*, 46(3), 327-338, 2004, and Reply. Comments VIII: Between 'Material Qualities' and 'Materiality' in *Archaeometry*, Vol. 47, No. 1, pp. 198-201.
- Thompson, T. J. U. (2004) 'Recent advances in the study of burned bone and their implications for forensic anthropology' in *Forensic Science International*, Vol. 146S, pp. S203—S205.
- Thomson, K. (2007) 'Charles Darwin: The Complete Naturalist' in R. Huxley (Ed.) *The Great Naturalists*, pp. 267-276. UK: Thames and Hudson.
- Thorpe, I. J. N. (2003) 'Anthropology, archaeology, and the origin of warfare' in *World Archaeology*, Vol. 35, No. 1, pp. 145-165.
- Tobias, P. V. (2002) 'Saartje Baartman: her life, her remains, and the negotiations for their repatriation from France to South Africa' in *South African Journal of Science*, Vol. 98, pp. 107-110.
- Tonkinson, R. (2006) 'The Ngarrindjeri of southeastern Australia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 343-347. Cambridge: Cambridge University Press.
- Tosello, G. (2003) *Pierres Gravées de Périgord Magdalénien: Art, Symboles, Territoires*. Paris: CNRS Editions.

- Tosello, G. and Villaverde, V. (2014) 'Portable art recording methods' in C. Smith (Ed.) *Encyclopedia of Global Archaeology*, pp. 6027-6037. New York: Springer.
- Toussaint, S. (2006) 'Kimberley peoples of Fitzroy Valley, Western Australia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 339-342. Cambridge: Cambridge University Press.
- Trigger, B. (2007) *A History of Archaeological Thought*. Cambridge: Cambridge University Press.
- Trinkaus, E. (2005) 'The Adiposity Paradox in the Middle Danubian Gravettian' in *L'Anthropologie*, Vol. 43, No. 2-3, pp. 263-271.
- Turin, M. (2006) 'The Chenchu of the Indian Deccan' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 252-256. Cambridge: Cambridge University Press.
- Tyldesley, J. A. and Bahn, P. G. (1983) 'Use of Plants in the European Palaeolithic' in *Quaternary Science Reviews*, Vol. 2, pp. 53-81.
- Ucko, P. and Rosenfeld, A. (1967) *Palaeolithic Cave Art*. New York: World University Library.
- Utrilla, P., Mazo, C., Sopena, M. C., Martínez-Bea, M. and Domingo, R. (2009) 'A Palaeolithic map from 13,660 cal BP: engraved stone blocks from the Late Magdalenian in Abauntz Cave (Navarra, Spain)' in *Journal of Human Evolution*, Vol. 57, pp. 99-111.
- Valladas, H., Cachier, H., Maurice, P., Bernaldo de Quiros, F., Clottes, J., Cabrera Valdés, V., Uzquiano, P. and Arnold, M. (1992) 'Direct radiocarbon dates for prehistoric paintings at the Altamira, El Castillo and Niaux caves' in *Nature*, Vol. 357, pp. 68-70.
- Valladas, H. and Clottes, J. (2003) 'Style, Chauvet, and radiocarbon' in *Antiquity*, Vol. 77, No. 295, pp. 142-145.
- Valladas, H., Clottes, J., Geneste, J.-M., Garcia, M. A., Arnold, M., Cachier, H., Tisnérat-laborde, N. (2001) 'evolution of prehistoric cave art' in *Nature*, Vol. 413, pp. 479.
- Van der Sluys, C. M. I. (2006) 'The Jahai of northern peninsular Malaysia' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 307-311. Cambridge: Cambridge University Press.

Van der Weerd, J., Smith, G. D., Firth, S. and Clark, R. J. H. (2004) 'Identification of black pigments on prehistoric southwest American potsherds by infrared and Raman microscopy' in *Journal of Archaeological Science*, Vol. 31, pp. 1429-1437.

van Dierendonck, M. C., Bandi, N., Batdorj, D., Dügerlham, S. and Munkhtsong, B. (1996) 'Behavioural observations of reintroduced Takhi or Przewalski horses (*Equus ferus przewalskii*) in Mongolia' in *Applied Animal Behavioural Science*, Vol. 50, pp. 95-114.

Vandiver, P. B., Soffer, O., Klima, B., Svoboda, J. (1989) 'The origins of Ceramic technology at Dolni Věstonice, Czechoslovakia' in *Science*, Vol. 246, No. 4933, pp. 1002-1008.

Vandiver, P. B., Soffer, O., Klima, B. and Svoboda, J. (1990) 'Venuses and Wolverines: The Origins of Ceramic Technology. Ca. 26,000 B.P.' in D. W. Kingery (Ed.) *The Changing Roles of Ceramics in Society: 26,000 BP to the Present (Ceramics and Civilization Vol. 5)*, pp. 13-81. USA: American Ceramic Society.

Van Gelder, L. and Sharpe, K. (2009) 'Women and Girls as Upper Palaeolithic Cave 'Artists': Deciphering the Sexes of Finger Fluters in Rouffignac Cave' in *Oxford Journal of Archaeology*, Vol. 28, No. 4, pp. 323-333.

Van Gelder, L. (2015) 'Counting the Children: The Role of Children in The production of Finger Flutings in Four Upper Palaeolithic Caves' in *Oxford Journal of Archaeology*, Vol. 34, No. 2, pp. 119-138.

Vanhaeren, M. and d'Errico, F. (2003) 'Childhood in the Epi-Palaeolithic. What do personal ornaments associated with burials tell us?' in H. Kindgren, K. Knutsson, D. Loeffler. And A. Åkerlund (Eds.) *Mesolithic on the Move. Papers Presented at the Sixth International Conference on the Mesolithic of Europe, Stockholm 2000*, pp. 494-505. Oxford: Oxbow.

Vanhaeren, M. and d'Errico, F. (2003) 'L Mobilier funéraire de la Dame de Saint-Germain-la-Rivière (Gironde) et l'origine Paléolithiques des inégalités' in *Paleo*, Vol. 15, <http://paleo.revues.org/1293>.

Vanhaeren, M. and d'Errico, F. (2005) 'Grave goods from the Saint-Germain-la-Rivière burial: Evidence for social inequality in the Upper Palaeolithic' in *Journal of Anthropological Archaeology*, Vol. 24, pp. 117-134.

- Vanhaeren, M. and d'Errico, F. (2006) 'Aurignacian ethno-linguistic geography of Europe revealed by personal ornaments' in *Journal of Archaeological Science*, Vol. 33, pp. 1105-1128.
- Vanhaeren, M., d'Errico, F., Billy, I. and Grousset, F. (2004) 'Tracing the source of Upper Palaeolithic shell beads by strontium isotope dating' in *Journal of Archaeological Science*, Vol. 31, pp. 1481-1488.
- Vanhaeren, M., d'Errico, F., Stringer, C., James, S. L., Todd, J. A. and Mienis, H. K. (2006) 'Middle Paleolithic Shell Beads in Israel and Algeria' in *Science*, Vol. 312, pp. 1785-1788.
- Vanhaeren, M., d'Errico, F., van Niekerk, K. L., Henshilwood, C. S., and Erasmus, R. M. (2013) 'Thinking strings: Additional evidence for personal ornament use in the Middle Stone Age at Blombos Cave, South Africa' in *Journal of Human Evolution*, Vol. 64, pp. 500-517.
- Vaňková, D. and Málek, J. (1997) 'Characteristics of the Vocalizations of Red Deer Cervus Elaphus Hinds and Calves' in *Bioacoustics*, Vol. 7, No. 4, pp. 281-289.
- van Reybrouck, D. (1998) 'Imaging and imagining the Neanderthal: the role of technical drawings in archaeology' in *Antiquity*, Vol. 72, No. 275, pp. 56-64.
- van Reybrouck, D. (2002) 'Boule's error: on the social context of scientific knowledge' in *Antiquity*, Vol. 76, No. 291, pp. 158-164.
- Van Reybrouck, D. (2012) *From Primitives to Primates: A History of Ethnographic and Primatological Analogies in the Study of Prehistory*. Leiden: Sidestone Press.
- van Wyhe, J. (2009) 'Charles Darwin 1809-2009' in *The International Journal of Biochemistry and Cell Biology*, Vol. 41, pp. 251-253.
- van Wyhe, J. and Kjærgaard, P. C. (2015) 'Going the whole orang: Darwin, Wallace and the natural history of orangutans' in *Studies in History and Philosophy of Biological and biomedical Sciences*, Vol. 51, pp. 53-63.
- Vellikey, E. (2013) 'Rock paintings of Squamish Valley, British Columbia: Geochemical Analysis of Pigments Using Portable X-Ray Fluorescence Spectrometry (pXRF)' in *American Indian Rock Art Research*, Vol. 39, pp. 131-141.

- Vercellotti, G., Caramella, D., Formicola, V., Fornaciari, G. and Larsen, C. S. (2010) 'Porotic Hyperostosis in a Late Upper Paleolithic Skeleton (Villabruna 1, Italy)' in *International Journal of Osteoarchaeology*, Vol. 20, pp. 358-368.
- Vidal, H. J. (2006) 'The Yamana of Tierra del Fuego' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 114-118. Cambridge: Cambridge University Press.
- Villa, P. and Roebroeks, W. (2014) 'Neanderthal Demise: An Archaeological Analysis of the Modern Human Superiority Complex' in *PLoS ONE*, Vol. 9, No. 4, e96424.
- Viveiros de Castro, V. (1998) 'Cosmological Deixis and Amerindian Perspectivism' in *The Journal of the Royal Anthropological Institute*, Vol. 4, No. 3, pp. 469-488.
- von Petzinger, G. and Nowell, A. (2011) 'A question of style: reconsidering the stylistic approach to dating Palaeolithic art in France' in *Antiquity*, Vol. 88, pp. 1165-1183.
- Wadley, L. (2005) 'Putting ochre to the test: replication studies of adhesives that may have been used for hafting tools in the Middle Stone Age' in *Journal of Human Evolution*, Vol. 49, pp. 587-601.
- Wadley, L. (2010) 'Compound-Adhesive Manufacture as a Behavioural Proxy for Complex Cognition in the Middle Stone Age' in *Current Anthropology*, Vol. 51, No. S1, pp. s111-s119.
- Wadley, L., Hodgskiss, T. and Grant, M. (2009) 'Implications for complex cognition from the hafting of tools with compound adhesives in the Middle Stone Age, South Africa' in *Proceedings of the National Academy of Science*, Vol. 196, No. 24, pp. 9590-9594.
- Wadley, L., Williamson, B. and Lombard, M. (2003) 'Ochre in hafting in Middle Stone Age southern Africa: a practical role' in *Antiquity*, Vol. 78, No. 301, pp. 661-675.
- Wadley, L. and Prinsloo, L. C. (2014) 'Experimental heat treatment of silcrete implies analogical reasoning in the Middle Stone Age' in *Journal of Human Evolution*, Vol. 70, pp. 49-60.
- Wagner, R. (1995) 'If You Have the Advertisement You Don't Need the Product' in D. Battaglia (Ed.) *The Rhetorics of Self-Making*, pp. 59-76. Berkeley: University of California Press.

- Wagner, R. (1998) 'The fractal person' in M. Godelier and M. Strathern (Eds.) *Big Men and Great Men: Personification of Power in Melanesia*, pp. 159-173. Cambridge: Cambridge University Press.
- Walker, M. (2015) *All the Colours of the Rainbow – An Experimental Investigation into the Reconstruction of the Colourscape of Mesolithic Star Carr*. Unpublished Masters Thesis, University of Manchester.
- Waller, S. J. (1993a) 'Sound and rock art' in *Nature*, Vol. 365, pp. 501.
- Waller, S. J. (1993b) 'Sound reflection as an explanation for the content and context of rock art' in *Rock Art Research*, Vol. 10, pp. 91-101.
- Wareing, K., Tickle, P. G., Stokken, K.-A., Codd, J. R. and Sellers, W. I. (2011) 'The musculoskeletal anatomy of the reindeer (*Rangifer tarandus*): fore- and hindlimb' in *Polar Biology*, Vol. 34, pp. 1571-1578.
- Watts, C. (2013) *Relational Archaeologies: Humans, Animals, Things*. London and New York: Routledge.
- Watts, I. (2010) 'The pigments from Pinnacle Point cave 13B, Western Cape, South Africa' in *Journal of Human Evolution*, Vol. 59, pp. 392-411.
- Webmoor, T. (2007) 'What about 'one more turn after the social' in archaeological reasoning? Taking things seriously' in *World Archaeology*, Vol. 39, No. 4, pp. 563-578.
- Weedman, K. J. (2002) 'On the Spur of the Moment: Effects of Age and Experience on Hafted Stone Scraper Morphology' in *American Antiquity*, Vol. 67, No. 4, pp. 731-744.
- Weedman Arthur, K. (2010) 'Feminine Knowledge and Skill Reconsidered: Women and Flaked Stone Tools' in *American Anthropologist*, Vol. 112, No. 2, pp. 228-243.
- Weiner, A. B. (1987) *The Trobrianders of Papua New Guinea*. USA: Harcourt Brace Jovanovich College Publishers.
- Weiner, A. B. (1992) *Inalienable Possessions: The Paradox of keeping-While-Giving*. Berkeley: University of California Press.
- Weinstock, J. (2002) 'Reindeer Hunting in the Upper Palaeolithic: Sex Ratios as a Reflection of Different Procurement Strategies' in *Journal of Archaeological Science*, Vol. 29, pp. 365-377.

- Welker, W. (2016) 'First Palaeolithic rock art in Germany: engravings on Hunsrück slate' in *Antiquity*, Vol. 90, No. 349, pp. 32-47.
- Welté, A.-C. (1991) 'Analyse de décor d'un os d'oiseau de l'abri Montastruc (Tarn-et-Garonne) conservé au British Museum' in *Préhistoire Ariégeoise*, Vol. 46, pp. 199-210.
- Whallon, R. (2006) 'Social networks and information: Non-"utilitarian" mobility among hunter-gatherers' in *Journal of Anthropological Archaeology*, Vol. 25, pp. 259-270.
- White, R. (1992) 'Beyond Art: Toward an Understanding of the Origins of Material Representation in Europe' in *Annual Review of Anthropology*, Vol. 21, pp. 537-564.
- White, R. (2003) *Prehistoric Art: The Symbolic Journey of Humankind*. New York: Harry N. Abrams Inc.
- White, R. (2006) 'The Women of Brassempouy: A Century of Research and Interpretation' in *Journal of Archaeological Method and Theory*, Vol. 13, No. 4, pp. 251-304.
- Whiten, A., Goodall, J., McGrew, W. C., Nishida, T., Reynolds, V., Sugiyama, Y., Tutin, C. E. G., Wrangham, R. W. and Boesch, C. (1999) 'Cultures in Chimpanzees' in *Nature*, Vol. 399, pp. 682-685.
- Whitridge, P. (2013) 'The imbrication of human and animal paths: an Arctic case study' in C. Watts (Ed.) *Relational Archaeologies: Humans, Animals, Things*, pp. 228-244. London and New York: Routledge.
- Wiessner, P. (1983) 'Style and Social Information in Kalahari San Projectile Points' in *American Antiquity*, Vol. 48, No. 2, pp. 253-276.
- Wiessner, P. (1985) 'Style or Isochrestic Variation? A Reply to Sackett' in *American Antiquity*, Vol. 50, No. 1, pp. 160-166.
- Wiessner, P. (2002) 'Taking the Risk Out of Risky Transactions: A Forager's Dilemma' in F. K. Salter (Ed.) *Risky Transactions: Trust, Kinship, Ethnicity*, pp. 21-43. New York: Bergahn Books.
- Wiessner, P. W. (2014) 'Embers of society: Firelight talk among the Ju/'hoansi Bushmen' in *Proceedings of the National Academy of Sciences*, Vol. 111, No. 39, pp. 14027-14035.

Willerslev, R. (2004) 'Not Animal, Not Not-Animal: Hunting, Imitation, and Empathetic Knowledge among the Siberian Yukaghirs' in *The Journal of the Royal Anthropological Institute*, Vol. 10, No. 3, pp. 629-652.

Willerslev, R. (2007) *Soul Hunters: Hunting, Animism, and Personhood Among the Siberian Yukaghirs*. USA: University of California Press.

Willerslev, R. (2013) 'Taking Animism Seriously, but Perhaps Not Too Seriously?' in *Religion and Society: Advances in Research*, Vol. 4, pp. 41-57.

Wilson, D. (2004) 'People Talk About Heaven...' in *Cambridge Archaeological Journal*, Vol. 14, No. 1, pp. 86-90.

Wiśniewski, T., Mroczek, P., Rodzik, J., Zagórski, P., Wilczyński, J. and Fišáková, M. N. (2012) 'On the periphery of the Magdalenian world: An open-air site in Klementowice (Lublin Upland, Eastern Poland) in *Quaternary International*, Vol. 272-273, pp. 308-321.

Wobst, H. M. (1978) 'The Archaeo-Ethnology of Hunter-Gatherers or the Tyranny of the Ethnographic Record in Archaeology' in *American Antiquity*, Vol. 32, No. 2, pp. 303-309.

Woodburn, J. (1982) 'Egalitarian Societies' in *Man*, New Series, Vol. 17, No. 3, pp. 431-451.

Worl, R. (2006) 'Inupiat Arctic Whalers' in R. B. Lee and R. Daly (Eds.) *The Cambridge Encyclopedia of Hunters and Gatherers*, pp. 61-65. Cambridge: Cambridge University Press.

Wreschner, E. E., Bolton, R., Butzer, K. W., Delporte, H., Häusler, A., Heinrich, A., Jacobson-Widding, A., Malinowski, T., Masset, C., Miller, S. F., Ronen, A., Solecki, R., Stephenson, P. H., Thomas, L. L. and Zollinger, H. (1980) 'Red Ochre and Human Evolution: A Case for Discussion [and Comments and Reply]' in *Current Anthropology*, Vol. 25, No. 5, pp. 631-644.

Wygall, B. T. and Heidenreich, M. (2014) 'Deglaciation and Human Colonization of Northern Europe' in *Journal of World Prehistory*, Vol. 27, pp. 111-144.

Wyman, M. T., Mooring, M. S., McCowan, B., Penedo, M. C. T. and Hart, L. A. (2008) 'Amplitude of bison bellows reflects male quality, physical condition and motivation' in *Animal Behaviour*, Vol. 76, pp. 1625-1639.

Wyman, M. T., Mooring, M. S., McCowan, B., Penedo, M. C. T., Reby, D and Hart, L. A. (2012) 'Acoustic cues to size and quality in the vocalizations of male North American bison, *bison bison*' in *Animal Behaviour*, Vol. 84, pp. 1381-1391.

Wynn, T. and Coolidge, F. L. (2013) *How to Think Like A Neanderthal*. Oxford: Oxford University Press.

Zilhão, J. (1995) 'The age of the Côa Valley (Portugal) rock art: validation of archaeological dating to the Palaeolithic and refutation of 'scientific' dating to historic or proto-historic times' in *Antiquity*, Vol. 69, No. 266, pp. 883-901.

Zilhão, J. (2007) 'The Emergence of Ornaments and Art: An Archaeological Perspective on the Origins of "Behavioral Modernity"' in *Journal of Archaeological Research*, Vol. 15, pp. 1-54.

Zilhão, J. (2012) 'Personal Ornaments and Symbolism Among the Neanderthals' in S. Elias (Ed.) *Origins of Human Innovation and Creativity*, pp. 35-49. The Netherlands: Elsevier.

Zilhão, J. (2014) 'The Neanderthals: Evolution, Palaeoecology, and Extinction' in V. Cummings, P. Jordan and M. Zvelebil (Eds.) *The Oxford Handbook of the Archaeology and Anthropology of Hunter-Gatherers*, DOI: 10.1093/oxfordhb/9780199551224.013.054

Zilhão, J., Angelluci, D. E., Badal-García, E., d'Errico, F., Daniel, F., Dayet, L., Douka, K., Higham, T. F. G., Martínez-Sánchez, M. J., Montes-Bernárdez, R., Murcia-Mascarós, S., Pérez-Sirvent, C., Roldán-García, C., Vanhaeren, M., Villaverde, V., Wood, R. and Zapata, J. (2010) 'Symbolic use of marine shells and mineral pigments by Iberian Neandertals' in *Proceedings of the National Academy of Science*, Vol. 107, No. 3, pp. 1023-1028.

Züchner, C. (2014) 'Comments and additional remarks on the paper by Jean Combier and Guy Jouve: New Investigations into the cultural and stylistic identity of the Chauvet Cave and its radiocarbon dating' in *L'anthropologie*, Vol. 118, pp. 186-189.