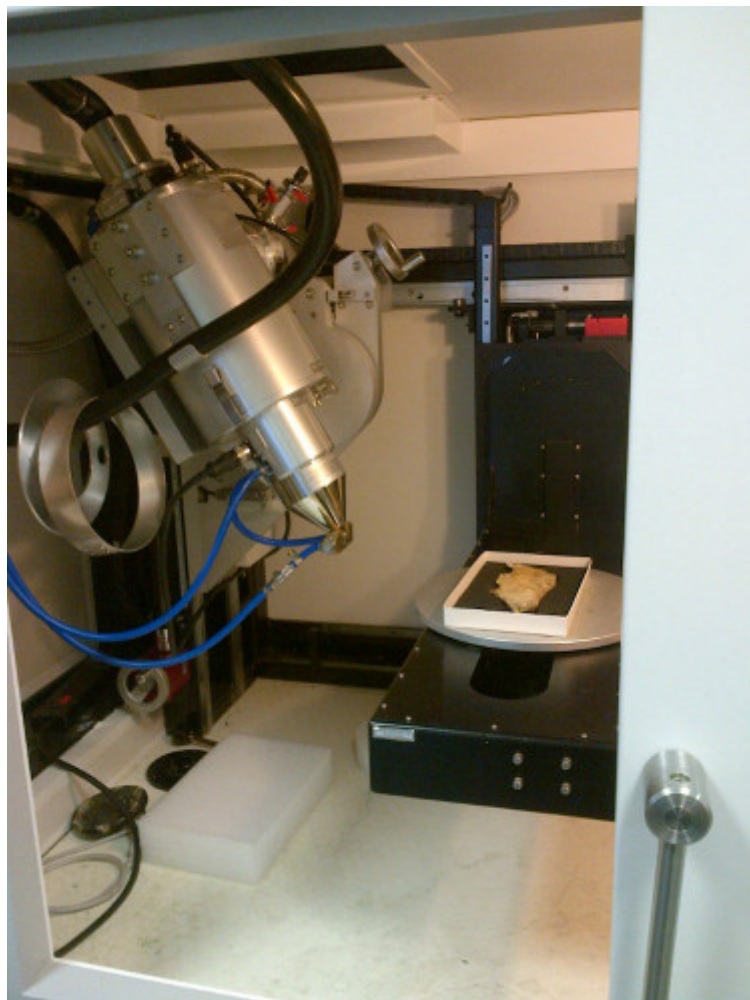


3D PRINTING AND ARCHAEOLOGY

July 24, 2015 Annemieke_Milks Digital Archaeology, Education, Experimental Archaeology, Explore Posts, Prehistory, Public Archaeology, Science 3D imaging, 3D printing, Boxgrove, experiment, Schöningen, spears

I remember thinking when I first had a tour of UCL's Institute of Making back when I started my PhD in 2013, and we saw the 3D printers – MakerBots mostly – that it would have fantastic applications for archaeology. Just few weeks later my PhD supervisor, Dr. Matt Pope, suggested that I arrange to have a bone CT scanned by the Natural History Museum in order to have it 3D printed. A fragment of a horse scapula from the 500,000 year old site of Boxgrove in the UK has been suggested to possibly show damage from contact with a spear point, which might indicate that the horse that the humans systematically butchered with handaxes was first hunted with a spear. This is such an interesting possibility, and as I'm researching the earliest spears, the artefact has great significance for my research. One problem is that bones – particularly 500,000 year old ones – are often in a bad state, and very fragile. The Natural History Museum kindly CT scanned the scapula fragment for me and we had it printed in plaster at UCL last summer. This has enabled me to study the lesion on the scapula, but also to take it with me to conferences and pass it around, meaning that many people were handling an object in Spain that normally they would need special permission and a trip to the UK for!



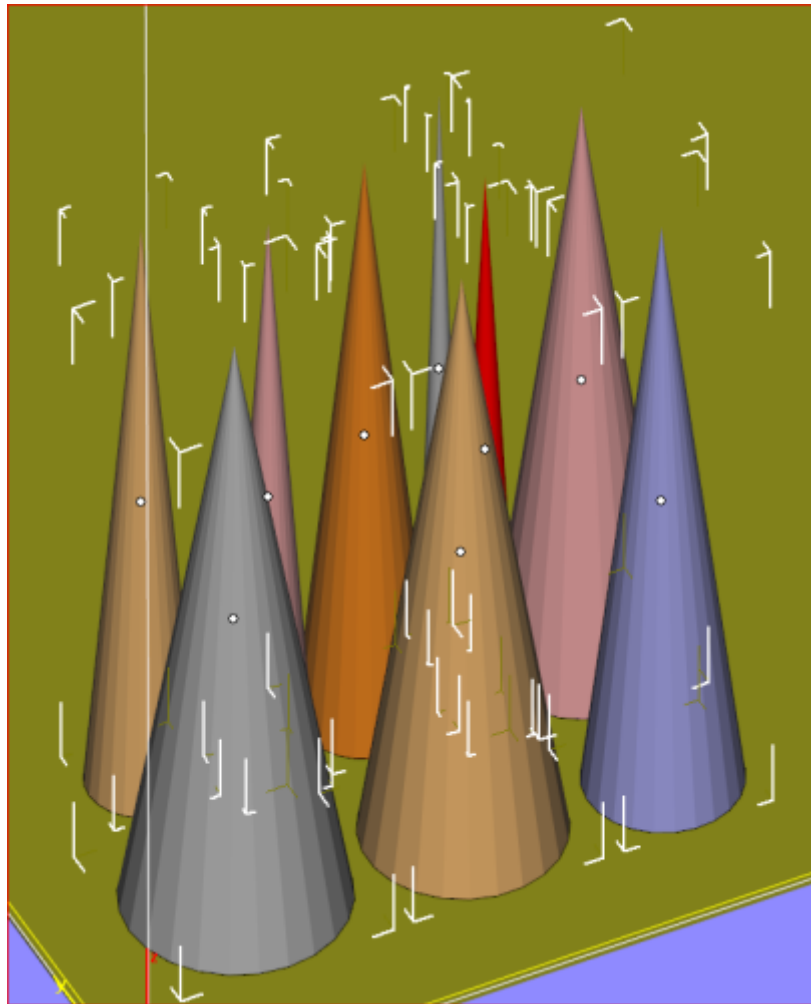
*CT Scanning the Boxgrove Horse scapula fragment at the
Natural History Museum*



3D print in plaster of the Boxgrove horse scapula

3D printing has so many possibilities in archaeology. UCL's Petrie museum is just one of many museums undertaking [3D imaging and printing projects](#) but there are lots of other possibilities too, including creating objects that other researchers, students and the public can handle, understand and discuss. Another example comes from [Harvard](#) where they've actually been able to reconstruct an object digitally using photomodeling, eventually reconstructing a sculpture that was smashed 3,000 years ago!

Today I'm working on designing an experiment using 3D printing, and I've just given the go-ahead to the printer. For my PhD, I'm looking at spears that don't have stone points, but are simply a wooden spear carved into a point at the tip. I've seen many different sizes of spears in my research so far, so I have a very basic question: how much does the size of the tip of a wooden spear affect how well a spear will work when used on an animal? So I've designed a series of cones using 3D modeling software (I was surprised how easily I picked this up and how fun it is – try out SketchUp for free!).



3D cones that I've designed to print in nylon for spear impact experiments.

These cones, each 100 millimetres long but with different diameters at the fat end, will be 3D printed over the weekend at UCL in nylon, a material that is robust, can be sanded down if necessary, and prints as small as 1 millimeter. Once I have my sample of cones printed I'm going to conduct a freefall drop impact test – which just means I repeatedly drop them down a 2 meter long tube into plasticine and see whether there are differences in how far they penetrate into the modeling clay. Will the thinner cones go into the clay more easily or not? Only the experiment, using 3D printing technology will help answer my question!