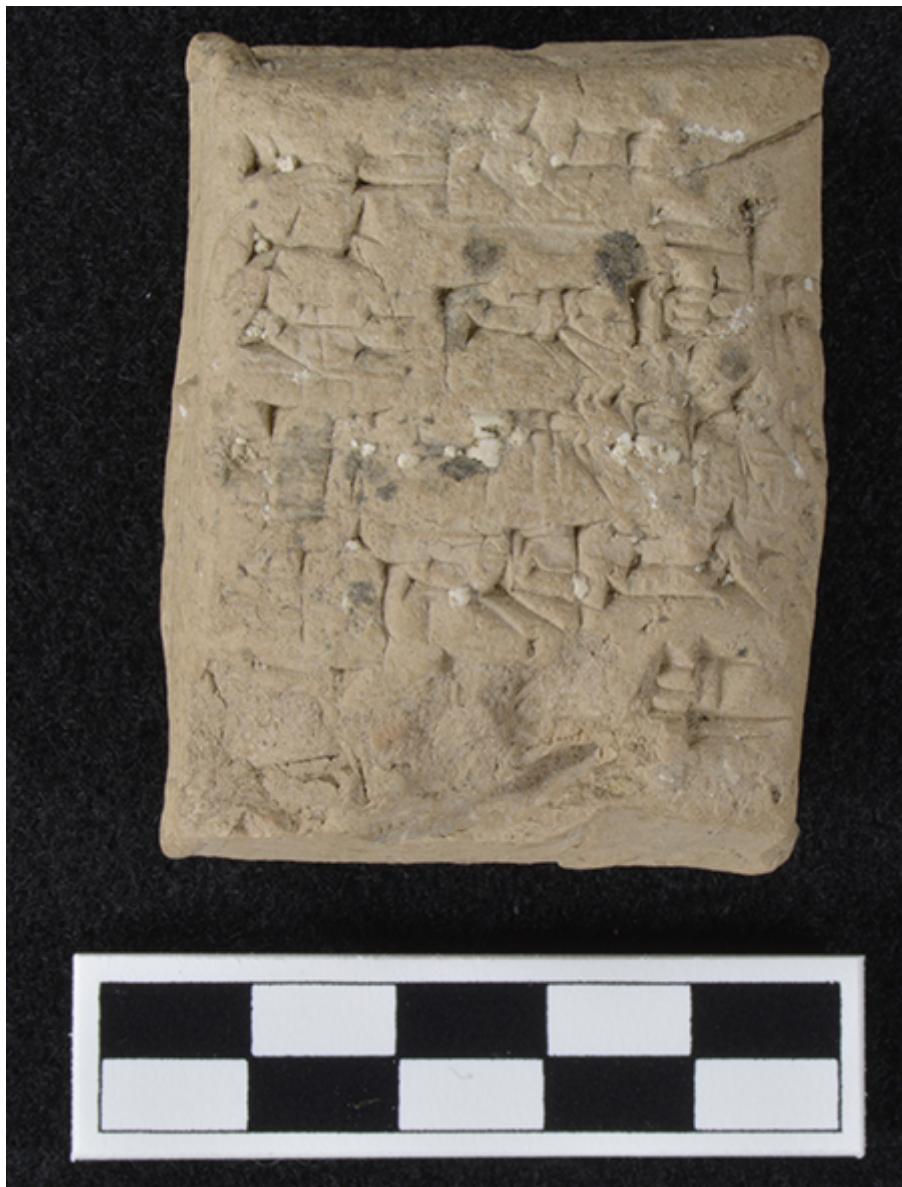


SUSTAINING THE PRACTICE OF ARCHAEOLOGY IN ONTARIO, CANADA

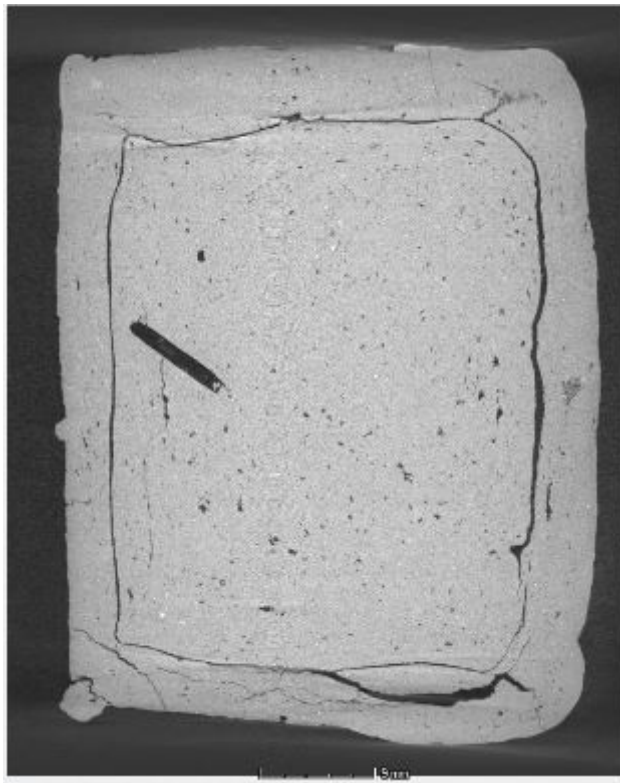
July 29, 2016 Rhonda_Bathurst Day of Archaeology 2016, Experimental Archaeology, Explore
Posts, Finds, Photography, Science 3D, digital archaeology, VR

This is our 3rd year participating in Day of Archaeology, and we are excited, once again, to be joining our colleagues in this virtual space to share with you some of the diverse experiences archaeologists have over the course of a regular day.

This year, we want to focus on the sorts of technology we have available here at Sustainable Archaeology: Western University. Most of the equipment in our new facility is for non-destructive image capture and analysis: 3D scanners, 3D printer, digital x-ray, microCT scanner, etc. We are fortunate, as archaeologists, to have a single location with dedicated access to equipment such as this! On any given day, several pieces of equipment will be in use by different researchers. Today, a couple of a staff members – Hillary and Heather – have been working on chipping away the outer “envelope” of a 3D printed cuneiform tablet to reveal the inner tablet for the first time in over 4,000 years! But to explain how we got to this point, let’s start from the beginning.

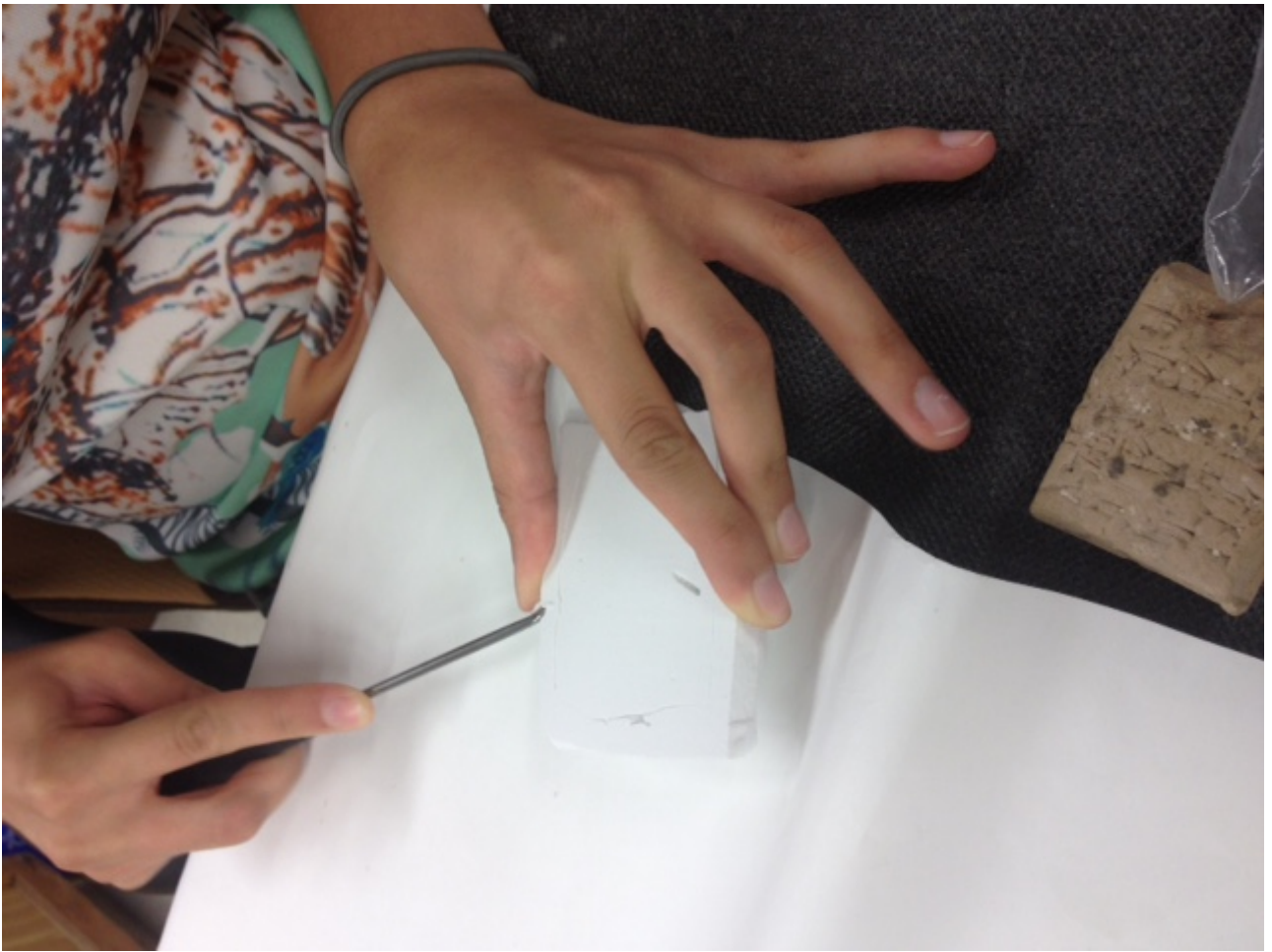


Sustainable Archaeology was built adjacent to the Museum of Ontario Archaeology in London, Ontario, Canada. The Museum houses a variety of collections, predominantly from Ontario but there are some international antiquities that were acquired by the mid-20th century curator of the Museum, including a small collection of cuneiform tablets. One of those tablets was suspected to be an Old Babylonian “envelope” tablet – a cuneiform tablet nested inside of a cuneiform tablet. But how to tell without breaking the tablet open? Sustainable Archaeology had a solution – we scanned the tablet in the microCT scanner. Sure enough, there was evidence that another tablet was enfolded within the outer layer of clay – and it appeared to have cuneiform writing on it as well!



With microCT imaging software, VG Studio, Hillary painstakingly ‘excavated’, or peeled-off, the outer layer of clay. This was a tricky process, because CT images differentiate material based on the density of voxels in a 3D dimensional space – metal, for instance, is much more dense and thus appears much ‘whiter’ than wood. But the clay ‘envelope’ was the same density as the enclosed clay tablet – so selecting which voxels to digitally peel-away from the region of interest was a labour intensive process. Hillary was able to do this because there was a slight void between the clay surfaces. This led us to an idea – if we 3D printed the tablet, would the void still be intact? In which case, wouldn’t we be able to break the outer tablet off of the inner tablet?

So for our second experiment, we did just that. We digitally cut the cuneiform tablet in half, so we could see the inside structure(s), and we printed off that cuneiform half on the 3D printer. Sure enough, the void was there – but it was very thin. In order to create more void space – an area that would be filled with printer powder but no binder would be laid down – we scaled up the size of the tablet to double its original size. Then we printed it off and got to work chipping off the external ‘envelope’ – to reveal a clear, sharp cuneiform surface on the embedded tablet. Success!



We are constantly envisioning ways that the equipment we have here at SA can complement one another. Colin is next door in the Collaboration Room with the Virtual Reality equipment. He is working on an application that allows us to digitally pick up, move, throw and stack digital assets that we've scanned on our 3D scanners (such as pots!) within a virtual reality space. This way, as you are immersed within a virtual reconstruction of a Lawson site longhouse, such as that created by Western PhD candidate [Michael Carter](#), while wearing a set of 3D goggles such as Oculus Rift or HTC Vive, you will also be able to digitally engage with objects within that virtual space.

For more information on what we do at Sustainable Archaeology, check out our website at www.sustainablearchaeology.org. You can also follow us on Instagram [@sustarchaeology](#) or Twitter [@SustArchaeology](#).