

Recent work in Southampton: the application of technology to the heritage of a city

This is a report of the lecture given to the society on 14th November 2023 by Kristian Strutt, Senior Teaching Fellow at the University of Southampton. He specialises in landscape archaeology, including surveys and geophysics.

Kris explained that his role included teaching archaeological fieldwork to under- and postgraduate students and gave a brief outline of the various techniques and equipment used. This included earth resistance surveys, ground penetrating surveys (GPR) and magnetometry. All of these could be used to see evidence that remained of objects/ buildings that had been destroyed. Most could be augmented using laser scanning and building surveys.

In summary, he explained that resistivity surveys were used to measure levels of high or low resistance by passing electricity through dry objects to determine what might be hidden from view. Magnetometry was used to view the subsoil and picked up differences caused by changes in the magnetism of things underground. Ground penetrating radar sent out radio waves which reflected off objects and tended to work in the high frequency end of the spectrum. The department had also received a grant to purchase a 360° laser scanner, which collected millions of datapoints, taking red, green and blue images which were then combined. While the initial reasons for doing this were for research and training students, other applications were continuing to be developed particularly in making heritage more accessible. This was seen at the recent Heritage Open Days, where, through scanning the image of a building, it was possible to see a 3D model of it.

Kris explained that pre-Covid many students had gone abroad to gain their fieldwork experience but everything was halted during Covid. By 2021, the department had 2 years' worth of students who needed to gain these skills and requirements such as social distancing meant that the logistics of this were more complex and costly. The department therefore focused on a series of local heritage projects, starting initially on campus.

Previous work on the Avenue Campus had identified the area where the tram sheds had been. This was surveyed and the remains of a WW2 air-raid shelter were identified near the tennis courts. Excavations were carried out and remnants of duck boards and sand from sandbags were found, together with some NAAFI pottery and neolithic flints. Magnetometry was undertaken on the Common and showed the location of army camps with drainage and the outlines of Nissan huts. The camps were from both WW1 and WW2 but had not been differentiated. At Bitterne Manor (Clausentum), a resistance survey of the parkland showed remains of the bath house, as well as where the jetty was located. In 2021, a number of trenches were dug and a possible well was located along with a few pieces of Samian ware and a small part of a roadway. A lot of Samian ware and amphora sherds were found nearby during the excavation of a back garden in Hawkeswood Road.



Further to these projects, there was increased interest from students in locally focussed work and there have been a series of projects to scan Southampton's medieval heritage. To date either laser- scanning or ground penetrating radar surveys have been carried out at the Bargate, Castle Bailey Wall, Holyrood Church, Tudor House, St Michael's Church, West Gate, the Weigh House and several vaults. Most recently, GPR surveying was undertaken at St Mary's School and St Mary's Stadium, covering part of the Hamwic area. The results of these latter are awaited.

By integrating the results of these surveys with existing plans and information it is possible to map and interpret the town layout. For example, the Castle Bailey Wall scan showed various buildings, including the 19thc Synagogue while Lankester's Vault scan clearly showed the wrap-around of the barrel vault and was detailed enough to show the masons' marks on the stonework. The Bargate scans showed profiles through the structure which could now be compared to earlier plans to confirm the different building phases while, at St John's Primary School, a Tudor cistern was identified under the playground. Kris noted that these techniques also have a role to play in the maintenance of heritage, helping to identify the current state of repair in areas of St John's Palace and Conduit House.



The need to take multiple scans during laser scanning, with a 50% overlap in the pictures taken and the elevation details recorded was stressed so the outputs were complete and could be aligned. Kris explained that for all the survey techniques discussed, there was a lot of post- survey data processing, using different software to allow analysis of results. From laser scans it was possible to produce plans of buildings, very detailed pictures, 3D models and traditional elevation models. An example of a laser printed 3D model of the Tournai font in St Michael's Church was shared at the meeting.

Kris noted that the range of uses of these techniques was still being developed but highlighted that the educational role was not

3D model of Tournai Font. Photo: Julian Porter

only for students but to help make heritage more accessible to everyone, through use of online resources. It was also important to consider the techniques to use and not to do something just because you could. He reported that a number of objects were available for people to look at in 3D via 'Sketchlab' on the museum service website. A recent survey by the Council on people's views about the site showed a high interest in archaeology and seeing the scans of local buildings and vaults.

Discussion:

Kris confirmed that graffiti could be picked up through different techniques and the key was deciding which was the best to use for what you were trying to achieve.

While some 3D models were being produced, Kris confirmed that there was still much experimenting to be done with the use of 3D printers in this context.

There was a query, re the value of using any of these techniques for a site in Cuckoo Lane. Kris confirmed it would be possible to look at it and record it but did not think it would produce anything much different to having an archaeologist review it.

A further area for use of these surveys would be to compare the results of surveys undertaken at different points in time to compare any changes over time to guide maintenance/ repair.

With thanks to Mandy Kesby for her detailed notes

Sue Davies
Dec 2023