

LIDAR, 3D and exploring history – *Stephen Littlejohns* (March 2019)

After a brief AGM we enjoyed a most unusual talk which opened up areas of research that were new to quite a number of us. Steve described and demonstrated three technology-based approaches to history and archaeology which offered new understandings of historic landscapes and structures.

LIDAR (Light Detection And Ranging) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. Up to 100,000 measurements per second are made of the ground, allowing highly detailed surface and terrain models to be generated at different spatial resolutions. The resultant images can be software-manipulated to enable the terrain to be viewed from different angles, different heights or under varying light conditions (i.e. with shadows shown in different directions). Of particular use is the ability of LIDAR to 'remove' surface features such as vegetation or buildings and reveal the actual ground surface. In this way features can be made out which would remain hidden on a conventional aerial photograph or map or remain invisible to the naked eye on the ground. Steve showed this to particularly good effect in the Clyne valley where LIDAR revealed runs of bell pits and provided an accurate indication of the extent of the spoil tips of Rhydydefaid and Commercial collieries.

LIDAR data can be viewed freely on a Wales government web site (lle.gov.wales) and the software with which it can be manipulated is also freely available. But it needs to be remembered that not every part of the country has been covered at every resolution, so in some cases one may find that only a comparatively low level of resolution is available.

Another tool with great potential historical value is Welsh Government Historic Aerial Photography which is also freely available through the lle portal. Free software needs to be downloaded. This service provides access to high-resolution aerial photographs dating from 1945 onwards. Again taking his example from Clyne valley, Steve showed a number of views of the Clyne valley brickworks. This is particularly valuable since only a very few surface photographs are known to exist, none of which make the layout and function of the works as clear as these aerial photographs.

Finally Steve showed some virtual reconstructions of historic building and constructs which he had made or was working on, including the Mumbles Railway trainshed, a Clyne Valley Colliery coal wagon, Blackpill Mill, Landore viaduct and Singleton Abbey as it was in about 1850. Projects such as this can recreate detail which has been lost and in sequence can form a valuable way of understanding the various stages in the evolution of a building which has been repeatedly altered during the course of its history.