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Introduction
The UCD School of Archaeology in collaboration with archaeological geophysical consultant Ian Elliott carried out geophysical survey at the Glendalough ‘Monastic City’ in August 2011 and August 2012. This has allowed us to identify previously unknown archaeological features beneath the ground surface. Remarkably, this is the first geophysical survey at Glendalough, and the results make a substantial contribution to our understanding of the site and will inform future research and the management of this iconic landscape.

Results
The survey around the main monastic complex demonstrates the presence of numerous geophysical anomalies, many of which are most likely of archaeological significance.

The most striking features are to the west of the main monastic complex, where two ditches (E and F) are present. Ditch E is broadly parallel with recent field boundaries, and may be also be of recent date. Ditch F is curving and very substantial, measuring up to 10 metres in width. The combination of earth resistance and magnetic surveys here provides some evidence to suggest that the sides of this substantial ditch are lined with stones and this may be one of the main boundaries of the Monastic complex. A further feature (G) may be another ditch or boundary, enclosing an area to the southwest of the main enclosure ditch.

Further to the southwest there is evidence of intensive burning (M) possibly associated with buildings (N). There is no evidence of ferrous

Outline of Methods
We used two main forms of geophysical survey at the Monastic Site at Glendalough: earth resistance and magnetometry.

Earth resistance survey measures the resistance of the soil to an electric current, in effect measuring the moisture content of the soil. This will be affected by the presence of stones or different soil types – so structural features or buried ditches appear as variations in the resistance data. These variations are often called ‘anomalies’.

Magnetometer survey looks at very subtle variations in the magnetic properties of the soil. This can identify different soil deposits which may relate to structural features such as ditches, areas of burning and of course, metals.

Both types of survey take place within a grid system which is fixed to the national grid, allowing us to confidently identify the location of anomalies. Not all anomalies are archaeologically important: some relate to modern rubbish while others some may relate to natural geological features. The yellow dots on the interpretation of the survey indicate the ‘noise’ provided by ferrous materials.
Processed 2011–12 Earth Resistance data showing results of surveys around the main monastic complex, Our Lady's Church, St. Kieran's Church and Seven Fonts.
Fluxgate Gradiometer data showing results of surveys around the main monastic complex: Our Lady's Church and Seven Fonts.
In the northwest of the area surveyed two smaller curvilinear features (C and H) are present. These may represent an earlier circular enclosure, now heavily eroded.

Several buildings, and many more possible buildings, are indicated in the survey. Anomaly ‘b’ is a large rectangular hall, c. 13 x 20m. It is possibly a Medieval building.

Work in 2012 focused on two new areas: the ‘Pattern Bank’ and the Seven Fonts. The Pattern Bank lies between the main monastic complex and the road along the Glendasan River to the north. Survey here has demonstrated the presence of a building and possible graves. The building may relate to the location of a tea-room that stood on this bank up the 1950s.

Survey of a very small area surrounding the Seven Fonts north of the monastery on the other side of
Interpretative plan of the 2011-12 geophysical surveys showing suggested archaeological features. F, curving monastic ditch; C, G, H, possible earlier circular enclosures; E, G, boundary ditches; M, possible metal or kiln works; N, G, J, building are discussed in text.
Students conducting the earth resistance survey on the Pattern Bank to the north of the round tower in 2012. This the area in 'McCoy's Tea Rooms' were located in the min-twentieth century.
the Glendasan River was especially interesting. The Seven Fonts are bullaun stones (stones with a well defined hollow worked on their upper surface), and recent arguments have suggested that these played a role in early metal working processes. The results of the 2012 survey demonstrate the presence of large masses of ferrous material immediately adjacent to the bullauns. Further survey and excavation is required to establish the nature of this material, but it is an exciting link to the metal working hypothesis.

Discussion

The geophysical survey of the area surrounding the monastic complex was a great success and has demonstrated a range of features, including some of potentially high archaeological significance. The identification of a possible boundary of the monastic city, as well as industrial activity taking place outside of this boundary, and buildings that appear to relate to these features, may be significant in understanding the organisation of space in the medieval period at Glendalough. The presence of a possible earlier enclosure is also notable and would repay further attention. Testing of these geophysical anomalies by archaeological excavation is required and will contribute very significantly to our understanding of the development of this landscape. Beyond the research questions raised by this survey, it is also important to stress that this will greatly facilitate management of these internationally significant landscapes.

Acknowledgments

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