Hod Hill Reappraised – A multi-method geophysical analysis to assess the effects plough damage and implications for the investigation of hillfort settlement zonation using magnetic methods.

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Amongst the many hundred Iron Age hillforts in Britain, Hod Hill (Dorset) is special not only because of the Roman period fort occupying one corner, but also for the important research opportunity the 22 hectare site presents. Much of the interior suffered the depredations of Victorian ploughing, leading Sumner, writing in 1913, to describe the interior of Hod Hill as **"**too much wasted by cultivation for definite survey". Further wartime episodes of ploughing exacerbated this situation, but one quadrant of the interior has remained untouched, giving us an unparalleled opportunity to use geophysical methods to study the condition of archaeological remains before and after severe plough damage.

This multi-method study looks at a sample area that spans the ploughed and unploughed zones. Fluxgate gradiometry, twin-probe earth resistivity, topsoil magnetic susceptibility, electromagnetics and GPR were employed to allow a comparison of the signature of remains and assess the ability of each of the methods to detect them. The results are not all as expected from the textbooks. The shallow ploughsoil is choked with flint and chalk rubble causing surface noise and the features mainly negative, yet the GPR produces clearest images (fig.1).

A) 6.84 nanoseconds B) 10.72 nanoseconds

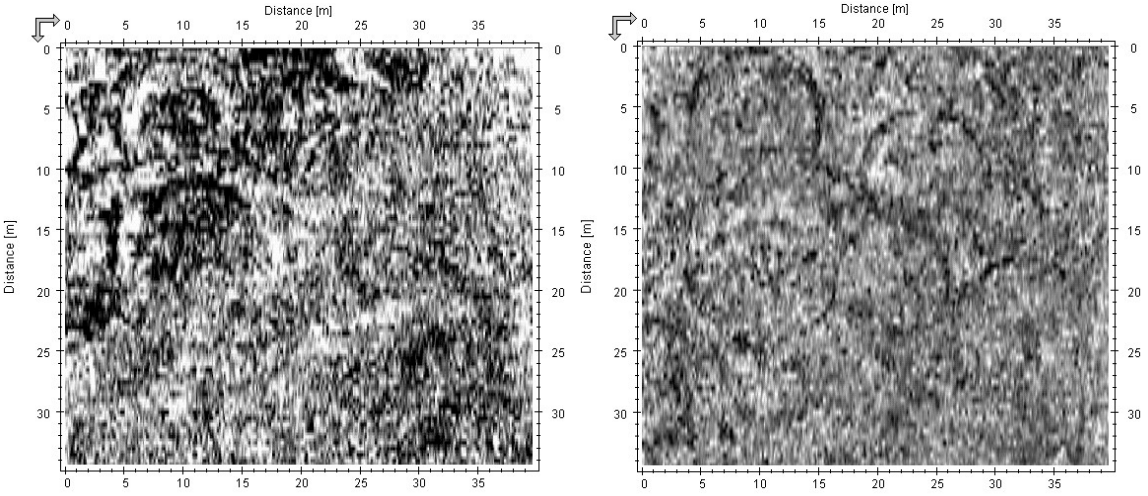

Figure 1: Radar horizontal slices

The earth resistivity results are good for a chalk site in summer and the electromagnetic survey delivers interesting comparative data for its four sets of data. The discovery of a smithy area within the survey area is an added bonus.

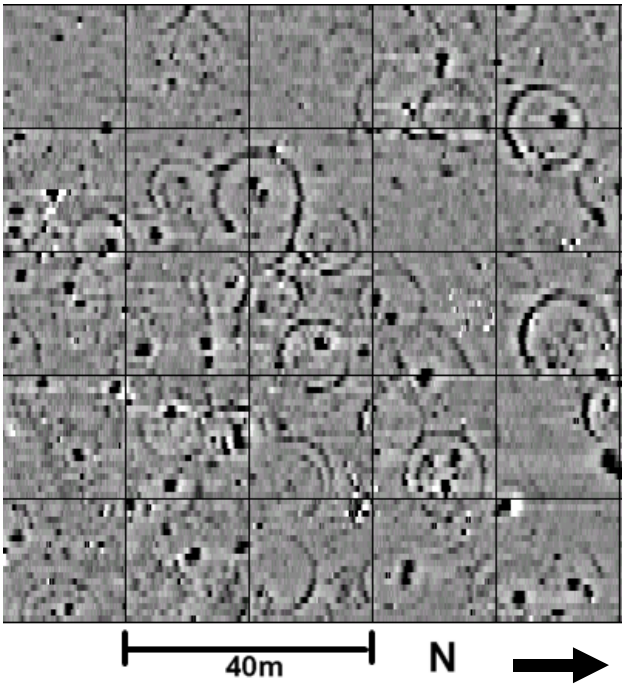

Figure 2: Sample of detail

To put the plough-damage study in context a wider gradiometer survey was undertaken which rapidly expanded and by September 2005 had covered over 14 hectares with the remaining third completed in 2006. The results of the geophysical survey proved Sumner wrong. Excellent responses from cut features reveal a wealth of detail (fig.2). Habitation is extensive across the site, including several enclosed structures that hint at social hierarchy. Dwellings respecting the Roman earthworks and the absence of a road from the supposed Roman gate call for a reappraisal of the conquest scenario proposed by Richmond fifty years ago. The dendritic trackways can be clearly seen, some leading to industrial areas.

The junction of two trackways was resurveyed at higher resolution (fig.3) showing a line of post-built structures and re-opening debate as to their purpose.

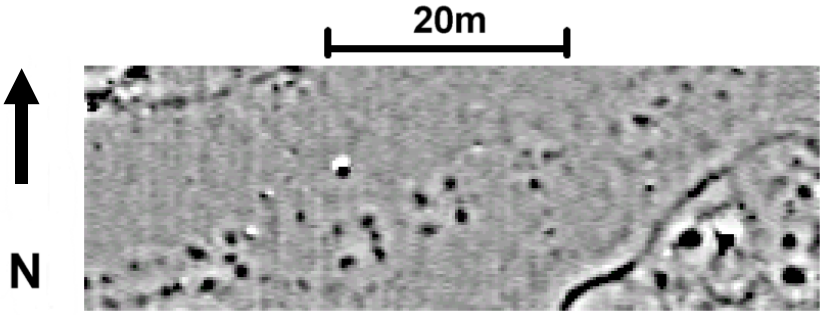

Figure 3: Junction of Trackways

While the images indicate the excellent response of the site to magnetic methods, the north eastern part of the hillfort failed to produce the magnetic responses found in the southern two thirds. The question of whether this was a vast open space, as the fluxgate gradiometry survey suggested, needed to be tested. Again, GPR was shown to be by far the most effective method employed, showing that despite the lack of magnetic responses the density of structures in this area seems to be as intense as it is to the south. These results highlight potential issues in relying on only gradiometry results when studying settlement zonation in this class of monument.