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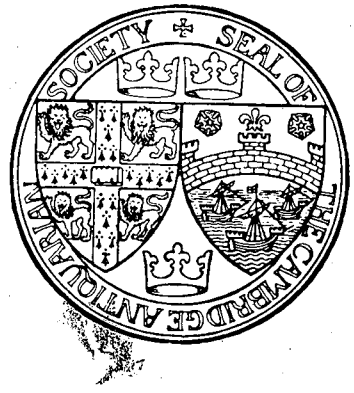

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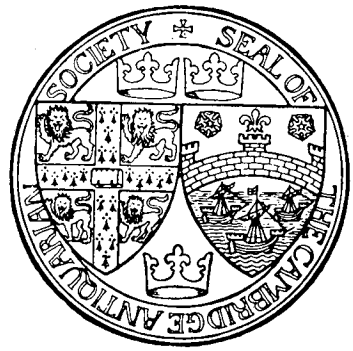

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ANGLESEY ABBEY – A RESISTIVITY SURVEY EXERCISE

DAVID TRUMP

In volume LXXIV of *PCAS*, K.R. Dark (1985) reported a survey of Sidney Sussex College, Cambridge, by means of resistivity, designed to locate the missing buildings of the Franciscan Friary. An eminently suitable site for like treatment was Anglesey Abbey, 5½ miles north-east of the city. With the active encouragement of M. Waterson, Regional Officer for East Anglia of the National Trust, who now own the site, and the cooperation of their administrator, G. Moran, four mornings with a Martin-Clark resistivity meter were devoted to the survey in August 1988. I am particularly grateful to Tony Baggs for his assistance.

The present house (RCHM, 1972, 74) contains the only surviving fragments of the monastic buildings, though it is uncertain what their original functions were. Still less is known of the other ranges of building there must have been at the time of the dissolution, in particular the abbey church, all of which have been swept away without trace (Figure 1). Tony Baggs (pers. comm.) observes that

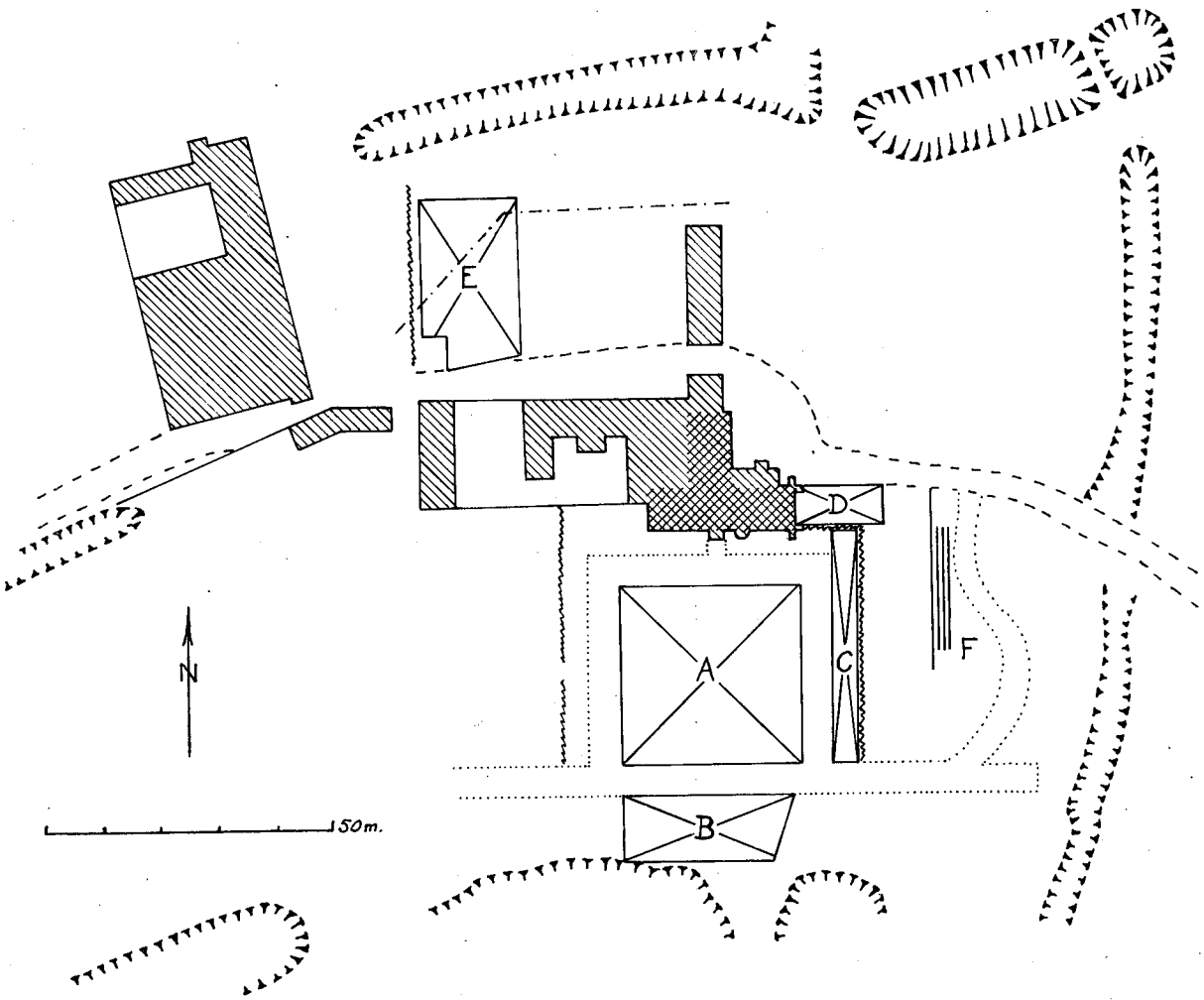

Figure 1. Anglesey Abbey, site plan.

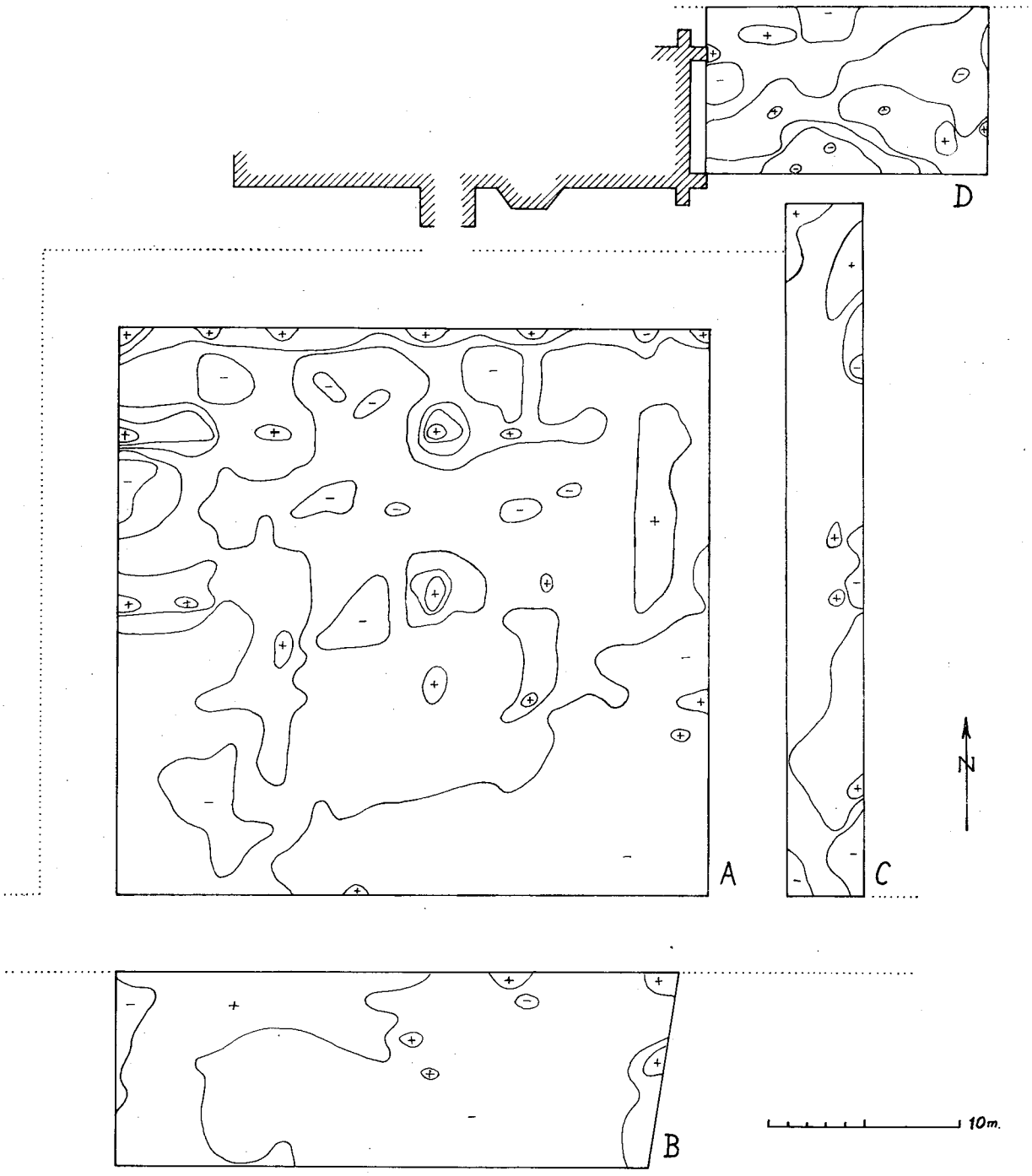

Figure 2. Lawns south and east of house, contoured for resistance.

the buttresses on the present building imply that further monastic structures must have lain to the north and west. There are reports of parch-marks appearing in the lawn to the south of the house in exceptionally dry summers, but no record of the pattern they make. The buttresses further suggest that any building in this area must have been free-standing, an infirmary perhaps. An attempt to recover at least some of the missing plan seemed eminently worthwhile.

The survey of the south lawn was carried out at 1 m intervals using the twin-electrode configuration. In this, two probes are inserted in the ground approximately 2 m apart, not less than 30 m distant from the nearest point of

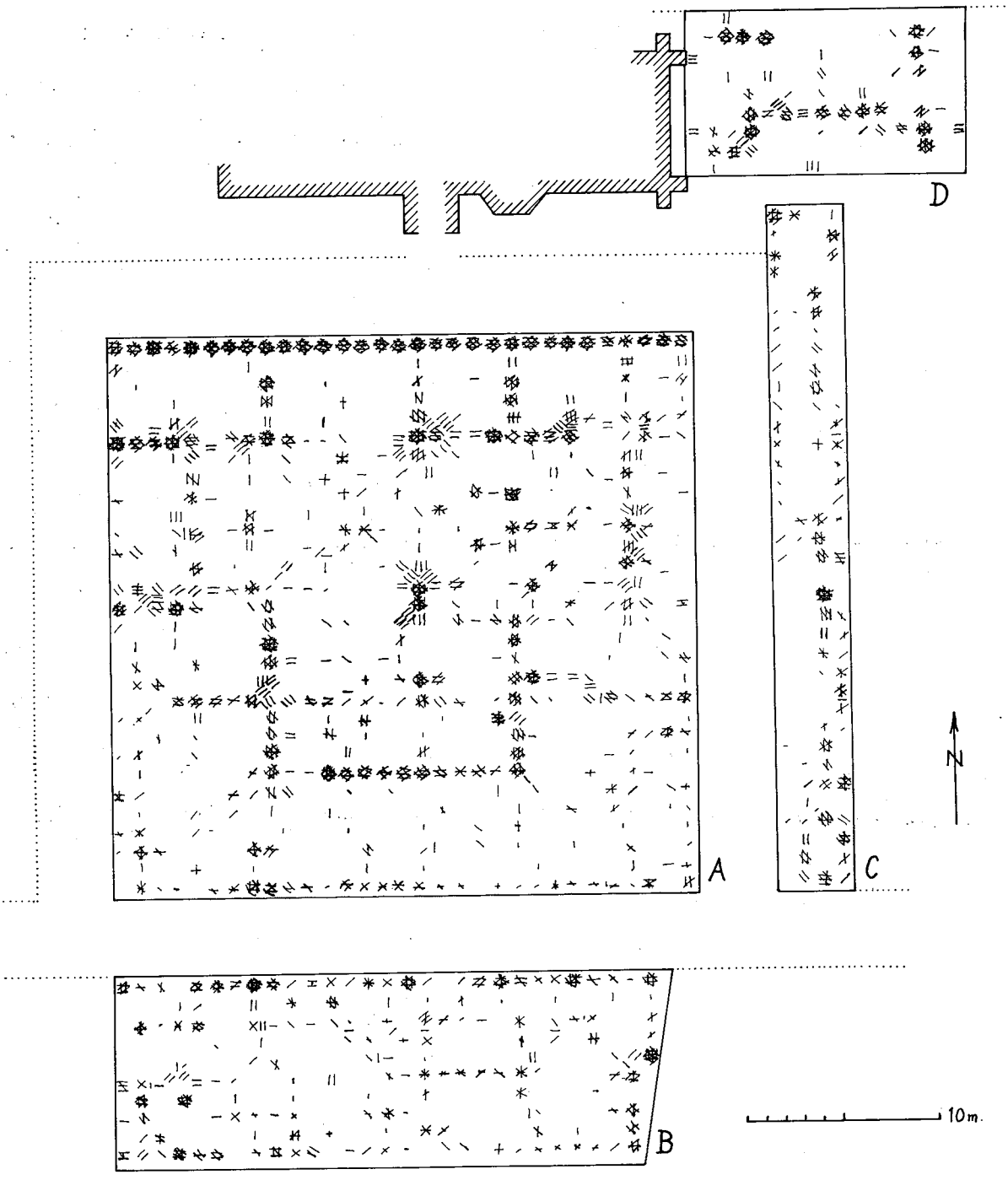

Figure 3. Lawns south and east of house cross-dashed for high resistance.

the survey area. The other two are then moved alternately across the area to be gridded, separated by a constant 1 m. When a small current is passed between the probes, the figure recorded by the meter has no meaningful value in itself, but variations in a row of readings give a rapid and effective measure of the differences in electrical resistance of the ground, and so of high-resistance features like wall foundations, or low- resistance features like infilled ditches, depending on a lower or higher moisture content compared with the surrounding soil.

This survey gave some 900 readings with a satisfactorily wide spread, from 108 to 207. The next stage was to convert these into a

visually understandable form for interpretation. At Sidney Sussex College, graded shading was employed, but at Anglesey Abbey, contouring produced no clear pattern (Figure 2). However, inspection of the figures showed that there were lines of higher readings, even if contouring failed to emphasize them sufficiently. Instead, then, a formula was devised whereby a short dash was marked over any figure which exceeded by one both its immediate neighbours in a straight line, whether orthogonal or diagonal, and at right angles to that line. If it exceeded both those neighbours by 2–4, the short dash was replaced by a long one, by 5–9 two long dashes, by 10 or more three long dashes.

An additional rule had to be made to cover the situation where a line of high readings passed between two figures instead of over one, since neither, because of its high neighbour, would qualify for its dash or dashes. Here a corresponding mark was made between the two if each of these two exceeded its outer neighbour by the usual figure. A second extension of the rules covered the 'border effect', where a figure on the edge of the grid could not score since it had only one neighbour to be compared with. Here the same rule was applied, but only if a figure topped its single neighbour by twice the usual margin. This preserved some information which would otherwise have been lost, as will become apparent below.

Plotting the south lawn figures in this way gave the result shown in Figure 3. In this, a very marked 'lininess' becomes apparent, which will receive further discussion below. That this is a significant variation is demonstrated in two ways. When the survey was extended beyond the path to the south (the packed gravel prevented probe insertion in the paths themselves), the 'lininess' was far less evident beyond the first row of readings beside the path. Even simpler was to reverse the plotting over the south lawn, i.e. to mark in the same way not those figures greater than, but those less than, their immediate neighbours (Figure 4). Here too, although there is still a trace of lines, they are much less emphasized. In other words, there are features producing rows of higher resistance figures, but not, or at least to a much lesser extent, ones producing rows of lower figures. This too will be reconsidered below.

The strip of lawn to the east was covered next, but allowed of only four rows of readings, too few for meaningful patterning to emerge. For the same reason, the even narrower strip immediately beside the wall of the house was not attempted.

An extensive area was also available north of the house, despite its being planted up as an

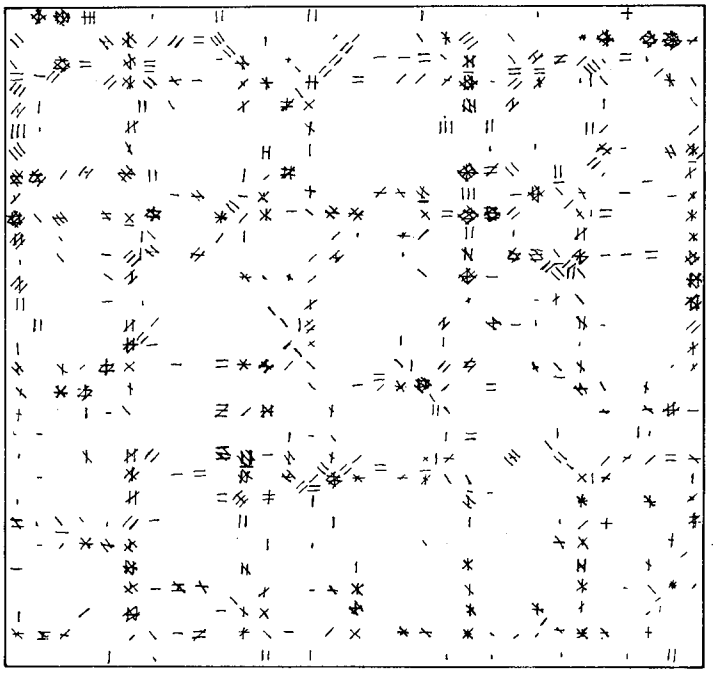

Figure 4. South lawn cross-dashed for low resistance.

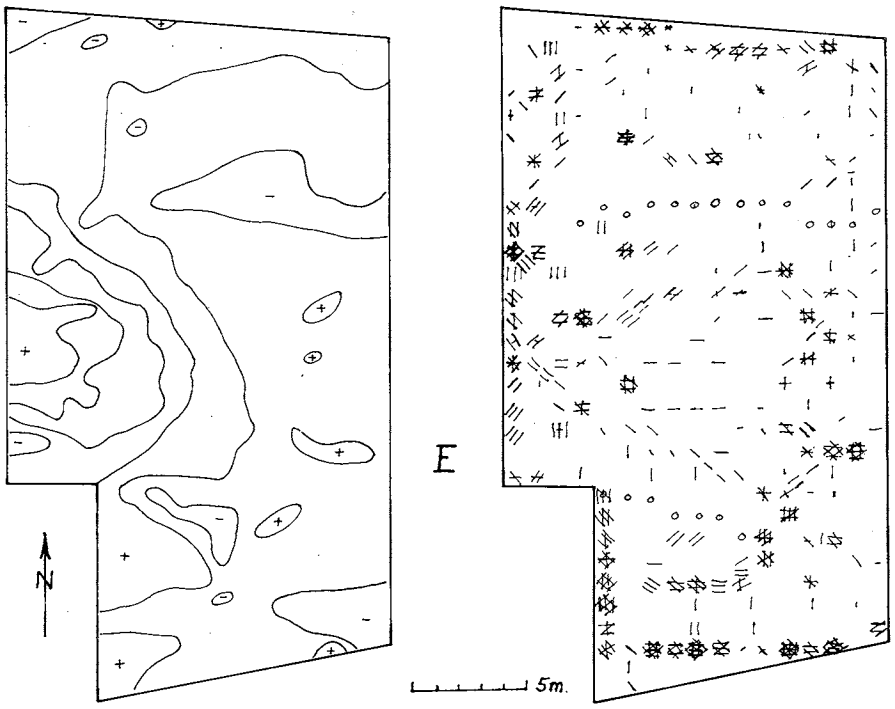

Figure 5. North orchard contoured and cross-dashed for resistance.

ornamental orchard. Here contouring highlights a major block of high resistance on the west side, though 'peak-dashing' as described above showed little of interest. However, two east–west lines of low resistance, marked on Figure 5 by rows of small circles, suggested levelled ditches or the like. The eastern half of the orchard area was not surveyed, for reasons described below.

The small lawn to the east of the house, on the south side of the drive, was covered next, yielding 13 readings by 9. Though 'lininess' similar to that of the south lawn can be detected, the area is again too restricted for any pattern to be clear. It is unfortunate that the yew hedge prevented readings being extended to the south to join up with areas there.

Finally, an attempt was made to sample the wooded area to the east, a likely place for major buildings, perhaps even the church. Four simple traverses were recorded using four equi-spaced probes. By comparing A–B with C–D, and A–D with B–C, two figures were obtained at each sample point. The first, the Wenner configuration, should give a double hump over a significant feature, as the successive pair of probes cross it. The second, or double dipole configuration, gives a single but lower one. By superimposing the two lines, a distinctive signature should emerge, A over M, a single peak over a double representing high resistance, or V over W, single trough over double, for a low-resistance feature. Several can be recognized in the readings, Figure 6, but not consistently between traverses, so again the results were inconclusive.

The big cedar trees here not only impeded the survey, but imposed their own pattern of higher resistance, both by shading from rain and by removing groundwater through their root systems, thus obscuring any underlying pattern of archaeological significance.

Thus far, only three areas surveyed showed detail of possible interest. One of these, the north orchard, can also be eliminated. On our return to complete its eastern half, it was found that a trench had been cut to take piping along its northern edge, then diagonally across the area already surveyed. No wall foundations were visible anywhere in its sides. The very prominent area of high resistance on the west side of the plotted area was revealed as a major scatter of post-medieval building debris, probably associated with the block of building to the immediate west. It had nothing to tell us about the site during its monastic occupation. Secondly, on the east–west line of low readings there came to light not the

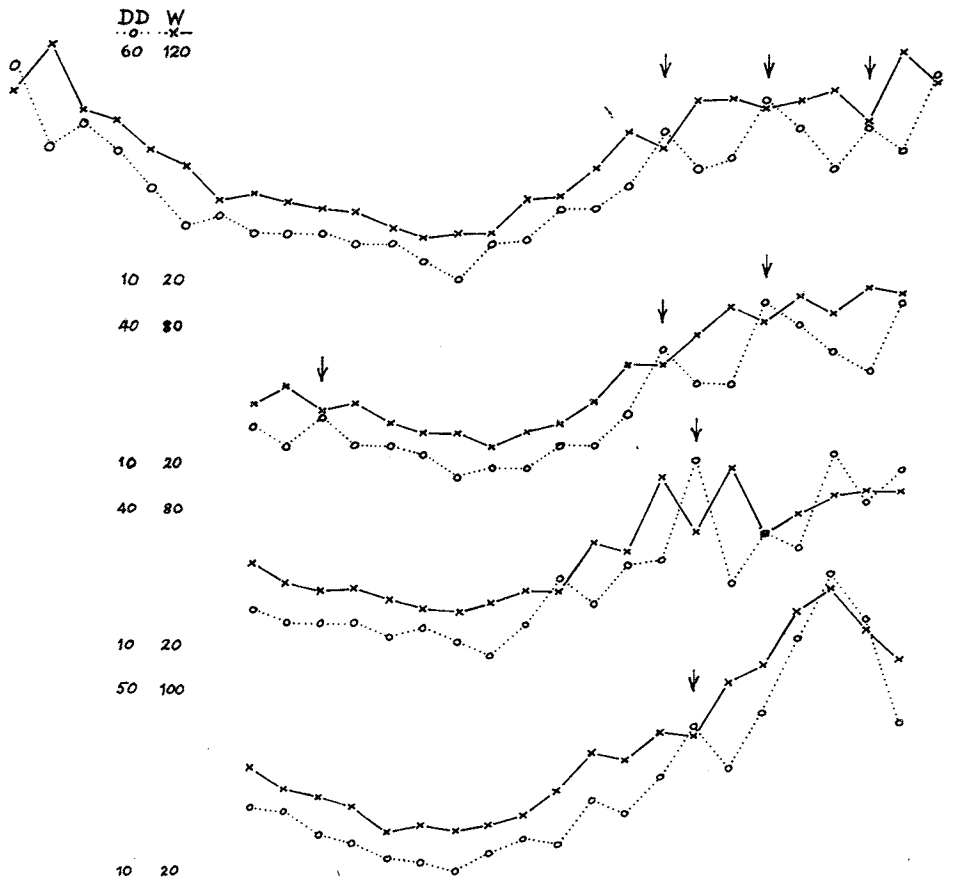

Figure 6. Traverses in wood to east. Arrows indicate possible wall lines.

expected re-filled ditch but a buried steel multi-strand cable or hawser. Why it should have been deposited there is not clear, but no further explanation for the low resistance was called for. In view of these negative results, the eastern half of the orchard was abandoned.

The main lawn south of the house requires a much closer look. The most prominent feature is the row of very high readings along the northern edge, which would have been lost but for the second additional rule explained above. This is not simply the influence of the gravel path beside, since the eastern and western edges show no trace of it, and the southern to a much less marked extent. On the contrary, the eastern and western edges are emphasized on the low resistance plan, Figure 4, perhaps as the result of surface drainage off the gravel.

The relief at the northern edge of the lawn, however, suggests that the path here was once wider than at present. A former gravelled surface now beneath the turf would readily explain the higher figures. The same could apply to the southern edge of this lawn.

The two highest readings out in the lawn, most apparent from the contoured plan Figure 2, are suspiciously in line with the main door of the house, though not precisely centred on the lawn. Though this could be coincidence, it might suggest some former garden ornaments – statue, sundial, birdbath, something like that – and so eighteenth century or later rather than sixteenth or earlier.

There remain the clear east–west and north–south lines of Figure 3, here and beside the drive. These do exist, so we are one stage beyond a 'canals of Mars' situation, but only one. It is possible to read practically anything into these, even a cruciform church, but it would be wiser not to attempt any ambitious reconstruction. The best conclusion is a more modest one, that they do represent former buildings in this area, presumably of the monastic period, and contrasting with the other areas surveyed to north and south. A

further survey under different weather conditions might reveal clearer detail, though there is no assurance of this. Any opportunity offered by drought to 'develop' parch-marks should be exploited by recording, if they are not prevented by artificial watering for the sake of the magnificent sweep of lawn. It would be very difficult to justify a final test by excavation.

The fact remains that the detectable survival of former buildings will depend on a number of highly variable factors, and cannot in any way be guaranteed. The major ones will be the nature of the underlying natural deposits and of the original foundations, the extent of their destruction, the material used to refill any robbing trenches, the moisture content of the deposits, and the superimposition of later features, natural or artificial, which could overlay or obscure the pattern of the period of interest. For all these reasons, that pattern is likely to be severely damaged, making interpretation even at best difficult. Resistivity may be, indeed is, a cheap and simple method of investigation, well worth trying in suitable circumstances, but a measure of luck is also required if results of value are to be obtained.

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