The Antonine Wall

Papers in honour of Professor Lawrence Keppie

edited by

David J. Breeze and William S. Hanson

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Cover illustrations
Front: The Distance Stone of the Twentieth Legion from Hutcheson Hill (*RIB* III 3507) found in 1969 lying face down in a shallow pit immediately to the south of the Wall (copyright Hunterian, University of Glasgow). **Back**: Restored half-life-sized statue of the Roman god Mars from the annexe of the fort at Balmuildy (*CSIR* 129) (copyright Hunterian, University of Glasgow).

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Lawrence at Westerwood. Photo the late Margaret J. Robb

Dedicated to the memory of Margaret Robb (1952-2017)

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15. The Roman fort and fortlet at Castlehill on the Antonine Wall: the geophysical, LiDAR and early map evidence

William S. Hanson and Richard E. Jones

Introduction

The Roman fort on the Antonine Wall at Castlehill, East Dunbartonshire (NS 5250 7270) is located immediately to the west of Bearsden on the northwestern fringe of Glasgow. It sits partly astride the eponymous Castlehill, where the Wall makes a marked change of alignment. This it does with some frequency in the sector west of Balmuildy as it makes its way from drumlin to drumlin. The hill rises to a height of 118m above sea level, providing excellent panoramic views, second only to Bar Hill along the whole line of the Wall (Macdonald 1934: 170).

There is a long antiquarian tradition of a Roman fort on the hill dating back to the beginning of the 18th century (Keppie 1980). In the mid-1750s the fort was still sufficiently extant for its outline to be planned by Roy (1793: plate XXXV) (Figure 15.1). By the mid-19th century, however, it had been

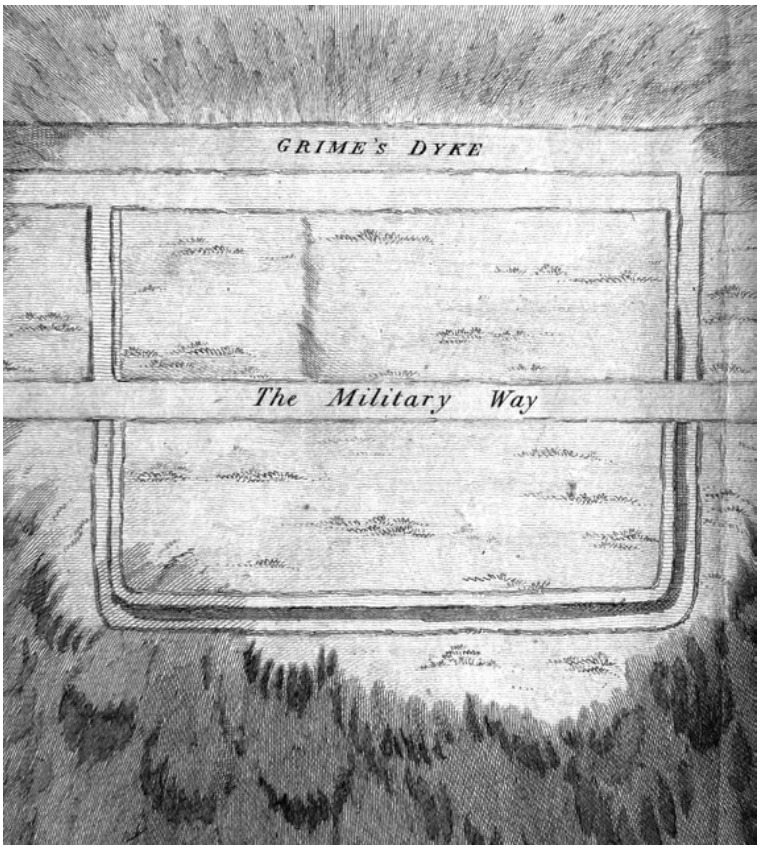

Figure 15.1. Roy's plan of the fort at Castlehill showing a smaller enclosure in its north-west corner (Roy 1793: pl. xxxv)

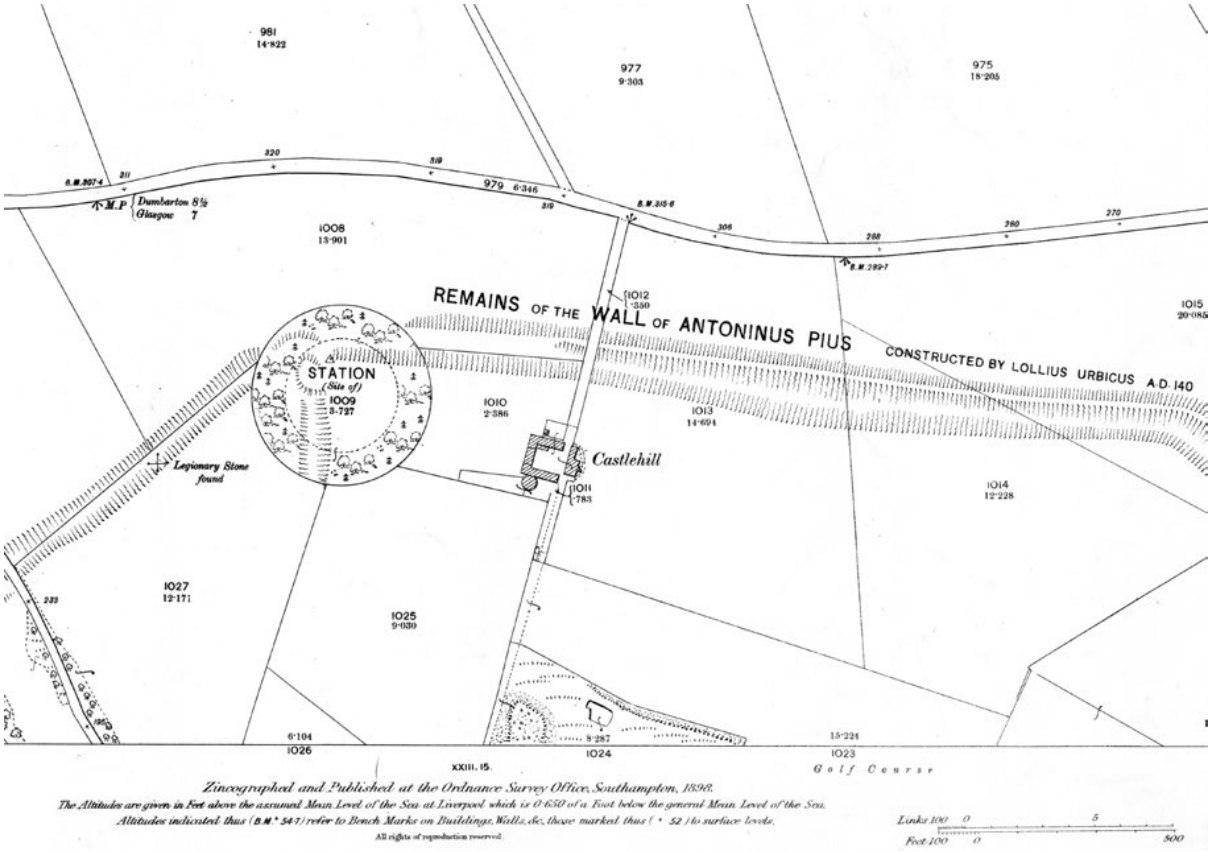

Figure 15.2. Extract from Ordnance Survey 2nd edition 25 inches to the mile map, Dunbartonshire sheet XXIII.11 (Reproduced with the permission of the National Library of Scotland)

largely ploughed flat and overplanted with a circular copse of trees, so that it features on the first edition 25 inch to the mile Ordnance Survey map of the area, surveyed in 1860, only as the 'site of a Roman station', though the line of the Antonine Wall ditch was still clear. In the second edition of the same map, published in 1898 (Figure 15.2), the line of the ditches defining the western side of the fort are recorded as a broad hollow, but this feature does not appear in any map revisions thereafter. Confirmation of the identification of the fort came in the early-19th century with the discovery nearby of an altar to the goddesses of the parade ground, dedicated by the commander of the Fourth Cohort of Gauls, and, some 20 years later, a probable tombstone and a decorated column capital (*RIB* I 2195; *CSIR* 144; 147). However, it was not until 1947 that the extent and precise location of the fort was confirmed, when its ditches on the south side and at the south-east corner were recorded from the air, indicating an area within the ditches of *c.* 3.5 acres (1.4 ha) (St Joseph 1951: 61-62; Keppie 1980: 82-83). No excavation has ever been undertaken, but Antonine pottery has been recovered from the roots of fallen trees on the hilltop (Robertson 2015: 114).

This confirmation of the size and location of the fort highlighted two issues. Firstly, it was considerably larger than most of the antiquarian accounts seemed to indicate; secondly, it was not centered on the hilltop, but extended down the relatively gentle slope to the east almost as far as the now derelict Castlehill Farm (*contra* Macdonald 1934: 326). Lawrence Keppie examined the antiquarian accounts in detail and drew attention

to inconsistencies in the recorded dimensions of the fort. He concluded that these were the result of two installations being present on the same site, as, indeed, was depicted by Roy (Figure 15.1). In the context of contemporary understanding those seemed best interpreted as a fort with a fortlet approximately 30 m square located by its north-west corner on the summit of the hill (Keppie 1980).

Geophysical survey – aims and methodology

Since so little was known about the fort and no excavation had been undertaken, Castlehill seemed an ideal site for geophysical investigation. All the more so as there was the possibility of testing for the possible existence there of another fortlet. Accordingly, following a full topographic survey, three programmes of geophysical survey were undertaken in 2008, 2011 (Jones *et al.* 2009; Jones 2011) and 2019 with the aim of covering as much of the fort as possible by at least one form of survey, within the constraints of some difficult modern land conditions (below).

The first programme involved both resistivity (Figure 15.3) and magnetometry (Figure 15.4) across the northern two-thirds of the fort. The second was confined to higher resolution magnetometry which

Figure 15.3. Location plan of the resistivity surveys. The main survey to the north was undertaken in 2008; the coverage of the southern defences was obtained in 2019

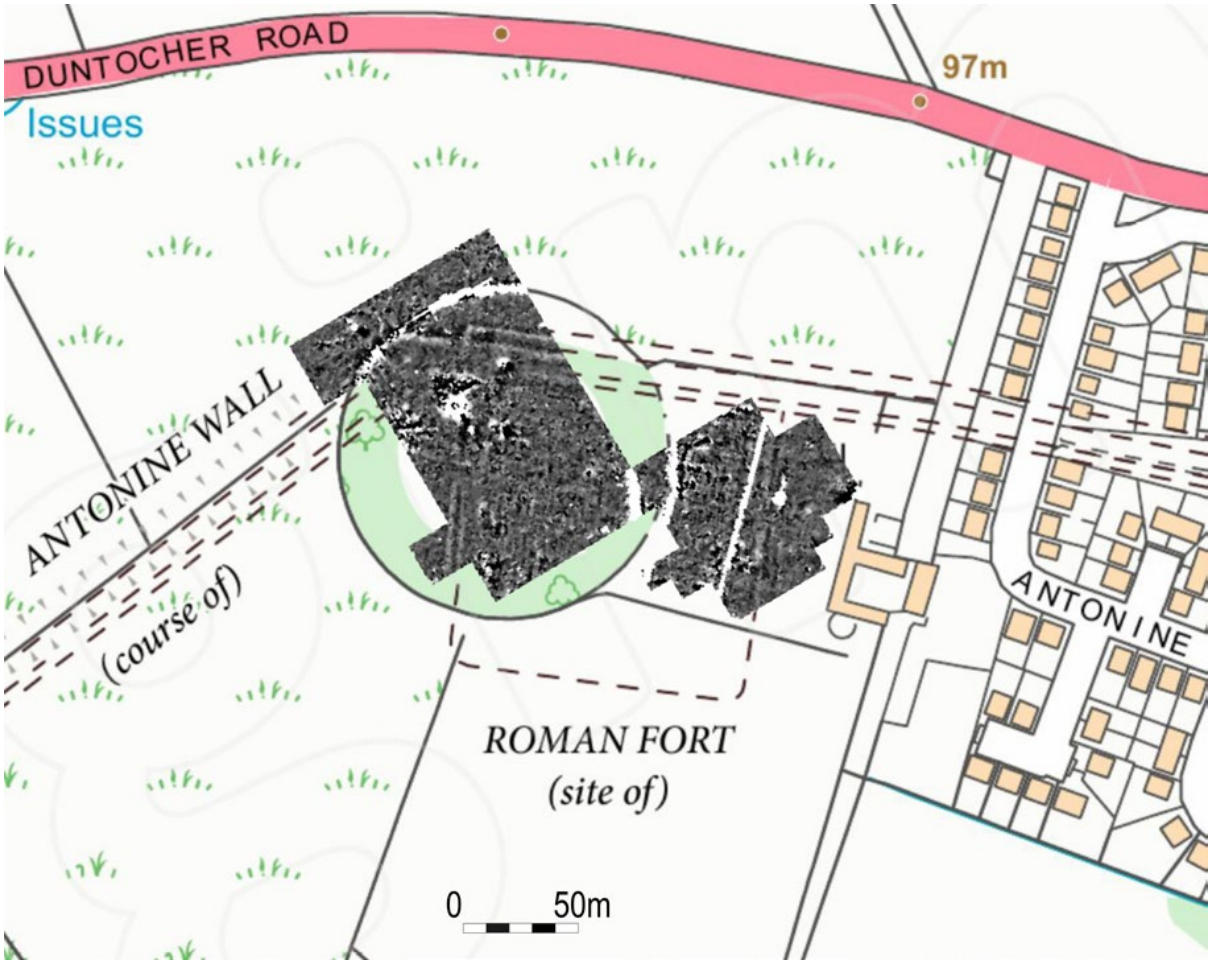

Figure 15.4. Location plan of the 2008 magnetic survey

duplicated some of the coverage obtained in 2008, but extended across the southern half of the fort and beyond (Figure 15.5). The third and most recent was confined to resistivity across the southern defences (Figure 15.3). In the first programme, a Geoscan FM36 gradiometer was used, with sampling and traverse intervals of 1 m in 20 m by 20 m grids. The same intervals applied to the resistivity survey with a Geoscan RM15 instrument in the twin probe mode in both 2008 and 2019. The 2011 magnetometry survey employed a Bartington Grad 601 single sensor gradiometer with sampling and traverse intervals of 0.25 m and 0.5 m respectively. The data was processed with Geoplot v. 3.1 using despike, low pass filter and interpolation procedures.

Operating conditions were not straightforward: as well as the slope, the vegetation was thick in places requiring trampling down in advance of survey; and the detrimental effects of standing trees or collapsed tree trunks, thick hedges and the remains of metal fences were significant. The relative clarity of the results in the field on the east side of the survey area closest to the farm can be attributed to the lack of surface obstructions.

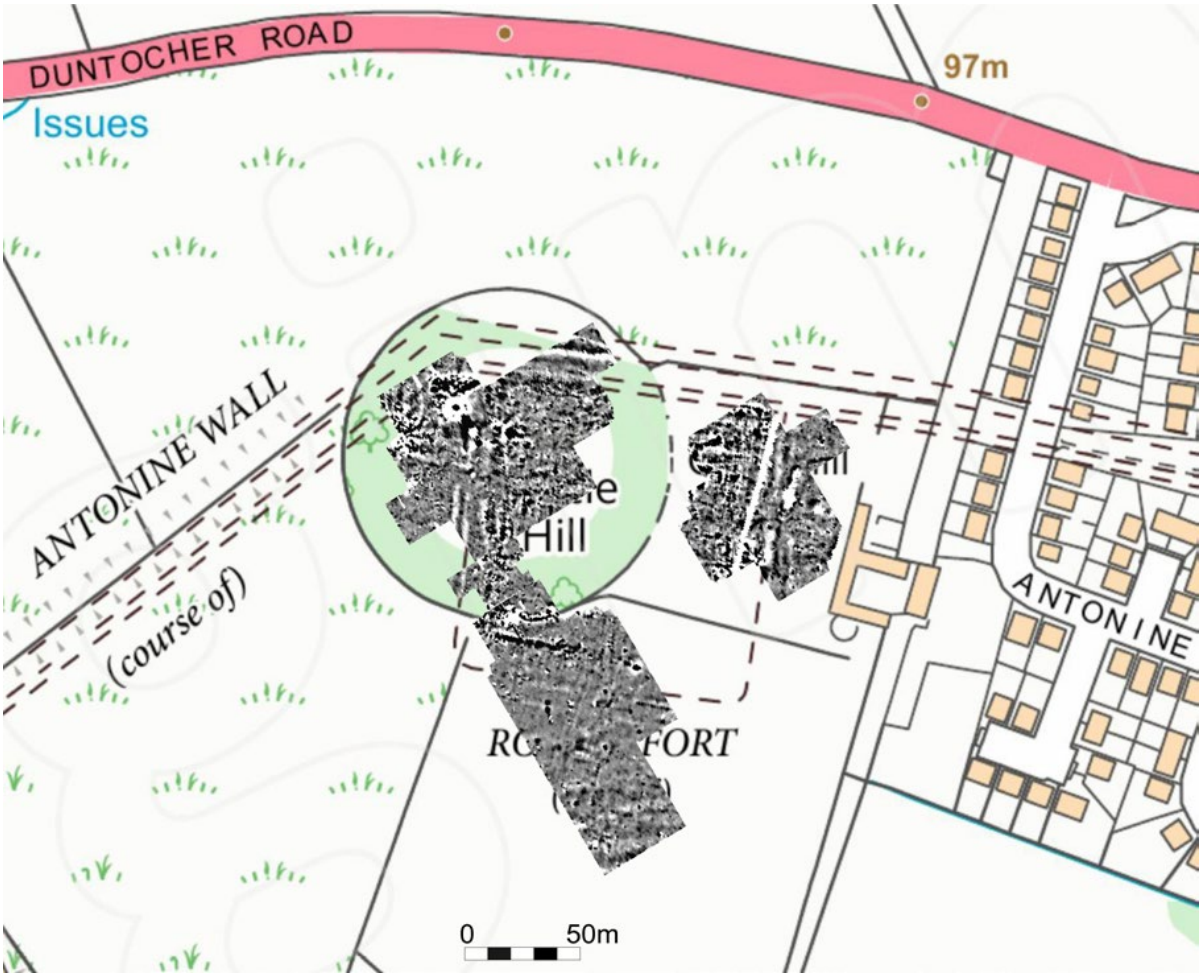

Figure 15.5. Location plan of the 2011 magnetic survey

Resistivity survey – results

Because there is no spatial overlap between them, the 2008 and 2019 resistivity surveys have been combined into a single, composite plot (Figure 15.6). The north-western part of the survey is somewhat dominated by modern features. The narrow curving line of high resistance at the top reflects part of the northern quadrant of the inner bank of the circular copse of trees that still rings the summit of the hill. The eastern side of same feature is similarly picked up as a curving band of high resistance, while parts of the south and west quadrants are apparent as much fainter lines of slightly elevated resistance. A short section of the corresponding outer edge of the copse is faintly visible as another slightly curving band of higher resistance in the centre of the survey. These concentric circular banks are also readily apparent in the LiDAR data (Figure 15.9). An inverted T-shaped, sharply defined, high resistance feature within the north-west quadrant of the inner ring also relates to a relatively recent intrusion. The point of very low resistance at its southern end corresponds with a rusting manhole cover that features prominently also in the magnetic survey as a strong bipolar anomaly (Figure 15.7).

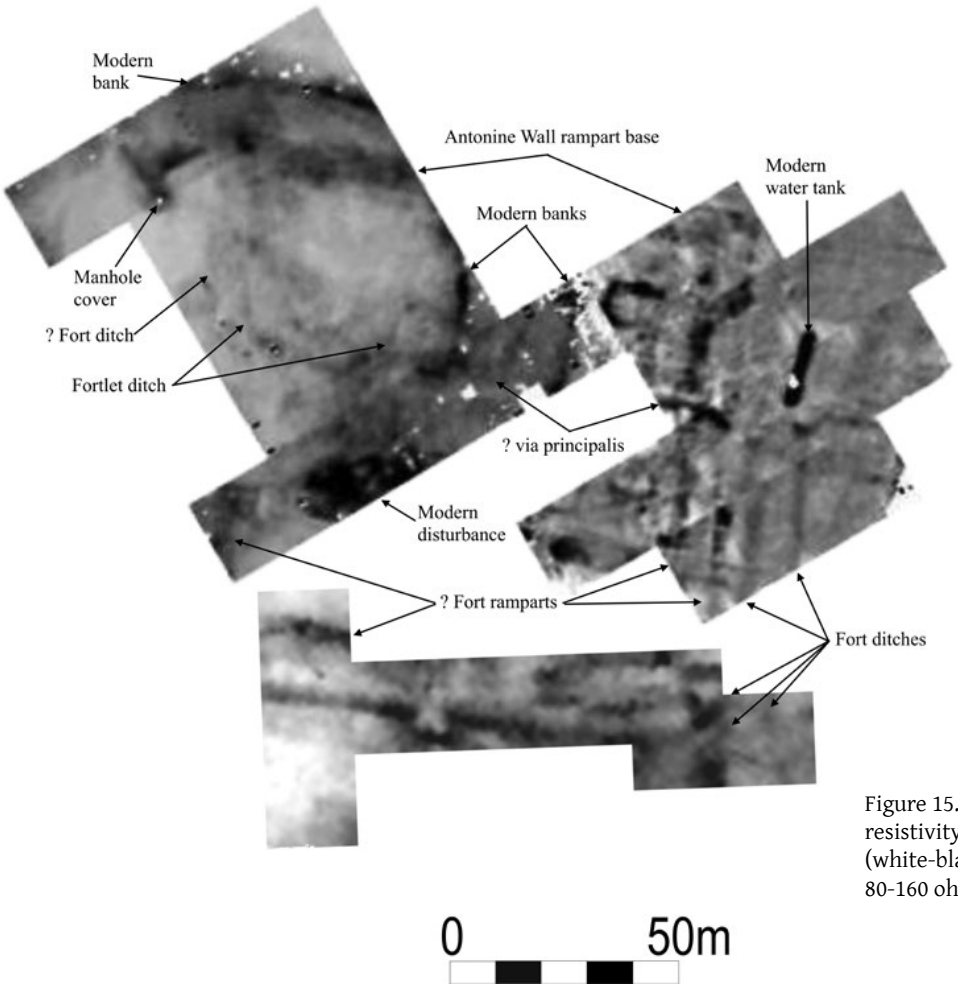

Figure 15.6. Annotated composite resistivity survey (2008 and 2019) (white-black palette equivalent to 80-160 ohms)

Finally, a large oval-shaped area of high resistance towards the southern limit of the 2008 survey coincides with an area of modern disturbance, again clearly visible in the LiDAR imagery (Figure 15.9), between the inner bank of the copse and the continuation of an earlier field wall.

Nonetheless, it is possible to discern some underlying archaeological remains. A broad band of high resistance, some 5-7 m wide, which is somewhat mottled in character in places, runs west-east from the modern T-shaped feature across the north-west corner of the fort. Though rather wider than might be expected, it would seem to represent the slightly disturbed line of the cobble base of the Antonine Wall rampart. This alignment is picked up again in the eastern half of the survey, where it joins what appears to be the east rampart(s) of the fort (below).

To the rear of the Wall base in the north-west corner of the fort is a U-shaped enclosure, some 30-37 m east-west by 35 m north-south internally, the latter dimension measured from the rear of the Antonine Wall rampart (Figure 15.6). This enclosure is defined by a single narrow ditch, visible as a line of slightly higher resistance, similar to those demarcating the east side of the fort (below). The ditch is clearest around the southern half of the enclosure. There are faint traces of another possible ditch

line running parallel to its west side, which may indicate that the enclosure was double-ditched. More probably, since there is no trace of an equivalent ditch on the south side, it represents the line of the western inner fort ditch that is partially apparent also in the magnetometer survey (Figure 15.7). A band of higher resistance at the south-western extremity of the 2008 survey may represent part of the line of the fort rampart, though there is no trace of it continuing further to the north. It coincides with part of the discontinuous broad band of positive anomalies visible in the magnetic survey (Figure 15.7).

Four parallel north-south alignments are readily apparent on the eastern side of the survey area (Figure 15.6). The innermost is a *c.* 4 m wide line of consistently higher resistance that is similar in character to the base of the Antonine Wall which it appears to join. This seems best interpreted as the eastern rampart of the fort. The outer two are visible as lines of slightly elevated resistance and presumably represent the fort ditches. The outermost can be traced only in the southern half of the surveyed area as further north it is overlain by a short band of very well-defined high resistance. This is clearly another modern disturbance, part of which, corresponding with a small circle of very low resistance, is represented on the ground by the capping of a sunken tank that, according to the landowner, relates to the early water supply for the farm. This feature coincides with a very strong negative anomaly in the magnetic survey (Figures 15.7 and 15.8), which is the usual signature for modern metal disturbance. The fourth linear alignment, located between the two ditches and the rampart, is of uncertain identification. It could be a third ditch, but contains occasional patches of higher resistance and appears to continue on to join the back of the Antonine Wall rampart. Though heavily masked by a modern fence line, the magnetic signal from the same feature is more reminiscent of a rampart than of a ditch (below) (Figure 15.8).

A slightly curving band of high resistance which cuts across the fort rampart and part of the enigmatic parallel linear feature approximately midway along their recorded lengths may represent the line of the *via principalis* as it leaves the fort. A band of slightly higher resistance continues that alignment both across the two outer ditches and possibly back into the interior of the fort.

The significance of the C-shaped band of high resistance in the north-eastern corner of the fort is uncertain. It could represent part of a stone structure, and corresponds with more angular linear alignments in the magnetometry (below and Figures 15.7 and 15.8), though it seems too wide for a wall foundation. It is perhaps more likely to be a relatively modern feature.

The inner southern ditch of the fort is picked up in the 2019 survey as a discontinuous line of higher resistance which curves northwards at its eastern end as it follows the south-east corner of the fort heading towards the inner ditch on the east side (Figure 15.6). A break in the line approximately half way along its length presumably coincides with the south gate of the fort. A short stretch of ditch immediately in front of that break is reminiscent of a *titulus*, but that would make no sense in front of an inner ditch; rather it may represent the western end of a narrow intermediate ditch in this quadrant which is hinted at in the aerial photographic record, as astutely noted by Keppie (1980: 82-83), and in the magnetometry (Figure 15.7). The line of the outer south ditch known from the aerial photographs is not readily apparent in the resistivity survey, though its position west of the gate may be broadly indicated by the break between a zone of enhanced resistance and one of very low resistance. At the south-east corner of the fort the course of the inner ditch is partly mirrored by faint traces of a narrow line of higher resistance that seems to represent a second ditch, presumably the intermediate one

noted above (Figure 15.6); while beyond it there are very slight indications of a curving line of higher resistance which aligns with the outer ditch on the east side of the fort, which presumably represents the continuation of that ditch around the corner of the fort.

A broadly parallel line of high resistivity some 10 m to the north of the visible southern ditch, which is clear at the western end of the 2019 survey and also perhaps on its northern limit further to the east, may represent the southern rampart of the fort (Figure 15.6). It mirrors a strong positive linear anomaly apparent in the 2011 magnetic survey that continues right across the surveyed area, allowing for a gap for the south gate (Figure 15.8).

Magnetic survey – results

The most prominent features at the north-western limit of the 2008 magnetic survey (Figure 15.7) again are modern. Strong positive and associated weak negative anomalies define the outer fence of the copse in two places as it curves around the hill. Just inside the band of trees it contains, in the north-west quadrant, is a line of three discrete strong bipolar anomalies. The most north-easterly of

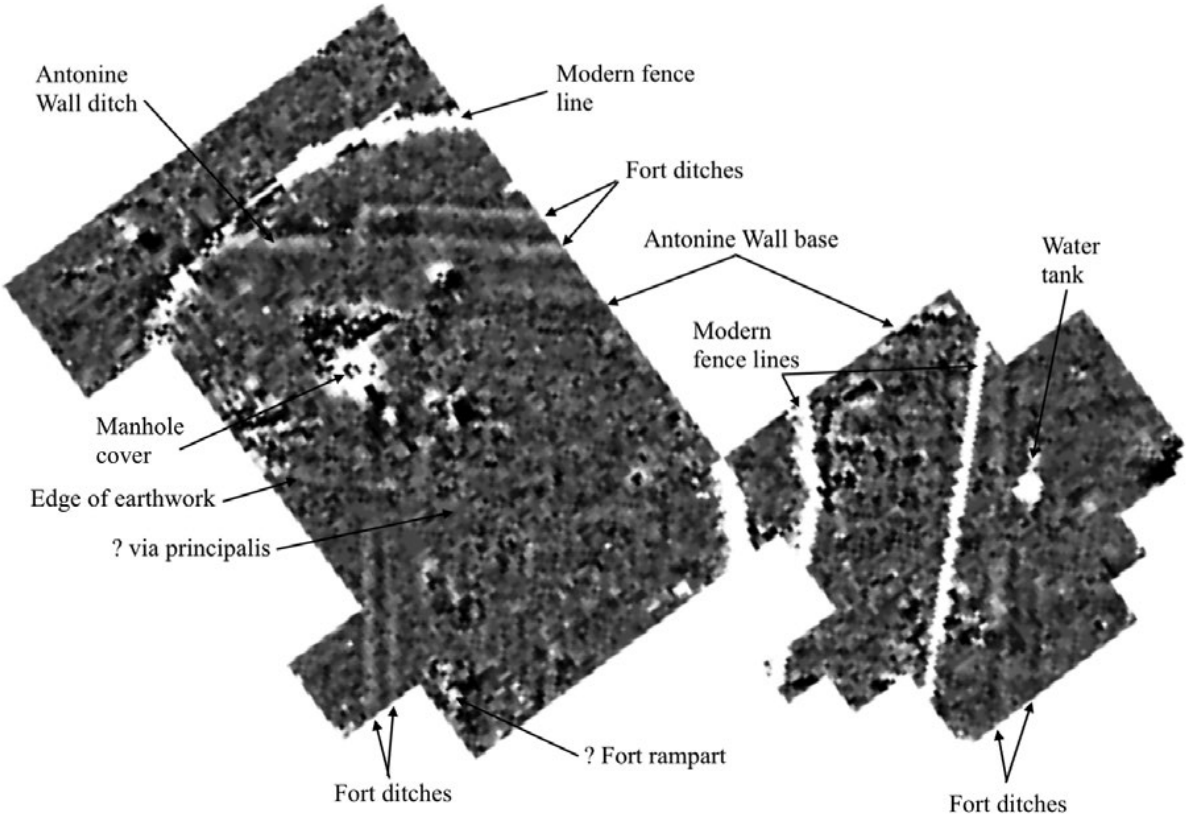

Figure 15.7. Annotated magnetic survey (2008) (black-white palette +/- 10nT)

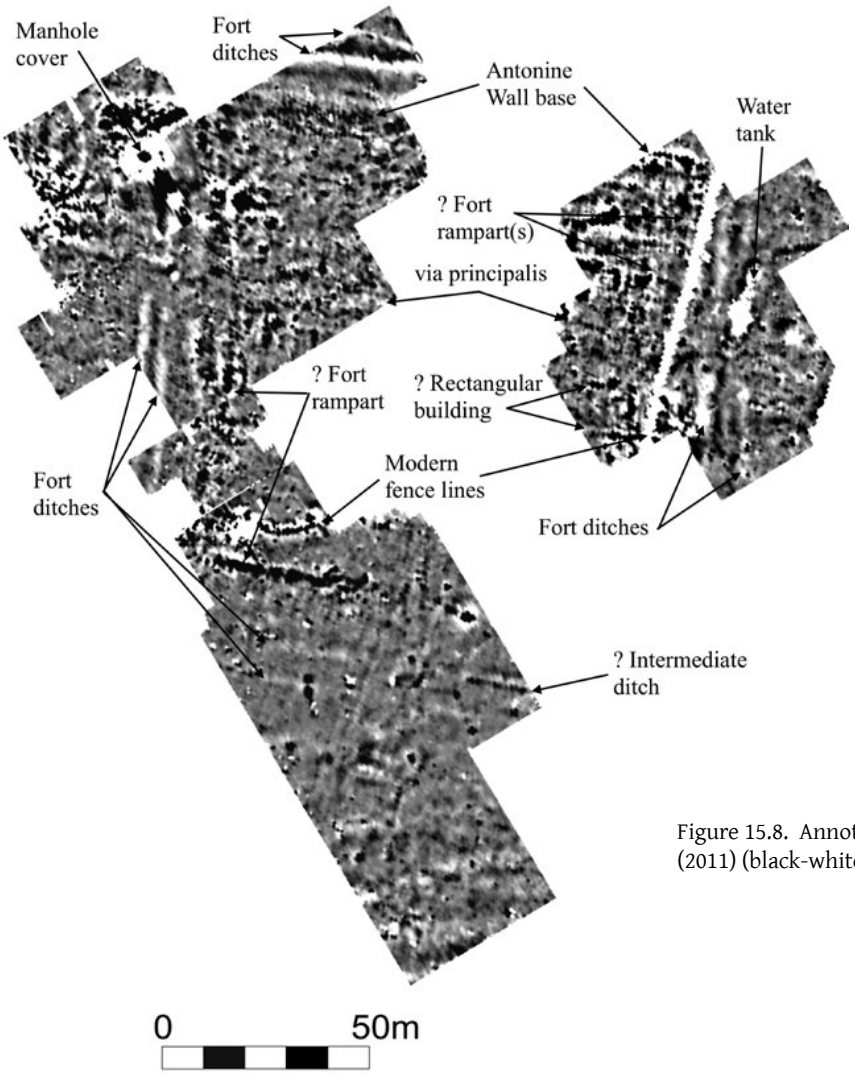

Figure 15.8. Annotated magnetic survey (2011) (black-white palette +/- 10nT)

these probably reflects an early trigonometric survey point that is recorded on the first and second edition 25 inches to the mile Ordnance Survey maps (Figure 15.2), but does not appear on large scale maps produced after the mid-1950s. Its position is now completely overgrown so could not readily be checked on the ground. The other two bipolar anomalies coincide with a small sub-rectangular earthwork visible on the LiDAR coverage (Figure 15.9), the strongest of which, visible also in the 2011 magnetic survey, reflects the presence of the manhole cover noted above.

The fence line at the north-west limit of the 2008 survey (Figure 15.7) cuts across and truncates a negative linear anomaly running west-east, combined with a slight positive one on its north side, with an overall width of c. 6.8m. This is clearly the ditch of the Antonine Wall, whose alignment continues to the eastern limit of the survey area and beyond into the additional area covered by the 2011 survey (Figure 15.8), though it appears to be slightly narrower in front of the fort. A second even narrower ditch line, similarly defined, runs parallel and immediately to the north (Figure 15.7). Only a small

section of this outer ditch falls within the 2011 survey, which hints at a slight southern curvature as it approaches the probable site of the north gate of the fort. The outer ditch does not continue to the west of the fort frontage, but turns south to cut across the line of the Antonine Wall ditch at right angles (Figure 15.7). It then follows the alignment of the outer ditch on the west side of the fort. Thus, not only was the Antonine Wall provided with slightly narrower double ditches to the north of the fort, but there is a clear disjuncture between its ditch and those of the fort.

A broad slightly speckled band of mainly positive anomalies *c.* 5.5 m wide running parallel to and to the south of the Antonine Wall/inner fort ditch presumably represents the base of the Wall/fort rampart. It is most clearly evident in the 2011 survey (Figure 15.8) and mirrors the band of high resistance in the resistivity survey (Figure 15.6).

The northern section of the western defences of the fort are masked by the strong signal from the manhole cover and associated modern disturbance, but two ditches showing as parallel negative anomalies, separated by a slightly enhanced positive anomaly, can be traced to the south-western limit of both surveys. There is a clear break in these ditches marking the position of the west gate. The line of the western rampart of the fort may be broadly demarcated by wide, slightly discontinuous bands of positive anomalies running inside and parallel to the ditches which are again visible in both surveys. Extending eastwards from the break in the ditches into the interior of the fort, the *via principalis* is faintly visible as a wide mottled band, particularly in the 2011 survey where it is demarcated on both sides by irregular lines of strong positive anomalies (Figure 15.8), possibly where drains have been variously infilled with debris. A slightly curving linear alignment which runs west from the northern side of the gap in the fort ditches corresponds with the southern limit of the subrectangular earthwork plateau visible in the LiDAR survey, which is discussed further below (Figure 15.9).

The lines of double ditches on the south side of the fort are faintly confirmed in the 2011 survey (Figure 15.8) in the same manner as the ditches to the north of the fort, though they are more widely spaced. There are also indications of a gap for the south gate. In addition, there is a slight hint of a possible third ditch to the east of the gate in the form of a narrow positive anomaly running between the inner and outer ditches, though closer to the inner. This mirrors evidence from the 1947 aerial photographs (Keppie 1980: 82-83) and is also hinted at in the resistivity survey (above) (Figure 15.6). A broadly parallel, strong positive linear anomaly to the north of these ditches may represent the southern rampart of the fort as there is a gap in its line broadly coincident with the gap in the ditches, though this linear feature is rather different in character to the other possible ramparts. The same feature is visible as a band of higher resistance in the resistivity survey (above) (Figure 15.6). The short, narrow curving line of a strong positive and associated weak negative anomaly to the north of it is part of the outer fence line of the copse (Figure 15.8).

Only two ditches are visible on the east side of the fort in both the 2008 and 2011 surveys (Figures 15.7 and 15.8). They are revealed as quite strong, parallel negative anomalies, particularly in the 2011 survey, which are slightly more widely spaced than on the west side and separated by a more strongly enhanced positive anomaly. The northern part of the outer ditch is obscured by a strong bipolar anomaly reflecting the presence of a buried water tank, as noted above. An apparent gap in the inner ditch, directly opposite one on the west side of the fort, marks the position of the east gate. As on the west side of the fort, a broad, slightly discontinuous band of mixed positive and negative anomalies

inside the ditches apparent in the 2011 survey may represent the line of the rampart base (Figure 15.8). This corresponds with a line of consistently higher resistance in the resistivity survey (Figure 15.6). The linear anomaly of uncertain identification immediately to its east, which is also apparent in the resistivity survey, is largely masked by the strong negative signal from a modern fence. However, where it is apparent in the 2011 survey (Figure 15.8), its character seems to have more in common with the rampart inside it than the ditches outside it.

There are few anomalies that can be identified as buildings in the interior of the fort, though there are several areas that show clusters of positive anomalies, some of which may be demolition pits. Though suggestive of part of a sub-rectangular structure, short linear alignments of positive anomalies to the north of the *via principalis* on the eastern side of the fort, corresponding with a small C-shaped feature in the resistivity survey (Figure 15.6), again seem too broad to be wall foundations. However, the end of one possible rectangular building *c.* 11 m wide is indicated in the 2011 survey by narrow positive and associated negative linear anomalies inside the probable rampart on the same side of the fort immediately to the south of the *via principalis* (Figure 15.8).

LiDAR (Figure 15.9)

The line of the Antonine Wall ditch is very clear in the LiDAR survey where it descends the steeper western slope of Castlehill. It remains visible on the ground today, though somewhat masked by a field boundary hedge. The line can also be traced to the east of the fort, but much more faintly and again masked by a prominent field boundary hedge. While still recorded as an earthwork on the first and second editions of the 25 inches to the mile Ordnance survey maps of 1863 and 1898 (Figure 15.2), ploughing seems to have removed any obvious signs of the ditch to the east of the fort within a few years as, by the 1918 edition of the same map, it is recorded only as a dotted line demarcating the track of the Antonine Wall. The disjuncture evident in the magnetic survey between the ditch of the Antonine Wall and the two ditches in front of the fort at its north-west corner (Figure 15.7) is clearly visible also in the LiDAR survey.

Immediately to the south of that disjuncture is a subrectangular area of raised ground which is still visible today. This is clearly the earthwork plateau recorded by Keppie in his plan and interpreted as the site of a possible fortlet (1980: 83-84). The plateau is variously recorded on large-scale Ordnance survey maps up to the later 1950s. It does not feature on the first edition 25 inch to the mile Ordnance Survey map of the area, surveyed in 1860, but first appears on the second edition of 1898 (surveyed in 1896), where it clearly overlies the faint traces of the ditches on the western side of the fort (Figure 15.2). This relationship is confirmed by the LiDAR survey, which also depicts a small raised circle at the centre of the plateau. This circle denotes the manhole cover that is responsible for the strongest bipolar anomaly in the magnetometry (above). According to the landowner, this cover caps a well from which the farm drew its water supply prior to the installation of mains water in the 1950s. It seems likely, therefore, that the well was dug at some time between 1860 and 1896 and the material from its construction was spread out to form the low mound or plateau that is still visible on the ground.

Finally, the line of the ditches of the fort to the south of the Wall is very faintly apparent as a broad hollow on all three sides. Indeed, the slightly raised platform of the fort can still be traced on the ground around its southern and much of its western side.

Figure 15.9. LiDAR-derived 1 m resolution digital terrain model
(© NERC Centre for Ecology & Hydrology; British Antarctic Survey; British Geological Survey)

Interpretation and wider context

At *c.* 6.8 m in width, the Antonine Wall ditch conforms with other sections recorded in this westernmost sector of the Wall which are consistently narrower than the imposing obstacle still visible in parts of the central sector. For example, a section excavated at Peel Glen only 280 m west of Castlehill indicated a width of 7 m; three sections cut to the south-east of the fort at Duntocher were only 6.1-6.4 m wide; while some 1.5 km further west at Carleith the ditch was even narrower, only 5.6 m in width (Keppie and Walker 1989: 155; Robertson 1957: 7-11; Keppie and Breeze 1981: 235).

The provision of slightly narrower double ditches to the north of the fort is reminiscent of the situation at Duntocher and Auchendavy (Robertson 1957: 40-41; Jones and Leslie 2015: Fig. 22.2; Hanson forthcoming a), though recent geophysical survey has indicated that there were, in fact, three ditches north of the fort at the former (Jones 2016). There is a clear disjuncture or misalignment between the ditch of Antonine Wall and those of the fort at Castlehill outside its north-west corner, which must

indicate that the fort and Wall were not built contemporaneously. This relationship is most closely paralleled by the misalignment of the ditches outside the north-west corner of the fort at Auchendavy, which is also considered to have been constructed before the Wall (Jones and Leslie 2015: 319 and Fig. 22.2). The magnetic survey appears to indicate that the outer fort ditch at Castlehill is later than that of the Antonine Wall, though it is difficult to envisage how the depicted relationship would have manifested itself stratigraphically assuming the two ditches were open at the same time. It is perhaps more likely, therefore, that the fort was built as a freestanding structure to which the Wall later abutted. This was also the case at both the adjacent fortlet at Cleddans and the next fort to the west at Duntocher, where a similar misalignment between their ramparts and that of the Antonine Wall is apparent at their north-east corners (Keppie and Walker 1981: 154-56; Robertson 1957: Figs. 21 and 23). A similar chronological relationship between fort and Wall would not be out of place as Castlehill is the point at which the unit of measurement for the construction of the Wall recorded on the Distance Stones changes from paces to feet (*RIB* I 2196 and 2197), which is generally taken to indicate that this section of the Wall was the last to be constructed (Hanson and Breeze, this volume).

The east side of the fort is clear in both the resistivity and magnetic surveys, defined by two parallel ditches. The possibility of two adjacent lines of rampart within them is without ready parallel, but may hint that the site experienced an even more complex structural history than might have been anticipated. Two ditches were confirmed in the magnetic survey on the both the south and west sides of the fort, with the possibility of a third narrow intermediate ditch in the south-east quadrant. The position of the gates on all three sides is indicated by gaps in the ditches. If the broad discontinuous bands of higher resistance and positive anomalies within the ditches of the fort have been correctly identified as ramparts, the internal east-west dimension of the fort (measuring to the inner eastern rampart) would have been *c.* 94.5 m. Measuring from the back of the Antonine Wall rampart to the inner southern ditch, the equivalent north-south dimension would have been *c.* 119 m, allowing for the estimated width of the southern rampart and berm (*c.* 8 m), giving an internal area of *c.* 1.13 ha (2.8 acres). This is somewhat less than earlier calculations, though these were based on the area within the ditches plotted from oblique aerial photographs. If the strong positive linear alignment visible in the 2011 magnetic survey and in the 2019 resistivity survey does represent the southern rampart of the fort, that would reduce the north-south dimension to *c.* 110 m and, correspondingly, the internal area to *c.* 1.04 ha (2.6 acres). The possibility of a second rampart line on the east side may indicate a slight adjustment to the size of the fort during its construction, as happened at nearby Bearsden, where an annexe was carved out of an originally larger fort enclosure (Breeze 2016: 320 and illus. 21.14), and possibly at Auchendavy, where the 'trident' ditch configuration beyond the north-west corner of the fort recorded in the geophysical survey (Jones and Leslie 2015: 319 and Fig. 22.2) hints at an earlier intention to construct a larger fort enclosure.

Had the fort had been provided with an attached annexe, the local topography would have determined that it lay on the more gentle slope to the east of the fort. However, neither the 1947 aerial photographs nor the 2019 resistivity survey indicated the presence of any connecting ditches outside the south-east corner of the fort (Figure 15.6). Antiquarian records of Roman stonework from Peel Glen some 400m to the south-west of the fort may indicate the presence of a bathhouse taking advantage of the only running water in the immediate vicinity (Bailey and Mearns, this volume). Such an arrangement would be similar to that at Duntocher, where the bathhouse was located by the Duntocher Burn down the slope to the north-west, though in that case somewhat closer to the fort (Keppie 2004).

The traces of buildings within the fort are very slight and insufficiently clear to provide certain identifications. However, the hint of a rectangular building to the south of the *via principalis* visible in the magnetic survey from 2011 may represent one end of a barrack block running east-west or rather, since such buildings were normally post-built (Hanson and Maxwell 1986: 175-6), an infilled drain around it.

The earthwork plateau which is located just outside the north-west corner of the fort may be dismissed as a late 19th century construction. However, the small, ditched enclosure visible in the resistivity survey (Figure 15.6) clearly sits in the north-west corner of the fort on the very summit of the hill. Both its location and dimensions match the antiquarian accounts, as summarised by Keppie (1980) and depicted by Roy (Figure 15.1). Its dimensions and slightly irregular shape are also quite closely paralleled by the restored outline of the ditch surrounding the fortlet at Kinneil (Bailey and Cannel 1996: illus. 28). Its identification as a fortlet, therefore, may be asserted with some confidence. The overall sequence of construction at Castlehill, with a fortlet replaced by a freestanding fort before the line of the Wall reached the site, is closely paralleled by the adjacent fort to the west at Duntocher (Robertson 1957). Along with Croy Hill (Hanson forthcoming b: ch 3), this provides a third example on the line of the Wall of a fortlet succeeded by a fort, which adds further weight to Gillam's hypothesis that the Antonine Wall went through a major change of plan during its construction (Gillam 1975; Hanson forthcoming a).

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