

RECENT INVESTIGATIONS AT THE KING'S KNOT STIRLING

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The King's Knot is a familiar Stirling landmark which over the centuries has intrigued both visitors and historians alike. The grass covered octagonal mound and square parterres are the remnants of a large landscaped garden apparently constructed in the late 1620s for Charles I (RCAHMS 1963: 219). These earthworks represent the final major investment in a great royal garden originally conceived by James IV in the 1490s and laid out within the Auld (royal) Park. It served the Stewarts well throughout the 16th century when Stirling Castle was a principal royal palace. However records of it are scarce and we have no accurate description, plan, or painting of it from when it was in use. This lack of knowledge together with some features which appear incongruous to the main earthworks, such as the large ditch south of the mound, has led to much speculation on the origins of the Knot. A belief that it was concealing earlier monuments seemed to be confirmed in 1975 when aerial photography recorded the presence of a multi-ditched enclosure running around and beneath the main mound. Without excavation this only added to the mystery.

In 2011 members of the Stirling Local History Society, and the Stirling Field and Archaeological Society, together with staff and students of the Archaeology Department of Glasgow University undertook a topographical and geophysical survey of the King's Knot (Digney, Jones and Maldonado, 2011). Our goal was to investigate and research the royal garden of Stirling using non-invasive techniques, and give society members and students an opportunity to experience archaeological fieldwork. The project was jointly funded by Historic Scotland and Stirling City Heritage Trust and has been supported by the Stirling Smith Art Gallery and Museum.

Historical background

A royal garden associated with Stirling Castle first appears on record in 1453 (ER V: 597) and may have been a small garden within the castle. It is not until the 1490s, when James IV began the work of creating a 'new' or 'great garden' below the castle that some details of the royal gardens emerge. Italian Renaissance concepts of gardening as a high art form and the garden as an 'earthly paradise' were becoming fashionable in northern Europe, and James was quick to embrace them. Work on the 'great garden' began in 1493 with the digging of ditches (ER XI: 144). This seemingly continued in 1496 (AT I: 276, 277, 278) and a bank and ditch boundary was established which probably also provided some much needed drainage. In 1497/1498 over 1100 young (possibly fruit) trees were bought for the garden, peas and beans were planted, and fish ponds were dug (AT I: 367, 386, 388, 390).

The garden developed further in 1501 with the appointment of a new head gardener, George Campbell. In February of that year 400 thorn trees were bought for hedging (AT II: 81-84). Further trees were purchased including sixteen pear trees, many willows, and other unidentified trees, as well as diverse seeds. Campbell was aided by an unnamed French gardener who planted vines (AT II: 102-105). The following year 1500 plum trees were sent from Culross (AT II: 358), while other fruit trees were brought in from the Carse of Gowrie and Couper Angus (AT II: 354, 425).

As well as thorn hedges and ditches, the garden was enclosed by a pale or fence in 1502-3 (AT II: 362). By this time the garden would have been well established and filled with what seems an extraordinary number of young fruit trees, as well as flowers and herbs. Fish ponds and the nearby Park Loch were regularly stocked with perch, trout and pike. Ornamental birds such as herons, cranes and bitterns, which appear in the records of the 1530's (AT VI: 97, 206, 208), probably nested in the reeds around the loch. Peacocks (including white ones) sent to Stirling from Scone (AT II: 96, 135, 445), may have stalked the garden, unless destined for consumption at royal feasts. With his 'great garden' and park, James had created a landscape of leisure which would have been impressive by the time of his marriage to Margaret Tudor in 1503. He had the pleasure of it for a further ten years before the disastrous battle of Flodden. Among those killed with the king was George Campbell (ER XIV: 38). Their legacy was a garden which flourished throughout the 16th century as an integral part of the royal palace of Stirling.

James V took possession of Stirling Castle with its park and garden when it was transferred to him from his mother in 1531 (ER XVI: 138). He soon made his mark on the royal gardens and from the 20th of April until the 8th of June 1532, four men with four horses were set to work preparing the ground and creating turf banks, while two gardeners made banks, cast knots, and sowed the garden with flowers (MWI: 109-110). This work may have taken place in the smaller garden within the castle (Brown 2012: 77). The two gardeners may have been Sir James and Sir Walter Clement (Clemat) who are named as (master) gardeners at Stirling in 1533 and 1534 (AT VI: 102, 205, 212). Their social status suggests the position as royal gardener was held in high regard. We can imagine the garden was kept in excellent condition during the reign of James V (1513-1542), especially after his visit to the royal palaces and gardens of France in 1537-1538, and with the income of two large wedding dowries, but the surviving records provide no details.

In 1583 a review of the costs for the repair and improvements of Stirling Castle for James VI described the park and garden as part of the fine view which made the palace of Stirling *the best and most pleasant situation of any of his highness's palaces* (MW I: 310). When James VI inherited the English throne in 1603 the royal focus switched to the palaces of England. James made one more visit to Stirling in 1617 and some work was done in the garden for that occasion (MW II: 27), but without a regular royal presence signs of decline soon became apparent.

Within a week of the opening of the first Parliament of Charles I in June 1625, a warrant was sent from Whitehall to John, Earl of Mar (Principal Treasurer of Scotland) to appoint *a skilfull and well experimented gardener in England* to reside at Stirling because the king had been informed that the garden had *for lack of attendance become wilde and overgrown with bushes and brambles; the state of which being an imputatioun to that wholle kingdome* which he thought should be remedied (MK 1904: 131).

William Watts was appointed and from 1627-1629 a considerable sum (over £1300 Scots) was spent on provisions, materials and the wages of workmen that worked *at the platting and contriving of his Majesties new gairden and orchard park of Stirling* (MW: 230, 242, 257). Watts had the fence and dyke of the new garden repaired to keep out deer (MW II: 370), and the whole garden project may have been completed in time for Charles' Scottish Coronation and his stay in Stirling in June/July 1633.

Watts and his workmen appear to be responsible for creating the geometric earthworks we see today although a late James VI period construction is a possibility (Brown, 2012: 178, 181). What we do not see, and have no record of, is the arrangements of plants, hedges, trees, statues or other ornamental features. After the execution of Charles I in 1649, Charles II resided in Stirling in 1650 and 1651, but the threat posed by the forces of Cromwell meant that gardening was of little concern. Extensive repairs to the park dykes were made in the 1670s but we have no account of any garden work (Harrison, 2010: 41). It was probably minimally maintained, but with the death of Charles II in 1685 and the exile of James VII in 1688 the royal garden, symbolic of and dependent on the prosperity of the Stewarts, became redundant.

Visitors to Stirling in the early 18th century observed vestiges of the garden's grassy walks and parterres (Sibbald, 1707: 46; Defoe, 1991: 333), but it was in a state of decay and with only a few stumps of fruit trees remaining by the latter part of the century it was noted that through *long neglect, and the natural wetness of the soil, the place is now little better than a marsh* (Nimmo, 1777: 250). The main Knot earthworks were partitioned off and used for grazing while other parts became lost in cultivated fields. Around 1810 the Knot was truncated by the construction of the Dumbarton and Raploch roads. Despite these encroachments the historical value of the King's Knot was recognised and in 1867 the Office of Works had it carefully restored, leaving it in its present condition. It is now a scheduled monument in the care of Historic Scotland.

Antiquarian Interest

Since the abandonment of the royal garden the earthworks have attracted the attention of antiquarians and local historians. They have commonly held the view that the King's Knot has a deep and complex history. It has been suggested that the earthworks conceal a lost Roman fort (Maitland, 1757: 194; I. Orkney, pers.comm 2011), and the large octagonal mound has been

suspected of being a modification of a pre-existing mound, possibly a motte or moot hill, or even a barrow (Shirra, 1888/9: 41-43; Cook, 1907: 132-133). These ideas propose long-term reuse of an ancient monument by Scottish kings.

The King's Knot has also been linked to the Round Table tradition of Stirling (Nimmo 1777: 251). This seems to have originated in the late 14th century when the identification of ancient Stirling as the Arthurian Snowdon was being propagated by David II (Loomis, 1947; 1955-56: 15-19; Kervyn de Lettenhove, 1967 II: 313-314; Diverres, 1965; Ditmas, 1974; Penman, 2004: 340-343). Snowdon or *Sinaudon*, according to Romance poetry, was where the Round Table was kept. Furthermore the following well known verses appear to indicate that there was something below the castle, possibly an earthwork, known as the Round Table:

*And beneuth the castell went thai sone,
Rycht be the Rond Table away,
And syne the Park enveround thai,
And towart Lythkow held in hy.*

(From Barbour's *The Bruce* (c. 1375), Book XIII, lines 378-381 in Duncan, 1997: 498-499)

*Adew, fair Snawdown, with thy touris hie,
Thy Chapell Royall, park and tabyll round.
May, June, July walde I dwell in thee,
War I one man, to heir the birdis sounde,
Quhilk doith agane thy royall roche redounde.*

(From Sir David Lyndsay's *Testament and Complaynt of our soverane Lordis Papyngo* (c.1529) in Williams (2000: 79).

If true this feature may have served as a focal point for the royal tournaments (with Arthurian themes) which took place during the reigns of David II and the early Stewarts (Ronald, 1890: 5; Edington, 1998: 53-54). It is not known whether this 'earthwork' was created by David II (or his predecessors) or if it was an ancient feature which attracted 14th century antiquarian interest.

Previous Archaeological Investigations

Despite being described by Cox (1935: 19) *as by far the most important garden (in Scotland) prior to 1600* the King's Knot has received very little archaeological attention. O.G.S. Crawford visited the site in 1937 in search of the Roman road and postulated a Roman fort but found nothing other than the large enigmatic ditch orientated NW-SE at the southern end of the Knot and suggested that *a few trial trenches would probably settle the matter* (Crawford, 1949: 22).

The Stirling Field and Archaeological Society dug a trench across a ditch in

the Stirling Golf Club practice range in 1975. This was reportedly an extension of the large ditch referred to by Crawford and was found to be 8.23 m wide, very wet, with signs that its sides had collapsed at least twice, trapping vegetable matter (Milne, 1975: 53-54). Unfortunately no location maps, photographs, finds, or section drawings were ever published, thus keeping us in the dark.

In 2009, ahead of an upgrading and widening of the King's Knot roundabout, a linear feature was revealed in an evaluation trench which was interpreted as part of the truncated NW parterre (Cook, 2009: 177). Finally, in the same area, a further watching brief was carried out which identified more of this parterre and identified redeposited sands and gravels which may have been used in a decorative border (Ewart, 2010: 170).

Aerial photography

Aerial photography provided the first insight into the true complexity of the King's Knot. In the dry conditions of 1975 a multivallate enclosure was revealed as grass marks and photographed by Kenneth St. Joseph. It consists of three parallel ditches (3.5 m-5 m in width), forming part of an oval shaped



Figure 1. Aerial view of the King's Knot in 1975, showing multivallate enclosure beneath the mound (arrows). © RCAHMS

enclosure approximately 100 m x 125 m across. (Figure 1). Running around and beneath the existing octagonal mound, this enclosure is proof that there really had been an earlier monument at the King's Knot. From the air the circuit of the ditches appear incomplete, with the NE section either truncated or deeply buried.

These ditches are visible on the ground, particularly in the southeast, as low sunken depressions. This suggests that they were covered during the construction of the Charles I garden and that the covering material has subsequently subsided with compaction. Knowledge of the existence of this multivallate enclosure provided a primary motivation for our geophysical survey which we hoped would produce new insights. As an aid to our 2011 survey, the 1975 aerial photograph transcription was reproduced on our topographic plan (Figure 2). A full transcription showing other noticeable marks has yet to be done.

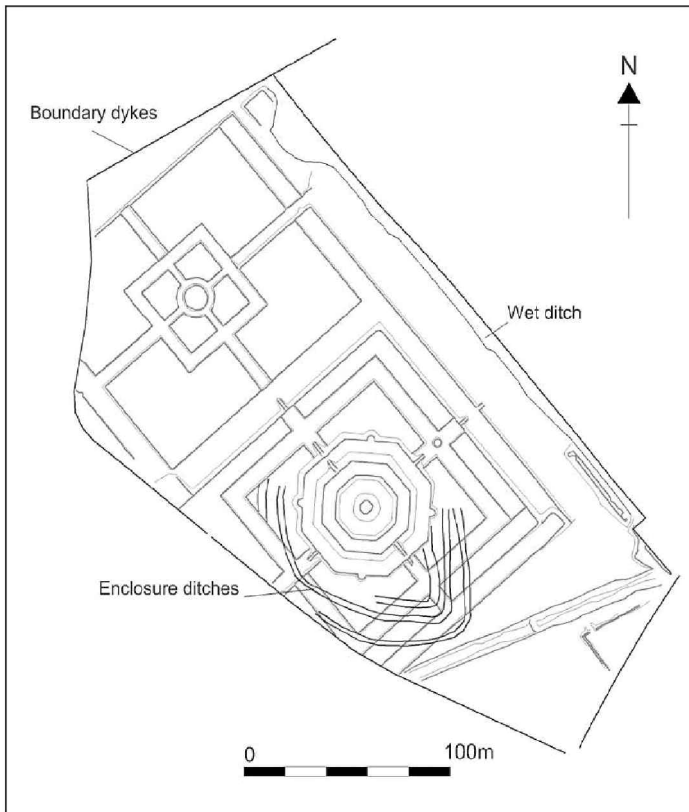


Figure 2. Reproduction of 1975 AP transcription (RCAHMS: STD/136/68) overlaid on current topographic survey.

Another aerial view (Figure 3) showing linear features in the Butt Park (top right) and a cropped field (top centre) are suggestive of a lost garden boundary. The feature in the Butt Park, heavily denuded by the hooves of cattle, may be a natural channel that has been adapted and included in this boundary system. In the crop field a ditch is accompanied by an outer bank, both have been severely ploughed.



Figure 3. Oblique aerial view from SE showing earthworks in adjoining fields to the N (arrows). © RCAHMS

The connection between these linear ditch features is obscured by the modern roads. Road widening in 2010 has further covered the linear feature in the crop field. These features are often filled with water, much of which comes from the spring at the Butt Well but also drainage from the King's Knot and surrounding slopes. The Raploch road has checked the flow or seepage of this water, causing a pool to form in the Butt Park. This suggests that prior to the construction of these roads the water carried in these ditch features probably once pooled in the lower field on the carse. The outer bank of the ditch here may have acted as a sort of dam. Also showing in the same photograph are areas of truncation and disturbance along the eastern boundary of the Knot. This probably occurred sometime after the construction of the Charles I earthwork but before the 20th century.

Topographic Survey

Using a total station a working plan of the King's Knot was produced (Figure 4) and survey grids were set out and recorded. This allowed the results of our geophysics to be displayed and overlaid on the plan accurately. While by no means perfect or complete the plan displays all detail captured during the short time of the fieldwork. Survey stations 6 and 7 are semi-permanent thus enabling the addition of future work to the plan.

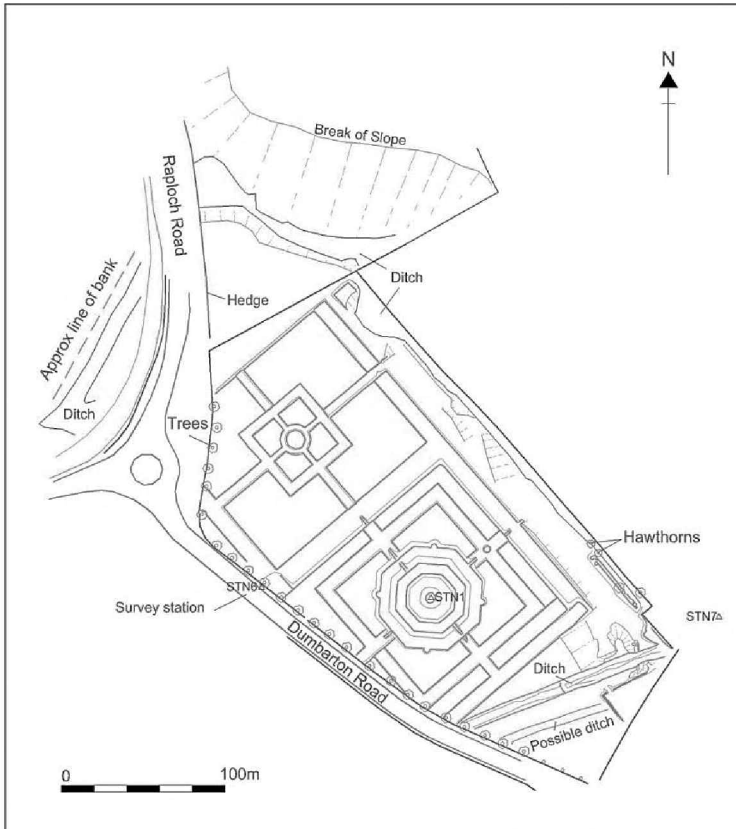


Figure 4. Topographic survey of the King's Knot.

The linear features in the adjacent fields discussed above were also included along with some basic topography. This proved useful as it showed that the ditch and bank in the crop field (to the NW) and the large ditch lying to the southeast of the octagonal mound have a symmetrical relationship. This suggests that these large ditches, including the ditch running beside the wall on the north-eastern flank of the King's Knot, are probably contemporary.

Geophysical Survey

The King's Knot is a large open grass covered field, with relatively flat areas, which provides good conditions for geophysical surveying. It offered an excellent opportunity to deploy three complementary, well-known techniques of geophysical survey (Table 1), all of which are suited to the detection of the kinds of buried man-made and natural features that were expected.

<i>Technique</i>	<i>Operating conditions</i>
Magnetometry	Bartington Grad601 gradiometers; 20 x 20 m grids; 0.5 m traverse; 0.25 m sample interval; 4.8 ha survey
Earth resistance	Geoscan RM15 resistivity meter; 20 x 20 m grids; twin-probe (0.5 m separation); 1 m traverse and sampling interval; 3.6 ha survey
Ground-penetrating radar (GPR)	Utsi Groundvue 3 GPR with 400 MHz antenna; 2000 m ² survey

Table 1. Geophysical survey techniques used at King's Knot.

The magnetic survey was extensive, encompassing most of the King's Knot field, but also a section of the grounds of the neighbouring Stirling Golf Club (Figure 5). The slower and lower resolution electrical survey was restricted to the King's Knot but covered a large area. The initial GPR work in 2011, which involved measurements in five grids to the south of the main mound allowing 3D time slices to be built up, was extended in 2012 to focus on specific targets suggested by the results of the other geophysical methods (O'Grady, 2012).

The subsoil of the King's Knot contains the sands and gravels of a glacial raised beach. However this is further complicated because as a landscaped garden monument, constructed in the form of a series of geometric platforms and terraces, it also consists of imported or redeposited material (mainly sands). These deposits have the potential to obscure underlying features depending on their depth. This is important because while the GPR is capable of sensing up to about 3 m below the ground surface, the magnetic and electrical methods can only penetrate a little over 0.6 m. Normally this would not cause any difficulty as topsoil on average is rarely much over 0.3 m in depth, but this becomes problematic when added to imported deposits of uncertain depths. Waterlogging, west of the smaller mound known as the Queen's Knot, also gave rise to particularly low values of electrical resistance. Both of these problems will be discussed in relation to the results presented below. The magnetic and earth resistance results were visualised as grey-scale plots using Geoscan's Geoplot 3.0 .

The survey results are encouraging. The resistance data (Figure 6) confirms the presence of the multivallate enclosure. On closer examination of the

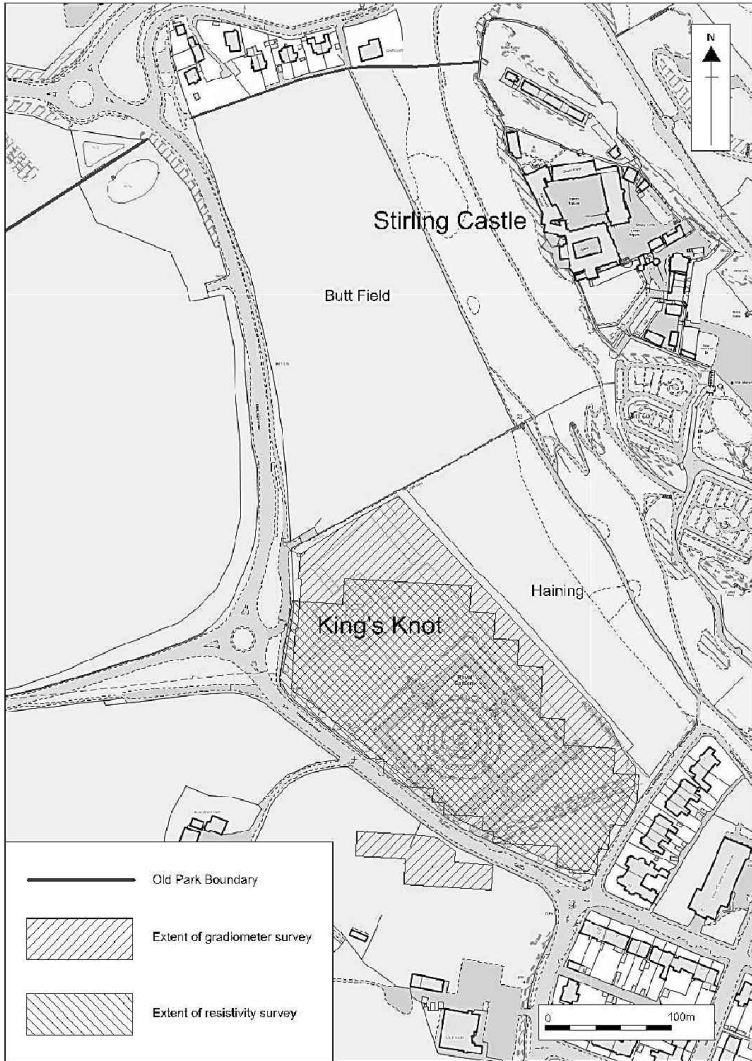


Figure 5 The extent of the 2011 geophysical surveys. © Crown Copyright/database right 2011. An Ordnance Survey/EDINA supplied service.

graphic the ditch system appears to show a degree of complexity which hints at multiperiod construction. Immediately to the north of the stepped mound the electrical response alters due to the presence of overburden and the ditch system is difficult to see.

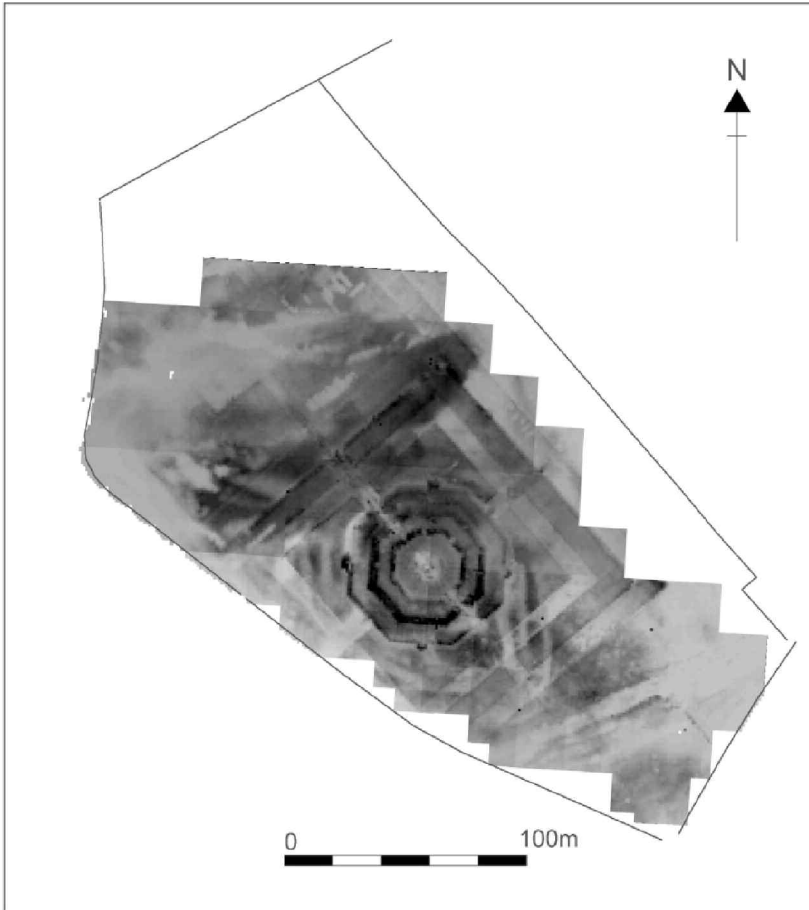


Figure 6. Results of Resistivity Survey (black and white are high and low resistivity respectively).

GPR confirmed that the level of the ground in this area has been substantially raised but the multivallate ditches are still present although severely truncated (O'Grady, 2012: 9, 11). On the lower ground of the Queen's Knot are a number of rectangular anomalies, of uncertain purpose, but which may be garden features or cuts in the ground related to drainage (Figure 7).

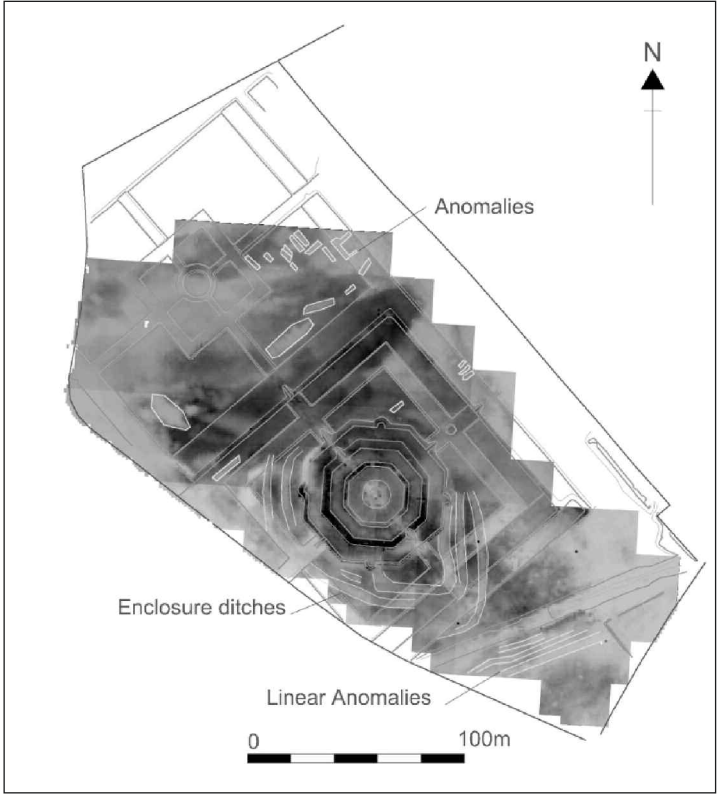


Figure 7. Some highlighted features of the resistivity survey.

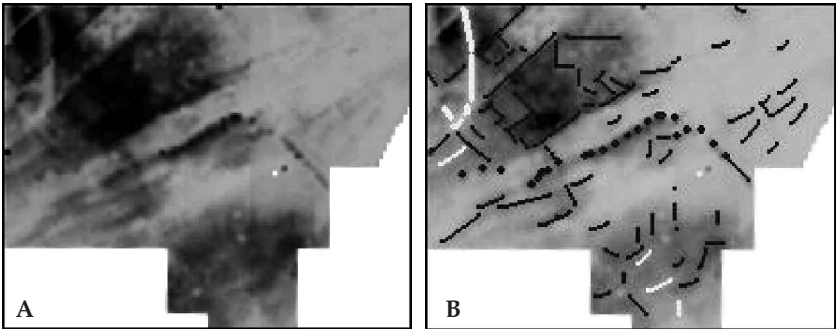


Figure 8. Detail south of the mound (A) and interpretation (B) (black and white: high and low resistivity respectively).

While the areas to the north of the stepped mound are somewhat obscured by overburden or the effects of waterlogging, the area to the south in contrast shows a wealth of detail (Figure 8).

Besides the large (low resistance) ditch many short linear high-resistance dark anomalies marked in black are evident in figure 8B. On the southern edge of the large ditch is a row of what appear to be large, independent stone blocks, possibly a stone revetment. The weak high resistance feature traversing the ditch is but one indication of building phases in this area of multiple (including recent) dates and potentially complex sequences of activity.

In the corresponding magnetic data, the main mound and its stepped structure again stand out very clearly, and around its east, south and west sides is the multivallate enclosure (Figure 9). The survey conducted on the golf course to the south east did not produce any sign of a continuation of the large open ditch (south of the Knot mound). This suggests that the ditch either terminated at, or runs beneath, the Dumbarton Road. Only stretches of (recent) field drains and an old boundary ditch were revealed on the golf range.

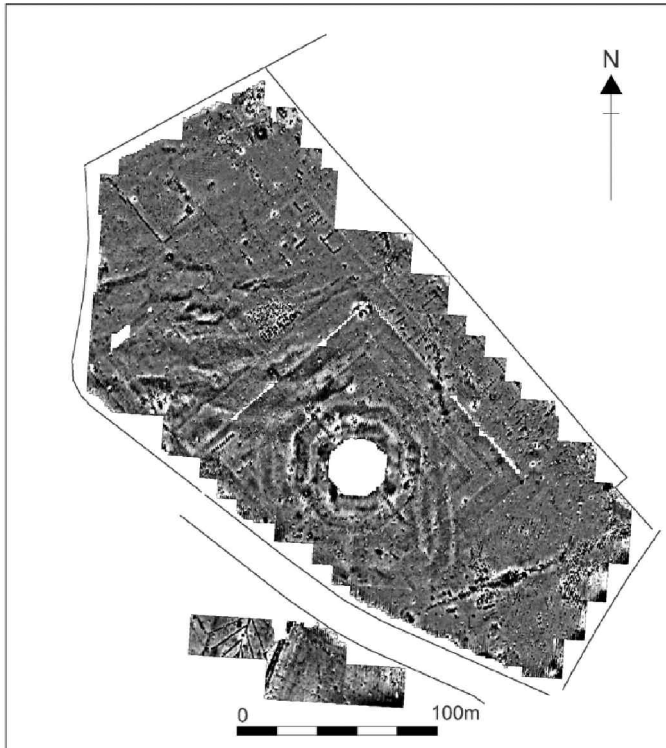


Figure 9. Magnetic survey results (black +10 nT and white -10nT).

A regular series of drains can also be seen running into the ditch on the eastern boundary of the King's Knot, while other segments of drainage are found near the Queen's Knot. The short rectangular anomalies seen in the resistivity survey are again visible. Also underlying the Queen's Knot are some irregular linear bands, running in broadly E-W directions. These can best be interpreted as natural irregular undulations in the ground surface, perhaps glaciofluvial channels. This is perhaps indicative of the lower lying area of the Queen's Knot having been scarped or truncated down into the natural during construction. One other significant feature in this area is a concentration of highly magnetic material just to the southeast of the Queen's Knot mound. Situated in what could be the very centre of the original garden there is a strong possibility that this could be the truncated base of a pond feature that has been filled with stone (Figure 10). Subsurface remains to the south of the main mound and the large E-W ditch are also evident.

The recent ground penetrating radar survey focussed on the multivallate monument and revealed good preservation of the ditches to the south and

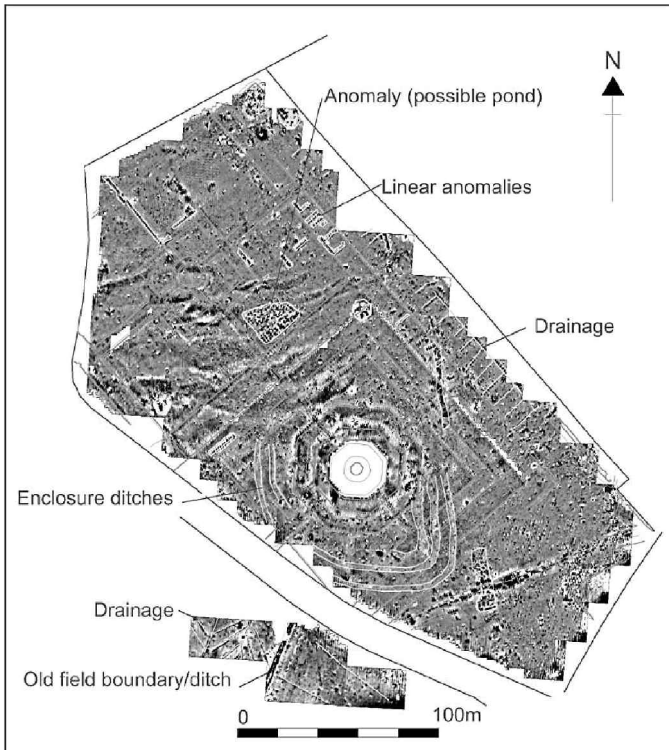


Figure. 10 Interpretation of some of the main features in the magnetic survey.

west sides of the stepped mound (O'Grady, 2012). Surviving below up to 1 m of overburden the outer ditch was found to be 3-3.5 m wide, while the inner ditches 4-5 m wide. This may indicate multi-period construction. With steep U-shaped profiles the depth of these ditches is approximately 1-1.5 m where well preserved, depleting to 0.5 m where truncated in the north. Profiles also indicate that bank remnants, accompanying the ditches, may also be present in the south. Some limited support for a possible entrance where the ditches appear to terminate abruptly on the east side of the mound was provided by the survival of historic soil horizons between the apparent breaks in the ditch system.

Interpretation

Combining the results of the geophysical and topographic surveys together with aerial photographs, historical maps and historical records it is possible to propose a sequence for the main developments of the King's Knot (Figure 11).

The earliest feature is likely to have been the triple-ditched enclosure which may have been the earthwork referred to as the 'Round Table' mentioned as early as the 14th century. It has the appearance of a prehistoric enclosure, possibly of Iron Age or early medieval date, but it is not impossible that it was a purposefully created as an archaic feature for David II in the 1360s or James IV in the 1490s. In outline, the three sets of geophysical data together with the aerial photographs collectively confirm the presence of the enclosure but at a detailed level each data set offers something different; this complex situation can only be resolved now by excavation.

The garden of James IV (1493-1513)

It seems very probable that the large southern ditch, which is mirrored in the crop field to the north, is part of a boundary ditch system which includes the eastern boundary ditch and probable ditch in the Butt Park to the north. It is possible that the northern and southern ditch were linked by a ditch now buried beneath the Dumbarton Road. Together these ditches form a large enclosure with a trapezoidal shape. The ditches and a length of linear bank may be all that is left of a bank and ditch perimeter to James IV's garden. It is also notable that the large southern ditch avoids the triple-ditched enclosure, suggesting that this monument was included as a garden feature. That the 'Round Table' is mentioned as late as 1529 would seem to support this. It is also tempting to interpret the highly magnetic feature at the very centre of the trapezoidal garden as evidence of a possible pond. The inclusion of a pond or fountain as a central feature was typical of the medieval garden. Given that the enclosed garden may have included a prehistoric monument, a pond, and wet area in the northwest, there is not a great deal of room for the rows of thousands of fruit trees reportedly planted by James IV's gardeners. It is therefore very likely that they were planted in and around the garden, on the Butt Park, Haining, and Brae, and perhaps on route to the Park Loch.

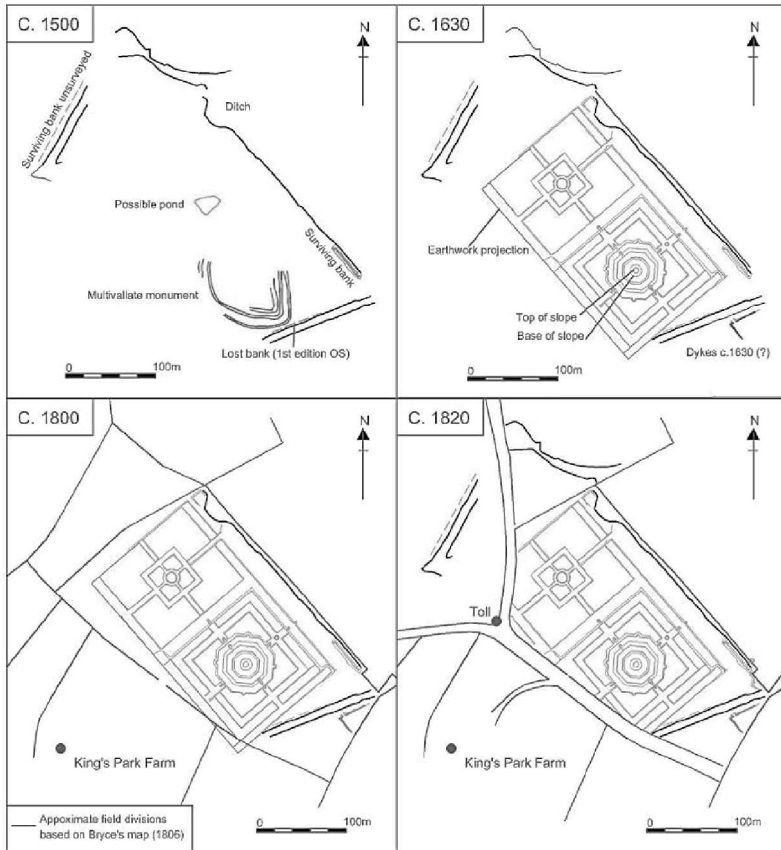


Figure 11. Interpretative scheme of main developments based on present evidence.

The garden of Charles I (c.1627-35)

The next major phase in the development of the garden that can be identified on present evidence is William Watt’s geometric earthwork. This was a radical redesign but it runs parallel to the earlier eastern boundary ditch which may have acted as a baseline for setting out. The possible pond was filled in, the prehistoric monument was erased or buried, and the old ditch in the south and west would have been partially backfilled and covered by the new garden earthworks.

Abandonment, decline, and preservation (c.1690-present)

By the beginning of the 18th century the garden was reportedly in neglect, and by the end of the century the King’s Knot had become part of a field

system. Historic maps of this period are useful guides for building a picture of the King's Knot as it became enclosed and partly lost to cultivation. Disturbance and truncation along the eastern flank of the Knot suggest some quarrying for sands and gravels may have occurred. This could be related to the construction of the Dumbarton and Raploch Roads which dissect the western and northern edges of the Knot. Restoration in the 1860s marked a desire to protect the monument from further damage and safeguard it as a permanent feature of the Stirling landscape.

Conclusion/Future work

This survey has demonstrated the value of integrating a non-invasive approach in the field, based on geophysical, topographic and aerial survey, with study of early maps and historical records relating to King's Knot. The geophysical surveys have provided useful, interpretable results which extend what is visible in the aerial photographic record. In particular, they have been able to offer the time depth that is necessary in understanding the long history of King's Knot.

Methodologically, the geophysical survey has been a very good exercise in demonstrating the importance of adopting a multi-technique approach. For instance, both techniques detected good detail of the ditches around the main mound, yet because of the ground conditions at the northern end of the park resistivity was not performing optimally, while at the southern end this technique was more effective than magnetometry.

At the risk of generalising, magnetic survey has proven more popular and effective than resistivity in Scottish archaeology; the former usually provides more informative results than resistivity, and it is a more rapid technique. The experience at King's Knot, however, shows that where conditions favour resistivity, as they have done here, the technique works well. A comparable situation occurred at Dunkeld in the geophysical survey of the Duke of Atholl's garden estate adjacent to the Cathedral (Kellogg and Jones, 2006); whereas it was initially expected that the magnetic survey would be productive, in the event resistivity provided much more detailed information (Kellogg and Jones, 2006, Figure 22.4a-d).

Ground-penetrating radar has certainly had a role to play at King's Knot, complementing well the picture of the ditched enclosure around the main mound obtained from magnetic and electric survey. As well as supplying depth estimates GPR indicates good survival of buried ground surfaces and archaeological deposits beneath the surface earthworks (O'Grady, 2012). There is potential for further survey, notably in the area immediately south of the mound where better definition of the ditches would be valuable. This could be achieved by a combination of higher resolution resistivity survey and GPR experimenting with antennae of lower frequency. Potential building remains detected south of the Knot would also benefit from higher resolution resistivity survey.

Ultimately, however only a series of excavations to test the findings of this survey can provide detailed information on phasing, construction sequences, and former activities that took place at the King's Knot. Such a step could provide some exciting insights into the origins and a purpose of a prehistoric monument, one which may have subsequently played some significant role in the ceremonies of Scottish kings. It would also lead to an understanding of the development and uses of a High Renaissance garden and royal landscape of leisure which is of European significance.

Note: The winter storm of December 2011, brought down one of the two mature hawthorns that stood near the surviving bank and ditch east of the Knot. This provided an opportunity to test a suggestion that these may have been survivors from the 16th century garden. Dendrochronology however proved that they had in fact been planted in the late 19th century (Mills, 2012).

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