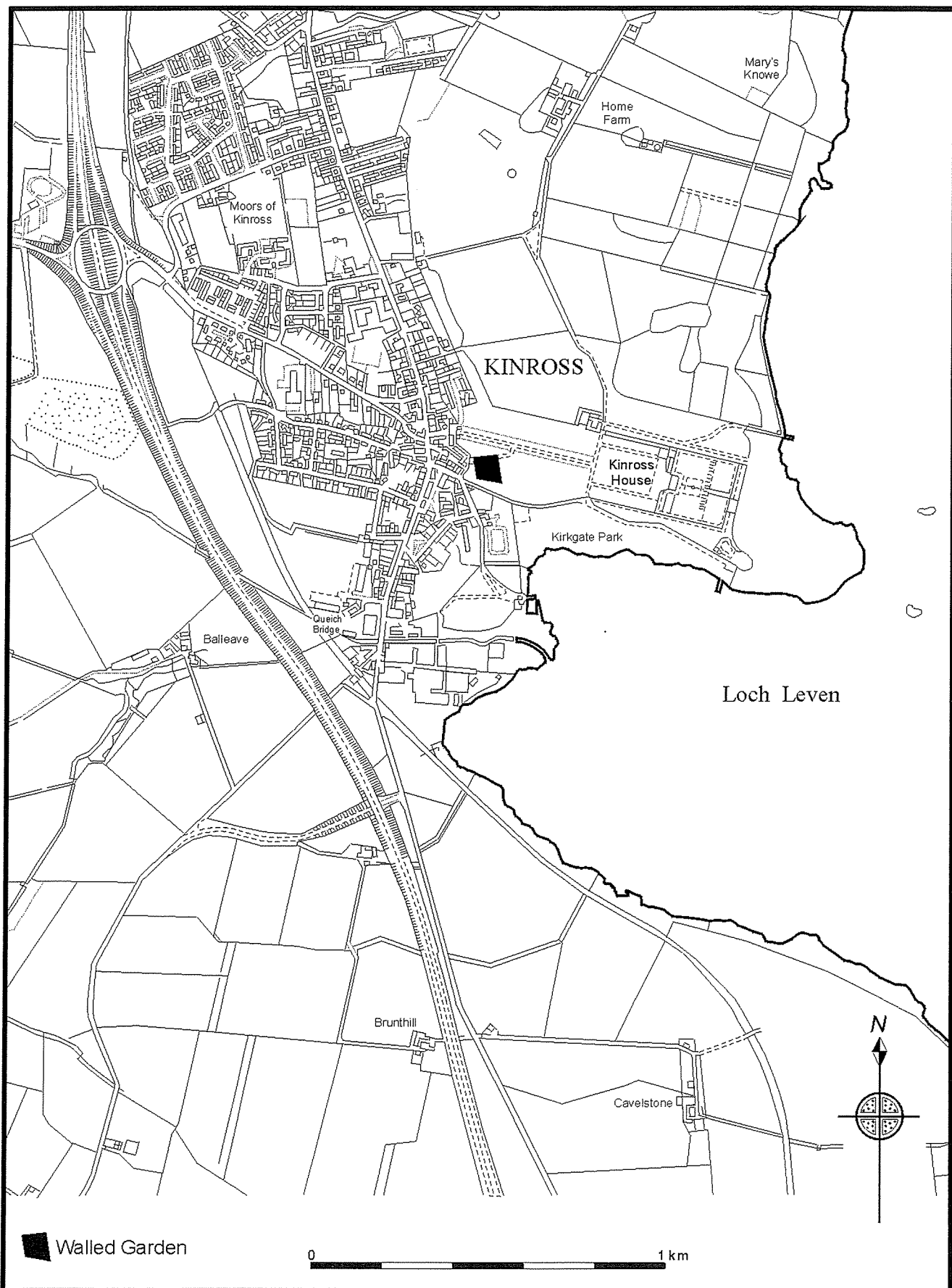




Illus 1 Site location map. (Crown copyright)

The archaeology of a walled garden at Kinross House

Adrian Cox

Introduction

In 1994, SUAT carried out an archaeological evaluation of a derelict walled garden in the grounds of Kinross House, in advance of its development by The Children's Hospice Association Scotland. The purpose of the evaluation was to establish the nature and survival of features relating its past uses and layouts. Although the results of the evaluation were limited, a series of detailed observations made at the time, and subsequent research, have shed further light on the character of this garden and helped to establish its place in the history of Scottish kitchen gardening.

Site location and description

The site of the walled garden (NGR NO 1215 0212) lies towards the western edge of the grounds of Kinross

House, between the burgh of Kinross and Loch Leven (Illus 1 and 2). Some of the features described here have been incorporated into the new development, while others were removed. The garden was not quite rectangular, but had almost parallel walls on its east and west sides, each forming a right angle with the north wall. The south wall of the garden formed an obtuse angle with the west wall, its alignment similar to that of the main axis of the grounds. Entrance to the garden was via a rectangular doorway built into an angle in the east wall. Another entrance, long disused, lay in the south-east corner. The walls are approximately 3.2m in height, and both the east and west walls (the latter removed during the site's development) incorporated a stepped profile.

Adjoining the north wall, on its northern side, are two ashlar-built gazebos with domed, slated roofs.



Illus 2 Aerial photograph taken on the 23rd May 1972. The walled garden is on the left of the picture. (Crown copyright Ordnance Survey. All rights reserved)

Neither is accessible from inside the garden. The eastern gazebo appears to have been built at the same time as the east wall of the garden, although the north wall appears to be a later addition. Built against the south-facing side of the north wall were a flat-roofed, brick summerhouse or gazebo, of equal height to that of the wall, and a series of five large, span-roofed glasshouses, almost 4m in height. Although the area within the walled garden sloped only gently towards the south, the ground sloped steeply beyond the south wall, towards Kirkgate. This steep drop in ground level may indicate that the southern end of the garden had been built up by importing soil.

At the time of the archaeological evaluation, the garden was entirely overgrown. The summerhouse and the entrance doorways were obscured by vegetation, and the glasshouses had collapsed. Subsequently developed, the site is now home to Rachel House, the first children's hospice in Scotland. The building was opened by the Princess Royal in 1996 and won a major architectural award the following year.

Historical background

Kinross House itself is the finest and best-preserved example of a group of houses designed by Sir William Bruce (1630–1710) according to Palladian principles. A landowner and diplomat, Bruce was also a very capable architect, who altered a number of towerhouses to make them more symmetrical in keeping with the taste in northern Europe, before embarking on new houses such as Kinross House and Dunkeld House (the latter demolished in 1830). Bruce bought the Kinross estate from the Earl of Morton, whose forebears had controlled Loch Leven Castle. The peninsula here had been used as the embarking point for Castle Island, and the 'Old House' of Kinross stood on the foreshore, a short distance to the north-east of the present house.

Such was the emphasis Bruce placed on the relationship between house, landscape and grounds that the making of the gardens often began in advance of the actual building, as happened at Kinross House and also with the designs for Craighall, west of Edinburgh, where Bruce urged Lord Annandale to plant trees and hedges ahead of building work. Bruce also designed Hopetoun House, West Lothian, and references to work on the 'kitchen yeard' occur there shortly afterwards (Robertson 1998, 132).

Daniel Defoe, who toured Scotland in the early 18th century, says of Kinross House 'This is by much the finest seat I have yet seen in Scotland. It is built of Free Stone, adorned with columns of the Corinthian order; the offices under ground are all vaulted, and galleries of communication paved with stone are the noblest I have seen anywhere' (Defoe 1726). The series of forecourts, gardens and policies surrounding Kinross House demonstrates Bruce's talent for formal planning on a grand scale (Walker and Ritchie 1987, 75). Work began on enclosing, draining, levelling and planting the gardens in around 1679, and they had taken shape by 1686.

In 1700, Bruce gave Kinross House to his son John, but the house passed out of the family in the late 18th century. It was sold to Thomas Graham, whose daughter married Sir James Montgomery. Between 1819 and 1881, the house was empty, though the policies continued to be managed and planted. Sir Basil Montgomery (1852–1928) came to live in Kinross House with his family in 1902, and began the task of restoring the house and re-making the gardens (Jamieson 1993).

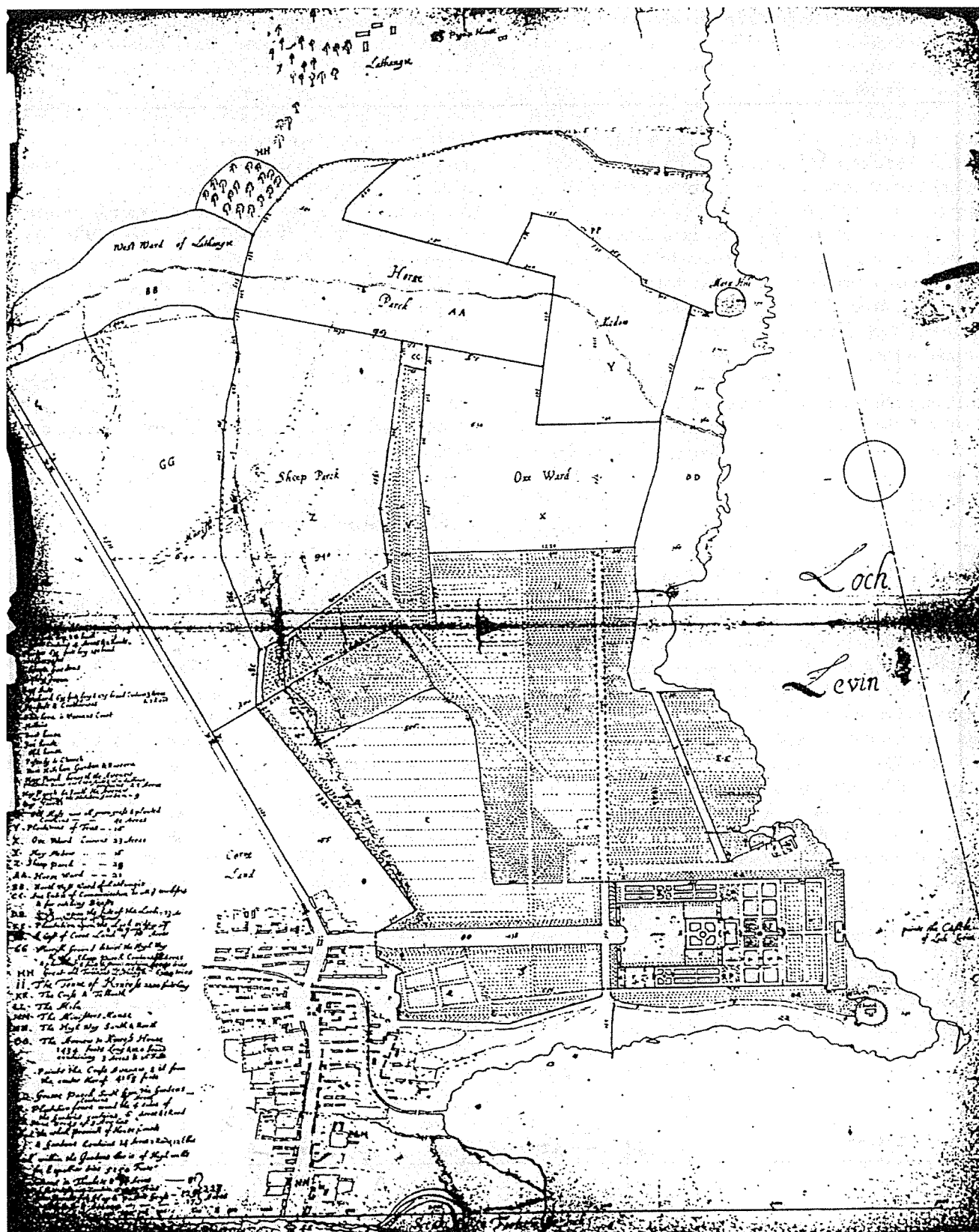
A plan attributed to Alexander Edward, thought to be more or less contemporary with the building of Kinross House (Illus 3), shows a garden on the site under investigation, with the appellation 'New kitchen garden and nurserie'. Few details are depicted, although intersecting pathways are shown, dividing the garden into quarters. However, although Kinross House and its grounds are shown on several 18th- and early 19th-century maps of the area (including Roy's military survey, John Ainslie's map of 1775, John Bell's map of 1796 and Sharp, Greenwood and Fowler's map of 1828), the kitchen garden is not depicted. One possible explanation of this is the lack of fine detail on several of these maps, along with their relatively small scale. Evidence from Ordnance Survey maps from the 1850s onwards is more decisive. There is no evidence of the kitchen garden on the six inch map of 1854, and neither does any trace of it appear on the First Edition 1:2500 map of 1896. A garden appears for the first time on the 1:2500 map of 1915.

The appellation 'New kitchen garden and nurserie' on Edward's plan may suggest that this garden replaced an earlier one, possibly associated with the 'Old House' of Kinross. The garden may not, at that time, have been enclosed by walls, as its external boundary is shown as a dotted line rather than the solid line one might expect for the depiction of walls. Its absence from later maps may lend support to this possibility. A further possibility that merits consideration is whether the garden was in existence at the time of Edward's plan, or a planned addition.

In recent times, the walled kitchen garden under investigation supplied produce to Kinross House, until 1955 when its use became uneconomic and it was largely abandoned (D Montgomery, pers comm). Parts of the garden were used as a forest nursery and allotments as recently as the early 1970s, as an aerial photograph taken in May 1972 shows (Illus 2).

History and development of kitchen gardens

Forbes W Robertson (2000, 141–52) discusses in detail the evidence for gardens in 16th- and 17th-century Scotland, and concludes that, by the second half of the 17th century, when Kinross House was built, there was a substantial body of trained gardeners in the country. Their antecedents could be traced back to the medieval monastic institutions, where botanical knowledge and gardening skills had been fostered, owing partly to their dependence on a predominantly vegetarian diet and their medical expertise, not only for the benefit of the brethren but also the population at large.



Illus 3 A late 17th-century plan of Kinross House and its grounds, attributed to Alexander Edward.

After the dissolution of the monasteries in 1560, skills in kitchen gardening and orchard management, once promoted by the church, would have been vested in those who formerly supplied the monasteries and abbeys with a variety of garden produce. During the 17th century demand increased for trained gardeners to serve the land-owning classes, who desired orchards and gardens in order to authenticate their status as country gentlemen (ibid, 141).

Walter Macfarlane's 18th-century descriptions of Scotland indicate that a majority of the castles and country houses were embellished with gardens, orchards and 'yards'. Archaeological evidence presented by Niall Hynd (1984) lends support to the view that gardens were already well established at an earlier date, as it identifies a large number of garden sites dating from the 16th, and especially the 17th, centuries.

At Aberdour, a garden was already well established by the late 16th century, and archaeological work there identified evidence of earlier terraced gardens of 16th-century date (Robertson 2000, 147). Despite short-lived disincentives, especially in times of conflict, to create gardens, some notable examples appeared during the 17th century, for example the terraced garden at Moray House in Edinburgh and the three-acre walled garden created by the Earls of Seton at Niddry Castle in West Lothian. Wide-ranging improvements to existing gardens included those at Coltness in Lanarkshire (Robertson 1998, 130–1). By the time Kinross House was built, interest in gardens had long been flourishing, and with it a skilled workforce able to carry through and maintain elaborate planting schemes.

Continental influences on gardens at the end of the 17th century led to the establishment of parks beyond the formal gardens themselves. Long views across the formal gardens were sometimes continued across adjoining parkland to create vistas. By this time, some country houses were surrounded by policies which included woods, walks, formal ponds, wildernesses, stone walls, hedges and avenues, liberally ornamented with statues, summerhouses and garden seats. In addition to the formal gardens, there were often orchards, separate cherry gardens and well-stocked kitchen gardens complete with hotbeds and, in due course, glasshouses. The entrance from the formal gardens into the kitchen garden would sometimes be through an ornamental gate, and visitors could walk through the garden along paths lined with low hedging, herbaceous beds and espaliered fruit trees.

In the late 17th century, there were fine kitchen gardens in the grounds of Hamilton Palace, Lanarkshire. These had been laid out in the 16th century but were overhauled from the 1660s onwards. The fruit from these gardens was particularly celebrated. Dwarf and espaliered fruit trees were introduced into Britain in the latter part of the 17th century. The publication, in 1863, of John Reid's treatise *The Scots Gard'ner*, thought to be Scotland's first gardening book (Robertson 1998, 131), was a reflection of the healthy state of gardening in Scotland at that time.

Documentary evidence relating to the purchase of plants for gardens in the late 17th century reveals the extensive range of items available. For example, Sir John Fowlis's accounts relating to purchases for his gardens at Ravelston near Edinburgh mention seed peas, seeds for parsnip, turnips, beets, carrots and radish. There were also leeks, Flanders and Strasbourg onions, and syboes, artichoke slips, spinach, lettuce and cauliflower. Soft fruits included redcurrants, gooseberries and strawberries. Cherry and pear grafts were also ordered (Hallen 1894). Contemporary accounts for orders for Hopetoun, Taymouth and Gordonstoun reveal a similar story, and the gardens were supplied from similar sources (Robertson 1998, 136). Forbes W Robertson (2000, 15–34 and 105–40) discusses in detail the types of plants grown in 17th-century Scottish gardens.

Both the finest vegetables for the dining room table and the choicest fruits for the dessert plates were cultivated in the walled kitchen garden. As Davies (1987, 11) points out, the head gardener, whose inner sanctum this was, had to answer the call for strawberries in the winter and salads all year round in sufficient quantity to cope with any number of unexpected house guests and their servants. The plants which filled the borders in the pleasure grounds had to be started, wintered and nurtured in the walled garden, and exotic flowers for the table could be grown under glass.

High fruit walls enclosed and protected kitchen gardens of the 18th and 19th centuries. The gardens were traditionally divided into quarters, and occasionally the quarters were themselves divided into smaller plots, as depicted by Thomas Hitt (1757, 20–35 and Plate 1) in a mid 18th-century plan. Both the plots and the quarters were commonly bordered by fruit trees. Several gardens constructed in the 18th century can be visited today, for example those at Castle Howard, Yorkshire and Blenheim Palace, Oxfordshire. Both of these were designed by Vanburgh (Campbell 1998a, 27), although the gardens at Castle Howard were subsequently enlarged.

The *Statistical Account* of the 1790s includes references to gardens at every level of society. Not long after this, in 1813, Dr Patrick Neill asserted that 'In no country is the management of the kitchen garden better understood, or more carefully attended to, than in Scotland, and nowhere are culinary vegetables produced in greater variety or perfection than in the kitchen gardens of the Scottish nobility and gentry.' (Robertson 1998, 129).

At the turn of the 19th century, new plants were arriving in Europe in greater and greater numbers. The Horticultural Society, founded in 1804 and later to become the Royal Horticultural Society (1861), increased its influence by commissioning explorers, travellers and merchants to obtain plants from overseas. Throughout the Victorian era, collectors were bringing new and exciting plants into the country and experiments were being undertaken to introduce new fruit varieties. Landowners and their gardeners would vie with each

other to produce the earliest and best vegetable crops. Charles Dudley Warner summed up the Victorian enthusiasm for gardening in a passage from his *My summer in a garden*, in 1876:

‘The things I may do in my garden multiply on my visionCan I raise all those beautiful varieties, each one of which is preferable to the other?’

During the 18th and 19th centuries, productive kitchen gardens in the policies of Scottish country houses provided garden produce for most, if not all, of the year. As horses provided the main means of transport, manure was plentiful, and labour was also cheap. However, as the railways developed, allowing produce to be transported more rapidly, market gardening gradually expanded away from areas of population. Later, road transport further facilitated the wide distribution of produce. Consequently, home vegetable production declined, although it was fostered at times of high prices and food shortages, particularly during the ‘Dig for victory’ campaign of the Second World War (Pople 1992, 11).

Archaeological results and observations

The main objective of the two-day archaeological evaluation was to determine the nature and survival of features relating to past uses and layouts of the walled garden. It was hoped that information might survive which would enhance existing knowledge of garden design and plant history. In order to minimise disturbance to structures and plants within the garden, a lightweight mini-excavator was used to open a series of narrow trial trenches.

Four shallow evaluation trenches (A, B, C and D), each 1m in width (Illus 4), were excavated by machine and by hand. Three of the trenches (A–C) were oriented diagonally within the garden in order to cross as many features as possible. The purpose of Trench D was to investigate one of the paths through the garden and enable its recording in section. Garden features located outwith the four trenches were also recorded, along with other relevant observations, and a photographic record was made of a selection of the surviving structural features. The limited results from the four evaluation trenches are summarised below.

Trench A (Illus 4)

This trench, 1m in width, was oriented diagonally between the south-western and north-eastern corners of the garden. With an overall length of c 56m, this was dog-legged slightly in order to avoid damaging a short length of modern fencing. The trench was excavated to a depth of c 0.15m initially, to remove turf and expose garden soil deposits. These were cleaned by hand and investigated to a depth of c 0.25m. The trench cut through a deposit of clinker, slag and ash, 2.20m in

width, at a depth of 0.08m below the modern turf and topsoil. This represented part of a path, running north to south through the garden, from the small, flat-roofed summerhouse built against the northern wall, to the southern wall. The path was recorded in section (Illus 5).

Three short sections of Trench A, one of 3m in length and two of 2m, were further excavated in order to investigate the underlying garden deposits and to expose the natural subsoil. Below the modern topsoil layer was a sandy loam deposit containing small, rounded and angular pebbles and root debris. This appeared to represent a cultivated garden soil. It was well-aerated, with small to medium-sized peds, and appeared to be well-drained. A clay pipe bowl dating from c 1670–1700 was recovered from the garden soil near the eastern end of Trench A. This bowl (Illus 6) has a basal mark of a star, a motif used by various Stirling pipemakers (Gallagher and Harrison 1995, 1134). Its highly bur-nished surface and the careful milling of the rim indicate that it is a high quality product (D Gallagher pers comm). The path overlay this cultivated garden soil deposit.

Below the garden soil was a natural subsoil deposit, a silty sand, below which was natural gravel. The garden soil deposits were of varying depth; natural subsoil being encountered at a maximum of c 0.9m below the ground surface.

Trench B (Illus 4)

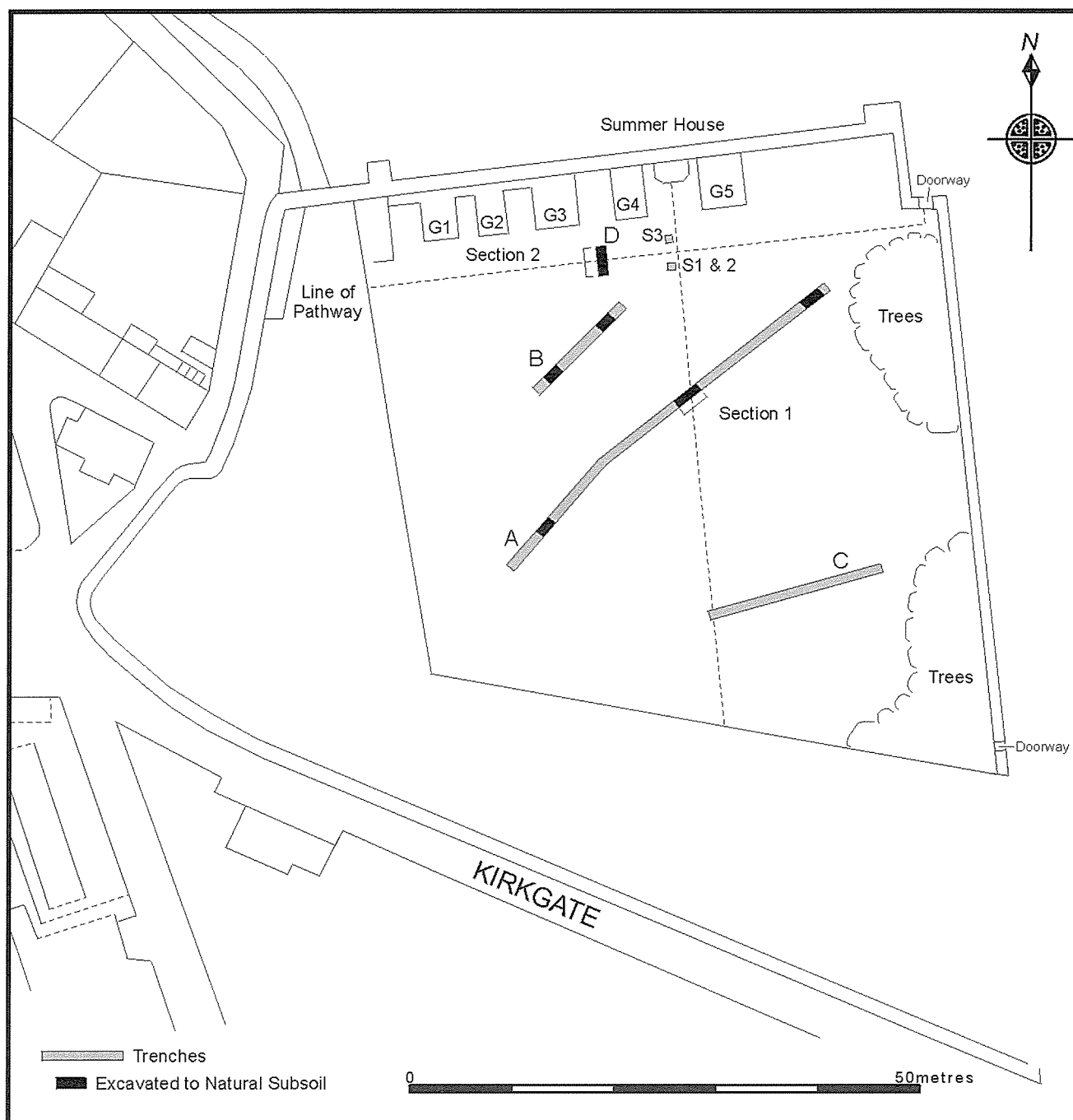
Trench B was located to the north-west of Trench A and aligned roughly parallel to it. The trench was 1m wide and 14.2m in length, and, like Trench A, was excavated by machine and then by hand. The garden soil deposits were very similar to those encountered in Trench A, although there was evidence of more recent cultivation. Two short lengths of the trench were excavated by hand to reveal natural subsoil at a depth of c 0.8m below the ground surface.

Trench C (Illus 4)

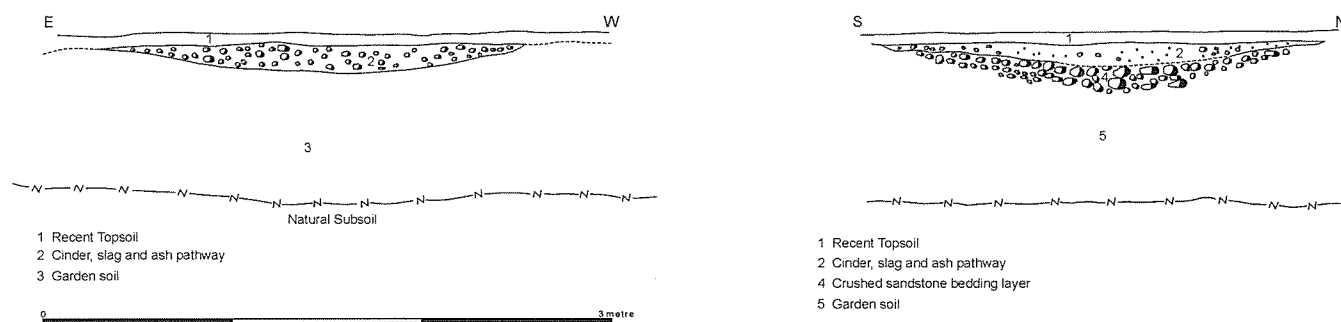
This trench was located in the south-eastern corner of the garden and excavated in the same manner as Trenches A and B. It was 1m wide and had a length of 19.3m. The western end of this trench cut through the line of the north to south pathway encountered in Trench A. Other than this, no features were observed. A short length of the trench was excavated by hand to a depth of c 1.1m below the ground surface. Stony garden soil deposits were encountered at this depth, indicating deeper cultivated soil deposits in the southern part of the garden than elsewhere. The natural subsoil was not reached, indicating that it sloped towards the south.

Trench D (Illus 4)

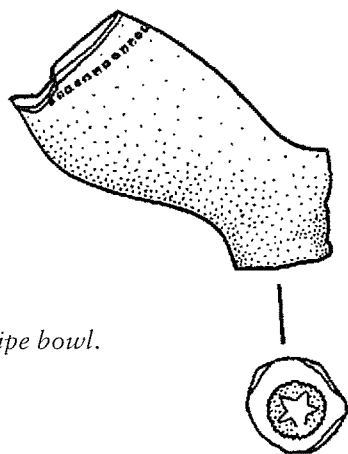
Trench D, 1m wide and c 2.8m in length, was located in the northern part of the garden to investigate a path running east to west. This was recorded in section



Illus 4 Location plan of archaeological evaluation trenches and garden features.



Illus 5 Sections through north-south path (Trench A) and east-west path (Trench D).



Illus 6 Clay pipe bowl.
Scale 1:1.

(Illus 5). Below the cinder, ash and slag make-up of the path was a bedding layer composed of crushed sandstone fragments. This was not present in the make-up of the north to south path encountered in Trenches A and C. The dimensions of the two paths were very similar, however. Below the crushed sandstone bedding layer were garden soil deposits similar to those encountered in Trenches A–C but containing larger quantities of charcoal fragments. These deposits overlay the natural subsoil, which was encountered at a depth of c 0.9m below the ground surface. No features were observed below the path deposits.

Subsequent to the evaluation, a low, linear bank was identified c 20–25m to the east of the garden. This has a height of c 1m and a width of 3–4m, and is aligned at an angle to the east wall of the garden, diverging from it towards the south.

Position, layout and content of the garden

Lying near the western edge of the grounds of Kinross House, the kitchen garden lies at some distance from the house itself, and a plantation of trees to its east shields it from view. The removal of the kitchen garden to a distance from the house is a common pattern which began to emerge in the 17th century, for reasons of aesthetics, access, and due to the different cultivation methods required for different types of plants. The high walls of kitchen gardens could also interrupt the views from the house unless there was some distance between the two. However, as Campbell (1996, 23–4) notes, kitchen gardens were not generally hidden from the main vantage points of the house and grounds until they began to increase in size.

William Lawson, author of *The countryside housewife's garden* in 1618, was among the first to suggest that there should be two gardens, a flower garden and a kitchen garden, partly because they required 'divers manners of husbandry' (Campbell 1998a, 16). Much later, Robert Thompson's (1878) advice to his readers (assumed to be owners of extensive properties) was that the kitchen garden should be so near the house 'as to be conveniently accessible on foot, probably

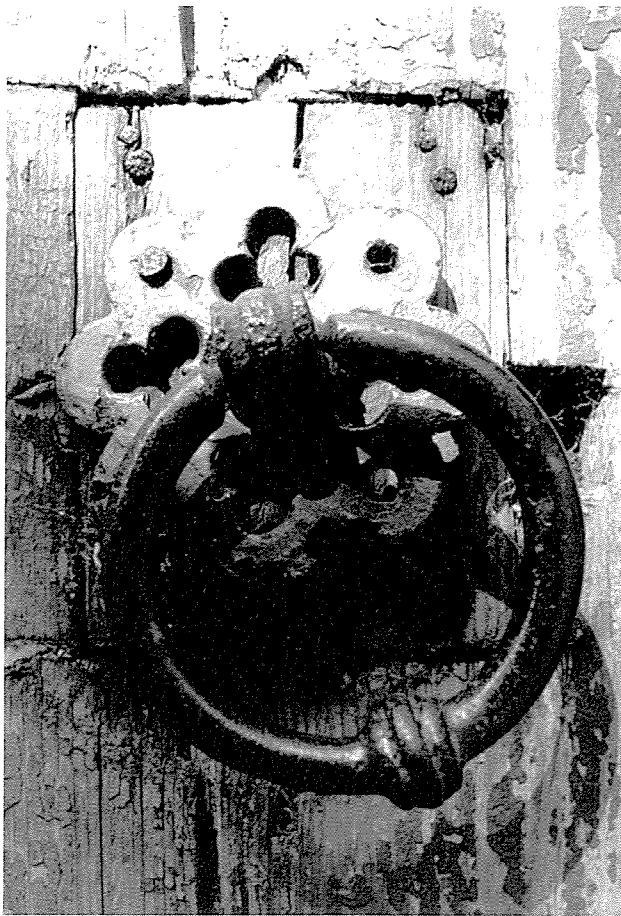
within little more than a quarter of a mile; while it should be so distant as to avoid the possibility of offence arising from the necessary gardening operations, and the resort of workmen'.

The kitchen garden at Kinross is shown as being divided into quarters on the late 17th century plan attributed to Alexander Edward (Illus 3), and the archaeological evaluation revealed a similar arrangement in more recent times (Illus 4). The layout of kitchen gardens, with grid-like paths dividing the open ground into 'quarters' (cultivable compartments) is an ancient design that enabled the soil to be worked on and watered by the simplest and most direct means (Campbell 1998a, 9). It is a layout that would have been familiar throughout the 17th to 19th centuries, and is still adhered to today. The quarters were planted in rotation with various brassicas, legumes, onions and root crops. Kitchen gardens require fertile, well-drained soil, and a gentle, south-facing slope (as in this case) is preferred, as it makes the best use of a sunny aspect, maximising solar gain. The slight slope also facilitates irrigation and drainage.

During the archaeological evaluation, unattended clusters of raspberries, strawberries, gooseberries, roses, potatoes and various herbs were recorded in the western part of the garden, although these represented recent crops. Estate staff used part of the garden as allotments after 1955 (D Montgomery, pers comm), and the western part was under cultivation as recently as the early 1970s (see Illus 2). During the time that this garden supplied the house with produce, the levels of activity and noise associated with gardening may have discouraged some birds and animals from visiting the garden, despite its obvious attractions. However, even after it had long been abandoned, a variety of wildlife may have been attracted to this sheltered location. Numerous butterflies, including Meadow Brown (*Maniola jurtina*) and Ringlet (*Aphanotopus hyperantus*), two resident species that often inhabit grassland and woodland margins (Thomson 1980, 191, 201) were observed during the evaluation work.

The walls

The high walls enclosing the kitchen garden served both to screen the internal gardening operations from the house and formal grounds, and to create a favourable microclimate within. The walls are built mainly of brick, and examination of damaged sections of wall revealed that the bricks are stamped with the legend 'MUIR ARMADALE'. The RCAHMS records a cluster of brickworks in the Armadale area (Douglas and Oglethorpe 1993, 50, Fig G2), including the Etna Brickworks, manufacturing bricks from c 1897 onwards, the Atlas Brickworks, in production from 1882–1973, and the Barbauchlaw Brickworks, in production from c 1893–1971. It would therefore seem likely that the garden walls were built, or possibly re-built, as part of Sir Basil Montgomery's remodelling of the gardens from 1902 onwards. The doorway through the east wall was



Illus 7 Photograph of decorative door handle at the entrance to the garden.

fitted with an ornamental handle dating from this period (Illus 7).

As Campbell (1996, 51–2) notes, brick walls acted as strong, durable, dry and heat-retentive supports for fruit trees. In the account of his early 18th-century travels through Britain, Daniel Defoe (1726, 49–50) remarked that, without brick walls, good fruit could not be grown in Scotland, as stone walls did not reflect the sun's warmth so well. The mortar between the bricks is often pitted with nail holes, as it is in places here at Kinross. This is a legacy of the careful training of fruit trees. In walled gardens in some parts of Britain, the sun on the south-facing wall was warm enough to ripen peaches and nectarines. Here, these fruits, along with figs, were grown in the glasshouses (D Montgomery, pers comm).

Enclosing a garden with walls necessitated considerable expense. Robert Thompson (1878) estimated that to enclose an acre of land with a fifteen-foot high wall would cost £552, on the basis of bricks costing £12 per rod (5 metres). Walls were also expensive to maintain, as constant nailing and re-nailing of the branches of fruit trees destroys both bricks and mortar. Techniques for nailing the branches were described in detail by Charles McIntosh, who also discussed the preferred height, colour and materials of garden walls (1852, 352–3; 1853, 65–107).

Here at Kinross, the eastern wall of the kitchen garden is externally faced with stone, and stone has been used in combination with the brickwork, particularly around the entrances. It seems possible that this wall, which is the one most visible from the house and formal grounds, was faced with stone so that its appearance was in keeping with that of other buildings and walls in the grounds.

The protective value and warmth of the walls could be lost if cold winds managed to enter the garden. Sometimes windbreaks of tall, quick-growing trees were planted outside the garden walls, particularly on the northern and eastern sides, to prevent this. The southerly and westerly aspects were usually kept more open, to maximise solar gain. Here, a screen of closely-spaced holly trees to the east of the garden protects it. Solid wind barriers are, nowadays, frowned upon, as they are thought to deflect the wind upwards and create turbulence behind the barrier. Recent research indicates that materials around 50% permeable, such as a holly, beech or conifer hedge, are ideal for slowing the speed of the wind, thus avoiding both deflection and turbulence (Walls 1983, 17–19).

The six-sided summerhouse or gazebo built against the south-facing wall of the garden, adjacent to the glasshouses, was in an overgrown and dilapidated condition at the time of the archaeological evaluation, but was cleared of vegetation sufficiently for limited photographic recording. It had a flat roof, a stone-faced, south-facing rectangular doorway and windows in its east- and west-facing walls, looking out diagonally across the garden and surmounted by rounded arches. The entrance opened directly onto the north–south path revealed during the evaluation. Kitchen gardens were attractive to their owners and to visitors alike, and their high walls made them sheltered for walking in. Gardens of all kinds can impart a peaceful atmosphere, conducive to relaxation and meditation. The addition of garden seats, or, in this case, a small, south-facing summerhouse, would have enhanced the benefits of the peaceful and relaxing setting. However, a contrasting view was offered by W S Rogers (1902), who wrote of summerhouses: 'The mere mention of them brings to mind a vision of damp boards, earwigs, spiders and mildew'.

Glasshouses

A series of five glasshouses of timber-framed, span-roofed construction (see Illus 8), had been built against the south-facing wall of the garden, four lying to the west of the summerhouse and one to its east. The glasshouses had collapsed, mainly due to the failure of one or more roof timbers, and were heavily overgrown internally. However, sufficient structural detail survived for some observations to be recorded.

Each glasshouse originally stood to a height of almost 4m. The buildings were not of uniform width, but their widths all lay between 6.5 and 7.5m. The bottom 0.8m of the front and side walls were of brick (the



Illus 8 One of the glasshouses adjacent to the north wall of the garden.

same type used in the garden walls), while the garden wall itself formed the back wall of each building. Rectangular-framed doorways formed single entrances to each glasshouse at their southern ends. Visible within each were parts of collapsed wooden staging, underneath which shade-loving plants could be cultivated. Sections of copper piping, remnants of the original heating system, survived beneath the staging, directly adjacent to the brick walls. An associated furnace and boiler survived in the north-west corner of the walled garden, although these appear to have been removed during the site's development. Guttering had been fitted to the glasshouse roofs, so that rainwater could be collected in a water butt by means of a downpipe and used for watering plants.

In two of the glasshouses, thin wooden strips, some connected by cord, lay on the floor; remains of the shading blinds which would have been used to regulate the amount of direct sunlight entering the buildings. The blinds appeared to have been hoisted on roof pulleys. Parts of the apparatus for opening and closing the glass roof panels to regulate ventilation also survived. The mechanised ventilation system used here appears to have involved pulleys, levers and cogs, operated by turning a handle set beside the staging, immediately inside the entrance doors. Using this mechanism, a range of hinged panels in the upper part of the glasshouse roof could be opened or closed. Lightweight wire grilles, fragments of which were observed on the glasshouse floors, may have

been used when the glass panels were open, in order to exclude birds.

Messrs. Mackenzie and Moncur Limited, who had offices and works in Edinburgh, Glasgow and London, include Sir Basil Montgomery of Kinross House in their list of patrons (1907, List of Patrons, 11), and published sketches of span-roofed, brick-based glasshouses similar to those recorded (*ibid*, 100). It is therefore most likely that the glasshouses, like the garden walls, date from the period of Sir Basil Montgomery's remodelling of the gardens from 1902 onwards.

The glasshouse or greenhouse has a long and complex history dating back to the 16th century, when such an enclosed and warmed space might be termed a 'stove', since it contained some form of heating apparatus. Seeds could be germinated earlier or more successfully in a glasshouse than in the open, and some seedlings from outdoor sowings could be transferred to the glasshouse during the winter and replanted outdoors in the spring, so gaining a better chance of survival. Crops of fruit and vegetables could be enjoyed out of season, either earlier or later than would otherwise be possible (Hellyer 1993, 406).

The concept of glasshouse gardening arrived in Britain from France and the Netherlands, and there were early successes at the Physic Garden at Oxford, where the buildings were of wooden construction and heated by portable, coal-filled braziers (Walls 1983, 11–12). Initially, glasshouses could only be afforded by the very

wealthy, and their development in Britain was slow until the tax on glass was repealed in 1845. Before this date, a crate of crown glass cost £12, but by 1865 the price had fallen to £2 8s (*ibid*, 12). Also influential was the major improvement in the manufacture of glass panes that followed the introduction of James Hartley's sheet glass process in 1847, making possible the general use of large sheets of glass rather than numerous small panes. Following these developments, enthusiasm for glasshouses grew rapidly, both among the aristocracy and the middle classes, who could also now afford to erect glasshouses. Manufacturers began to offer for sale a broad range of designs. Another major breakthrough occurred with the development of hot water heating for glasshouses.

As here at Kinross, the usual arrangement of glasshouses was along a south-facing wall, although often they were of lean-to construction rather than being span-roofed. Having the south-facing wall of the glasshouses built of brick, along with parts of the remaining sides, meant that the buildings would lose less heat in cold weather and gain heat more rapidly in sunny weather. Possibly there would have been sufficient light under the staging for shade-loving plants to be grown. Alternatively, this area could be blacked out for forcing and blanching vegetables (Hay 1980, 140). Free-standing, span-roofed glasshouses date from the early 1800s. During the 19th century they were used to force flowers such as roses, camellias and carnations, as well as forcing vegetables and accelerating the growth of fruit trees, including dwarf vines, apricots, plums, gooseberries and cherries (Campbell 1998b, 111–2).

Ventilation was used to control both temperature and atmospheric moisture levels. While ventilators in the lower part of the glasshouse were opened to keep a steady stream of air flowing around the plants, the adjustable panels in the roof allowed the release of air that had been heated by the sun. These panels, as well as the door, may have been left fully open on warm summer days.

As well as making good use of the sun's energy, glasshouses were furnished with a variety of heating systems. After early attempts at heating using coal-filled braziers (see above), glasshouses were heated by hot air flues between the 1700s and the 1820s and then, briefly, by steam. Finally, systems employing furnace rooms, boiler houses and hot water pipes were used, as here at Kinross. The hot water pipes could be placed low down within the glasshouses (as here) or slung overhead, immediately below the roof rafters. The latter system is used when the purpose is to dry rather than to warm the atmosphere, such as in carnation houses (Hellyer 1993, 414).

A plentiful supply of water was another necessity in maintaining an efficient kitchen garden. Water was sometimes carried in carts from a nearby loch or river, transported to the garden using a horse-drawn bowser or obtained from a water-tower, well or pump. Here, there is evidence for a water pump (see below), located

conveniently close to the row of glasshouses. In addition, rainwater could be collected from the guttering fitted to the glasshouse roofs by means of a downpipe and a water butt. Davies (1987, 17) notes that, in Victorian times, garden workers would have spent many hours walking up and down fruit houses spraying trees and floors with water using syringes, to maintain the correct humidity.

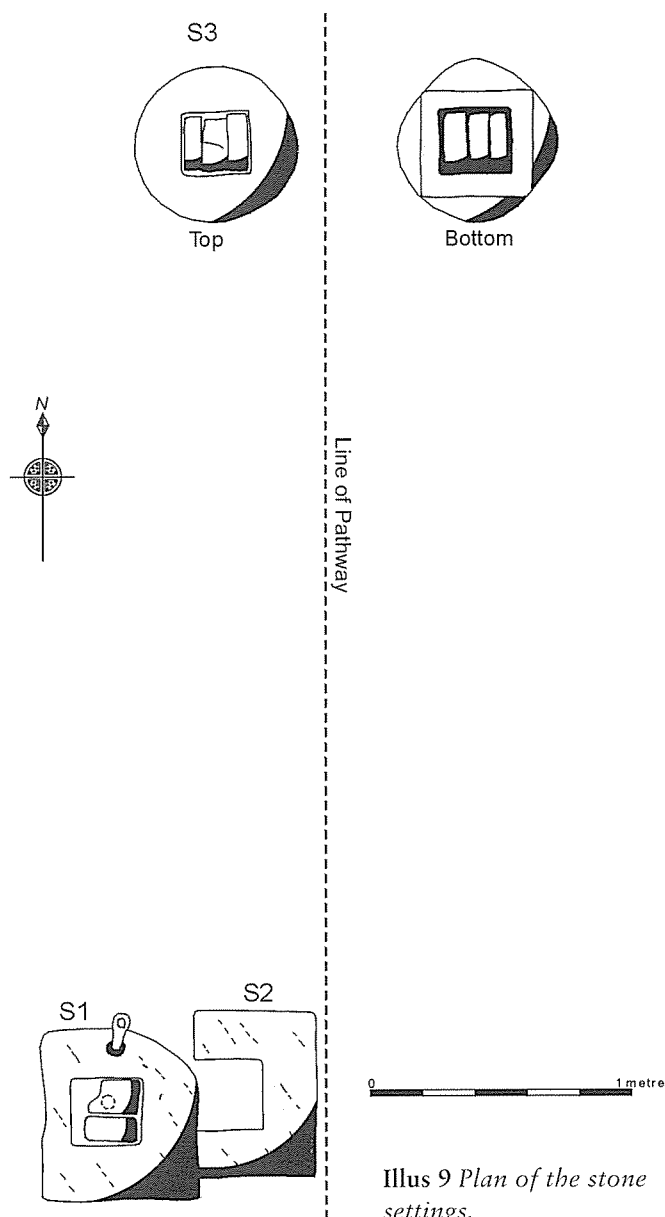
Kitchen gardens and their glasshouses were often sited close to the stables, as a constant supply of fresh manure was required to maintain soil fertility. Horse dung, together with tanner's bark, if available, was considered essential for the raising of melons, a prestige fruit during the 18th century. Among the other types of fertiliser used in kitchen gardens was bone dust, which, during the late 18th and 19th centuries, was considered to be the most favourable manure for turnips, asparagus and other culinary plants (Delamer 1855). Bones for the purpose often came from the house's kitchens, but, in the 19th century, were also imported from Germany and northern Europe.

Stone settings

Near the junction of the two pathways across the garden, on the eastern side of the north to south pathway, two stone settings were encountered, close to the modern ground surface (Illus 9). The southernmost of these, labelled S1, was roughly rectangular in plan but had one curved face. It concealed a copper water pipe within a central socket. This had been filled, and the pipe covered, by two bricks. The water pipe indicates that this setting may have formed the base of a water pump, which would have provided water for the garden. A second stone setting directly adjacent to S1 on its eastern side (labelled S2) served as an attendant soakaway. A conjectural reconstruction of the type of water pump envisaged is shown in Illus 10.

A third stone setting (labelled S3) was positioned 2.93m to the north of S1, on the northern side of the east to west path. This setting was circular in plan, with chamfered edges and, like S1, had a central socket which had been filled with bricks. This setting may have functioned as the base to a decorative feature such as a small statue or a sundial. During the archaeological evaluation work, a young passer-by commented that her grandfather recalled there having been at least one statue within the walled garden.

Owners of kitchen gardens often incorporated a range of decorative devices. These were widely fashionable in the formal gardens of the 17th century, particularly in Europe (eg Rémon 1949, 47–9). Larger kitchen gardens could contain aviaries, doocots, or pergolas. Topiary returned to Victorian gardens after a period of unpopularity, and statues, sundials, urns and ornamental fountains were used in various ways to enhance the aesthetic effects of kitchen gardens. During the 19th century, gardens of various kinds provided themes for poetry, and poets also celebrated the riches of nature, as John Keats does in his 'Ode to a Nightingale' in 1819.



Illus 9 Plan of the stone settings.

The construction of sundials flourished in Europe between the 16th and 18th centuries. Polygonal examples are present as finials on the northern piers of the west wall of Kinross House's formal gardens. The RCAHMS (1933, 301) records these examples as having been carved for John Hamilton in 1686.

Discussion and conclusions

The present owner of Kinross House, Sir David Montgomery, comments (1990, 5) that 'Sir William Bruce was an architect whose importance was greatly underestimated, but his house in Kinross has now an esteemed place in Scottish architectural history'. Bruce's pupils went on to design and reconstruct a number of other imposing dwellings in central Scotland. One of these was William Adam (1689–1743), whose work included the reconstruction of Lawers House and a mausoleum for the first Duke of Montrose at Aberuthven (Walker and McGregor 1999, 169). Sir



Illus 10 Conjectural reconstruction drawing of the type of water pump envisaged in the northern part of the garden.

William Bruce himself, along with his wife and son, is buried in a small mortuary chapel, the only surviving part of the original parish church of Kinross, in the town's cemetery (Duncan 1997, 177).

It would appear that the walled garden at Kinross House owes its position and layout partly to Bruce's grand design for the gardens and partly to Sir Basil Montgomery's remodelling of the grounds from 1902. Despite the recovery of a clay pipe bowl dating from the period in which the gardens were laid out by Bruce, the probable dating of the garden walls indicates that their construction was part of the remodelling of the grounds. The glasshouses also dated from this period. As mentioned above, no trace of a kitchen garden appears on the large-scale Ordnance Survey maps of 1854 and 1896. Neither garden walls nor the stone-built gazebos at the northern end of the garden are depicted. It must be concluded from this that the recent form of the garden originated in the early years of the 20th century.

The question arises as to what extent any pre-existing garden boundaries were incorporated into this garden. The boundaries of the walled garden, as shown on the Ordnance Survey map of 1915, are not exactly the same as those depicted on the late 17th-century plan attributed to Alexander Edward. On Edward's plan, the garden appears to extend further to the east. A low bank recently identified to the east of the garden may represent the eastern boundary of the late 17th-century kitchen garden. No traces of any earlier walls were

found, and it seems possible that this garden was not walled (see above), although it is possible that some of the stone incorporated in the modern garden's eastern wall was derived from an earlier structure. The soil deposits underlying the garden paths appeared to have been cultivated, indicating earlier activity.

It would appear from the cartographic evidence that the late 17th-century kitchen garden shown on Alexander Edward's plan had fallen out of use and perhaps largely disappeared by the time of the first Ordnance Survey map in 1854. This might be explained by the fact that Kinross House was unoccupied between 1819 and around 1881, hence no produce would have been required. Sir Basil Montgomery clearly thought it worth the investment to re-establish a kitchen garden on the site in 1902 or shortly thereafter.

The two-day archaeological evaluation revealed the division of the garden by paths and the stone settings, all of which were obscured by topsoil, but the intrusive archaeology yielded little information about the early development of the garden. Detailed archaeological recording, documentary and cartographic research has shed more light on this. Archaeology has been used successfully in a growing number of locations, to clarify the meaning of historical plans and to reveal the layout of formal gardens. In Williamsburg, Virginia and Monticello, near Charlottesville, for example, archaeological detection of 18th-century paths, gateways and planting beds has revealed much about plantation estates that were widely neglected during the 19th century (Kelso 1984, 159–60).

Historic gardens reflect the complex interplay between social aspirations, artistic aims, changing fashions, wealth and status (Taylor 1983, 41). The management of walled kitchen gardens like this one at Kinross reflected many Victorian ideals, such as the quest for improvement, continual inventiveness, and the maintenance of a strict social hierarchy. Many of the skills required in the kitchen garden, such as successional sowing, fruit cultivation and forcing vegetables, had been handed down for generations. Good head gardeners were keenly sought, and their standing was probably on a par with that of the most senior house servant, the butler (Davies 1987, 11). The surviving evidence here of large, well-maintained glasshouses reflects a period when gardens such as this employed a busy, skilled workforce and produced a wide range of high quality produce. As Susan Campbell (1998b, 112) notes, by the end of the Edwardian era there was virtually no fruit, flower or vegetable that could not be grown in Britain, in glasshouses or frames.

The archaeological and oral record of statues and possibly other decorative elements in this walled garden is a reminder that kitchen gardens were attractive to their owners and to visitors alike. All gardens can be seen as attempts to order the natural world to provide their creators with aesthetic or material satisfaction, and although in kitchen gardens the aesthetic importance was secondary to that of their material produce, the two aims were clearly merged, particularly in the

grounds of the grandest households. Decorative features within enclosed gardens have been popular since the medieval period, when aesthetic spaces were created within already enclosed gardens by semi-circular arbours, constructed from coppiced poles and covered with vines, honeysuckle or roses (Jay 1998, 77). As well as taking up little lateral space, trained fruit trees, evidence for which survives here, are decorative in outline and attractive when in bloom or carrying fruit. Just as visitors to formal and romantic landscape gardens became immersed in the spirit of the places, so, too, could visitors to the walled kitchen gardens of the past have responded to the poetic and decorative stimuli within their walls.

The surviving evidence of the development of the garden at Kinross, in terms of standing structures, buried remains and local tradition, is fragmentary in contrast with the documented importance of kitchen gardens in general. This garden, lying within the otherwise well-preserved and carefully maintained grounds of Sir William Bruce's own house, offers a reminder of how the impact of economic changes during over the past 100 years has led to the abandonment and neglect of places that were often at the peak of their productivity until the outbreak of the Second World War. The huge investment in the fabric of walled kitchen gardens, along with the efforts of their large and skilled workforces, resulted in produce of a quality that, it could be argued, is seldom approached today.

Rising labour costs and the increasing ease of transporting organic produce have precipitated a sharp decline in home vegetable production, and with it the demise of many kitchen gardens. Contemporary processes such as infill housing development and adaptation of the land to a range of other uses (as here) are causing other examples to be lost. Also as here, living memory of this type of garden is beginning to fade, except in special cases where agencies such as Historic Scotland and the National Trust for Scotland ensure their preservation. This serves to demonstrate the value of recording what remains of this once flourishing economic activity, before the evidence is finally lost.

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References

- Campbell, S 1996 *Charleston Kidding: A history of kitchen gardening*. London.
- Campbell, S 1998a 'Digging, sowing and cropping in the open ground, 1600–1900' in Wilson, C A (ed) *The country house kitchen garden 1600–1950*, 9–35. Stroud, Gloucestershire.
- Campbell, S 1998b 'Glasshouses and frames, 1600–1900', in Wilson, C A (ed) *The country house kitchen garden 1600–1950*, 100–113. Stroud, Gloucestershire.
- Davies, J 1987 *The Victorian kitchen garden*. London.
- Defoe, D 1726 *Tour thro' the whole island of Great Britain* (Vol 3: Account and description of Scotland). London.
- Delamer, E S 1855 *The kitchen garden or the culture in open ground of roots, vegetables, herbs and fruits*. London.
- Douglas, G and Oglethorpe, N 1993 *Brick, tile and fireclay industries in Scotland*. Edinburgh.
- Duncan, J 1997 *Perth and Kinross—the big county*. Edinburgh.
- Gallagher, D B and Harrison, J 1995 'Tobacco pipemakers in 17th-century Stirling', *Proc Soc Antiq Scot* 125 (1995), 1131–42.
- Hallen, A C W 1894 *Account book of Sir John Foulis of Ravelston 1671–1707*. Edinburgh.
- Hay, R (ed) 1980 *New illustrated guide to gardening*. London.
- Hellyer, A G L 1993 *Gardening encyclopaedia* (revised and updated by R Rosenfeld). London.
- Hitt, T 1757 *A treatise of fruit-trees*. London.
- Hynd, N R 1984 'Towards a study of gardening in Scotland from the sixteenth to the eighteenth centuries' *Studies in Scottish Antiquity*, 6.
- Jamieson, F 1993 *Kinross House and Garden* The Garden History Society, Scottish Group.
- Jay, R 1998 *Gardens of the spirit*. Alresford, Hampshire.
- Kelso, W M 1984 'Landscape archaeology: a key to Virginia's cultivated past' in Maccubbin, R P and Martin, P (eds) *British and American gardens in the eighteenth century*. Williamsburg, Virginia.
- Lawson, W 1618 *The countryside housewife's garden*.
- Mackenzie and Moncur Limited 1907 *Catalogue of horticultural buildings, general estate buildings, pavilions, etc, etc*. Edinburgh.
- McIntosh, C 1852 *The new and improved practical gardener, and modern horticulturalist*. London.
- McIntosh, C 1853 *The book of the garden*.
- Montgomery, D 1990 'Foreword' in Walker, N H *Kinross House and its associations*, 5 (published privately).
- Pople, David 1992 *The kitchen gardener*. London.
- Rémon, G 1949 *Les jardins de l'antiquité à nos jours*. Paris.
- Robertson, F W 2000 *Early Scottish gardeners and their plants, 1650–1750*. East Linton.
- Robertson, U A 1998 'The country house kitchen garden in Scotland, 1600–1900' in Wilson, C A 1998 *The country house kitchen garden 1600–1950*, 129–43. Stroud, Gloucestershire.
- Rogers, W S 1902 *Villa gardens*. London.
- RCAHMS (Royal Commission on Ancient and Historical Monuments and Constructions of Scotland) 1933 *11th report with inventory of monuments and constructions in the counties of Fife, Kinross and Clackmannan*.
- Sinclair, Sir John (ed) *Statistical account of Scotland* 21 vols, 1791–9. Edinburgh.
- Taylor, C 1983 *The archaeology of gardens*. Aylesbury.
- Thompson, R 1878 *The gardener's assistant: practical and scientific*. London.
- Thomson, G 1980 *The butterflies of Scotland: a natural history*. London.
- Walker, B and Ritchie, G 1987 *Exploring Scotland's Heritage: Fife and Tayside*. Edinburgh.
- Walker, B and McGregor, C 1999 'Castles and mansion houses' in Omand, D (ed) *The Perthshire book*, 165–76. Edinburgh.
- Walker, N H 1990 *Kinross House and its associations* (published privately).
- Walls, I G 1983 *The complete book of the greenhouse* third edition. London.
- Warner, C Dudley 1876 *My summer in a garden*. London.

Cartographic sources

- Ainslie, J 1775 County of Fife.
- Bell, J 1796 County of Kinross.
- Roy's military map of Perthshire and Kinross-shire, c1747–55.
- Sharp, T, Greenwood, C and Fowler, W 1828 Map of the counties of Fife and Kinross.
- Ordnance Survey 1854 Fife and Kinross, Sheet 22, Six inches to one mile.
- Ordnance Survey 1896 Kinross-shire, Sheet XXVI.2, First edition, 1:2500.
- Ordnance Survey 1915 Kinross-shire, Sheet XXVI.2, 1:2500.

Abstract

An archaeological evaluation in 1994 of a derelict walled garden in the grounds of Kinross House revealed the nature and survival of several internal features, including a summerhouse, glasshouses, paths and stone settings. Subsequent archaeological recording, documentary and cartographic research has shed further light on its history and development.

Keywords

glasshouses
Kinross
kitchen gardening

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