

The Nineteenth-Century, Curvilinear Lean-to Glasshouse Range at Felton Park, Felton, Northumberland.

An evaluation of the local context, possible date and manufacturer, and rarity of the structure for Historic England – a revision of the 2013 report reflecting further research and investigation during the 2015 repairs.



The glasshouse range undergoing repairs. Looking NE. September 2015

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Summary

This document reviews the 2013 evaluation report on the Felton Park glasshouse and incorporates findings resulting from the detailed inspection of elements of the building made possible by the extensive repairs undertaken during 2015. The 2013 evaluation confirmed what a remarkable, rare and important survival the glasshouse is, not only in the North-East but in the country as a whole. The 2015 review threw further light on the development of the associated potting shed and answered some of the questions about the glasshouse, such as the variation between the iron components, subsequent modifications to the internal supports and the wall head arrangements. A number of significant questions remain to be answered and there is considerable potential for further archaeological investigation of the building and comparative examples elsewhere.

The repair works - made possible with funding from Historic England, the Heritage Lottery Fund, the Country Houses Foundation and Northumberland County Council, together with the commitment and perseverance of the owner, architect and specialist contractor - have safeguarded the building for the future.

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Introduction

The nineteenth-century curvilinear metallic glasshouse range and associated potting shed are built lean-to against the eighteenth-century garden wall at Felton Park. The estate lies on the outskirts of Felton village, on the old Great North Road between Alnwick and Morpeth in Northumberland.

The significance of the building as an unusual survivor of its type has been recognised by its designation as a Grade II* Listed Building and concern over its long term future has been registered by its inclusion on the regional Heritage at Risk register since the late 1990s.

The regional Heritage at Risk team of English Heritage (now Historic England), based in Newcastle, commissioned the 2013 evaluation to build on the already substantial body of recording and investigation undertaken by the architects, Spence and Dower, and to test the significance of the building in its local, regional and national context. This was to help to justify the substantial funding required to conserve the building for the future.

Particular areas of enquiry were to establish just how rare the building is, both in the region and nationwide; and to describe the local context of the building.

Research was undertaken using primary documents (principally maps and plans and old newspapers) and secondary sources, both web based and published (contemporary and modern accounts); and an illustrated summary of the building was circulated to the Walled Kitchen Gardens Network, via the Association of Garden Trusts to the various County Gardens Trust's and the Garden History Society to establish, through members' knowledge, what other examples of the type of building have survived.

The 2015 repairs provided an opportunity to revisit the site and discuss new findings resulting from the repairs and review the unanswered questions raised in the original study with Robin Dower, the architect in charge of the repair programme. A study day at Felton in late September 2015 provided an opportunity to learn more about the building and its contemporaries from other speakers.

Acknowledgements

Thanks are due to Tim Maxwell, the owner of the site, for his interest and enthusiasm throughout the project, and for sharing his own researches on Felton. David Farrington and Susie Barson of Historic England commissioned the original 2013 investigation report and the 2015 review. Susie deserves particular thanks for her patience and perseverance in editing the review. Robin Dower, who has been the conservation architect involved with the Felton project from the beginning, shared his knowledge of the buildings and their conservation.

The project website [<http://feltonparkgreenhouse.org/>] provides much additional information and contributions from the craftsmen who worked on the conservation of the building.



Project Architect Robin Dower speaking to members of the public attending the September 2015 Study Day at Felton

1. The glasshouse in its local context - Felton Hall and Felton Park, Felton, Northumberland.

1.1 The eighteenth century

Felton Hall is an eighteenth-century country house, built for Edward Horsley Widdrington in 1732, which passed by the marriage of his daughter to Thomas Riddell, and was remodelled in 1799 for Ralph Riddell. The main part of the house was demolished in 1951.

It is described by John Wallis, in his Natural History...of Northumberland , published in 1769:

“At the western end of the village [of Felton], is a handsome modern structure, called, Felton Hall, the occasional residence of Mr. Ridell, built by Mr. Widdrington; the gardens to the east; the river Coquet taking its course between two hanging banks of wood at a small distance to the south.”

The 1777 Estate Plan surveyed by Thomas Bell [NRO ref. No. 225/1] confirms the arrangement of the gardens to the east of the house, showing a series of rectilinear enclosures extending southwards into the Hall Field for just over twice the depth of the house and the service ranges. The northern boundary is the approach drive or lane to the house from Felton village and the current garden wall may date from this period (a 1774 scratch date on a brick in the south face

over the western door in the north wall would seem to confirm this), providing the all-important shelter from the north and a good length of south facing wall for the production of fruit from trees trained on the south side of the wall. No buildings are shown in the garden on this plan.

The grassland of the Hall Field is shown sweeping right up to the house in the then fashionable Brownian manner.

Hutchinson, in A View of Northumberland, 1778, confirms (p. 279) that *“Mr Riddell has a seat-house at the west end of the village”*.

The closing decade of the eighteenth century saw an improved approach to the house from Felton. A stone bridge, with ornamental ironwork, led past a new lodge [the list description gives a date for the building as: c.1800] and gave access to a more gently graded drive.



The lodge, on the approach from Felton village, in 2013.

1.2 The early nineteenth century

The wider availability of published sources for the nineteenth century throws more light on the horticultural activities at Felton. The gardeners were achieving success at horticultural shows both locally and further afield.

The 1823 list of Officers and Members of the Horticultural Society of London records:

Robson, Mr Mark, Gardener to Ralph Riddell, Esq. at Felton Hall, near Morpeth, Northumberland.

The List of Persons to whom the Banksian Medal has been presented by Order of the Council of the Horticultural Society of London, for Exhibitions at General Meetings of the Society, from May 1, 1823 to May 1, 1824. records an award to:

Mr Mark Robson, C.M.H.S., Gardener to Ralph Riddell, Esq. F.H.S. at Felton Hall, Northumberland, for Grapes, exhibited August 19, 1823.

In 1827 Parson and White's *History, Directory and Gazetteer of the Counties of Durham and Northumberland* [Vol.II, pp. 469-470] describes Felton as Ralph Riddell's principal residence – "a commodious mansion, delightfully situated on a fine regular eminence, in a spacious park..."

In the same year, at a meeting of the Botanical and Horticultural Society for Durham, Northumberland and Newcastle-upon-Tyne; held at the Queen's Head Inn in Newcastle; the society's Gold Medal was awarded to Mr James Lowry, gardener to Ralph Riddell Esq. , Felton Park, for the best Pine Apple. [*Newcastle Courant*. Sat 14 July 1827]. Tim Maxwell recalls a conversation with a former owner at Felton who described the foundations of the pine stove surviving until Bothy Lodge was built. The pine stove augmented the initial hot wall provision to allow specialist crops to be successfully grown. The old apple store is the only surviving garden building at the SE corner of the former garden area.

It was a good season for Mr Lowry, as in September he won the silver medal for best Pine Apple at the Society's meeting at the White Swan Inn in Alnwick. [*Newcastle Courant*. Sat 22 Sept 1827].

The cultivation and fruiting of pineapples required glass and heat (and great skill) and was recognised as a great accomplishment.

In 1829, at the Branch General Meeting of the Society, held in Alnwick on July 10, the silver medal for the best dish of cherries was awarded to Mr Lowrey, gardener to Ralph Riddell Esq., Felton Park. [*Newcastle Courant*, July 18 1829].



Extract from engraving, c.1828, titled Felton Park, the Seat of Ralph Riddell Esq. from the south east

An advertisement for a series of Views in Northumberland in *The Northumberland Poll Book*, published in 1828 by W. Davison of Alnwick; lists:

16. Felton Park, the Seat of Ralph Riddell Esq. from the south east.

This view is useful as it confirms the layout shown of the 1777 plan with the parkland sweeping up to the house and shows the north wall of the garden with wall trained fruit trees and a smoking chimney, indicating a working heated wall!



A number of paired openings can be seen on the north side of the garden wall, indicating removable brickwork to allow access for cleaning the flues of the hot wall



Extract from Greenwood and Co.'s Map of Northumberland, published 1828, showing the extent of the parkland; the rectilinear form of the old garden and the drive approaching from Felton village and the Great North Road to the east.

Greenwood's County map of 1828, although small scale, appears to show the rectangular garden, shown on the 1777 estate plan, apparently still in place. A clear area between the garden enclosure and the parkland suggests the development of a pleasure ground walk but as it is open to the road to the north it may simply be a pragmatic access to the garden – particularly to the frame yard in the SE corner (see later Ordnance Survey mapping). The scale is too small to show clearly if the curvilinear greenhouse range existed by this date but it is unlikely.

An obituary for Ralph Riddell of Felton Park in *The Gentleman's Magazine* [Vol.103 Part 1 p.468] for 1833 records that: "He was passionately fond of rearing and training race-horses, and eminently successful on the turf; yet he was no gambler, but of very steady and retired habits..."

His successor Thomas Riddell played a full part in local and County activities. He was elected High Sheriff for Northumberland in 1836.

An auction notice of 1839 announces the sale of the household furniture of Mr Lowrey of Felton Hall Garden House. [Northumberland Records Office: ZMD 167/18/76 14 April 1839]. James Lowrey had been the gardener since the 1820s.



Garden House in 2013

Mr Lowrey's successor, John Crossling, was similarly successful at the show bench. In the 1840s he was a regular contributor to local shows of the Felton Union of Florists and Horticulturalists, held at the various public houses in the village [The Gardeners Chronicle, Vol. 3, 1843, p.484 records a meeting at The Widdrington Arms where Mr Crossling, Felton Park, was awarded an extra prize

for *two very superior stands of Pansies and a splendid Pelargonium, called Sylph*; and further afield at shows of the Morpeth Floral and Horticultural Society and at Hexham. Varieties entered included Pansies (including the varieties, presumably named at Felton, Crossling's Victor and Crossling's Golden Gauge); Pinks; Rose Tulips and Hybrid and China Roses.

He is described in several show reports of the 1840s as gardener to George Burdon Esq., Felton Park. Presumably the estate was leased for a period. The *Carlisle Journal* of 14 May 1842 records the sad news of the death of Augusta the 3rd daughter of George Burdon of Felton Park.

The British Florist: Or, Lady's Journal of Horticulture...for 1846 records (p.83) the award of a third prize for Polyanthus *Black and Gold* to Mr. Crossling, gardener to George Burdon, Esq., Felton Park.

A report of the May show of the Felton Union of Florists and Horticulturalists at 'Mrs Hines', in the Midland Florist and Suburban Horticulturalist...of 1851, records prizes awarded to J. Crossling for Auriculas - *Warris's Union* [First] and *Lancashire Hero* [Third] and 'the prize for the best seedling polyanthus was awarded to Mr. Crossling, for a very promising sort, named Lady Crewe, which was evidently a seedling from Lord Crewe'.

At the June show J. Crossling wins second prize for Tulip *Old Catafalque* in the Feathered Bizarres category; Fifth for *Grand Marvel* in the Feathered Byblyoemens; First for *Incomparable* in the Flamed Byblyoemens; and Fifth for *Cerise Triumphant* in the Flamed Roses.

In the July show J. Crossling takes a Fifth prize for the Variegated Ranunculus *Quentin Durward* and under Pansies:

The 1st Prize for the best stand of six dissimilar blooms was awarded to Mr. J. Crossling, gardener, Felton Park, for Crossling's Golden Gauge, Zabdi, Dutchess of Rutland, Riddell's Conqueror, Crossling's Sylph and Crossling's Gem of Northumberland.

He also wins the 2nd prize in the same class with:

Lightbody's Lord Jeffry, Conqueror, Golden Gauge, Crossling's Mulberry, Exquisite, Zabdi, and Crossling's Mrs Crossling.

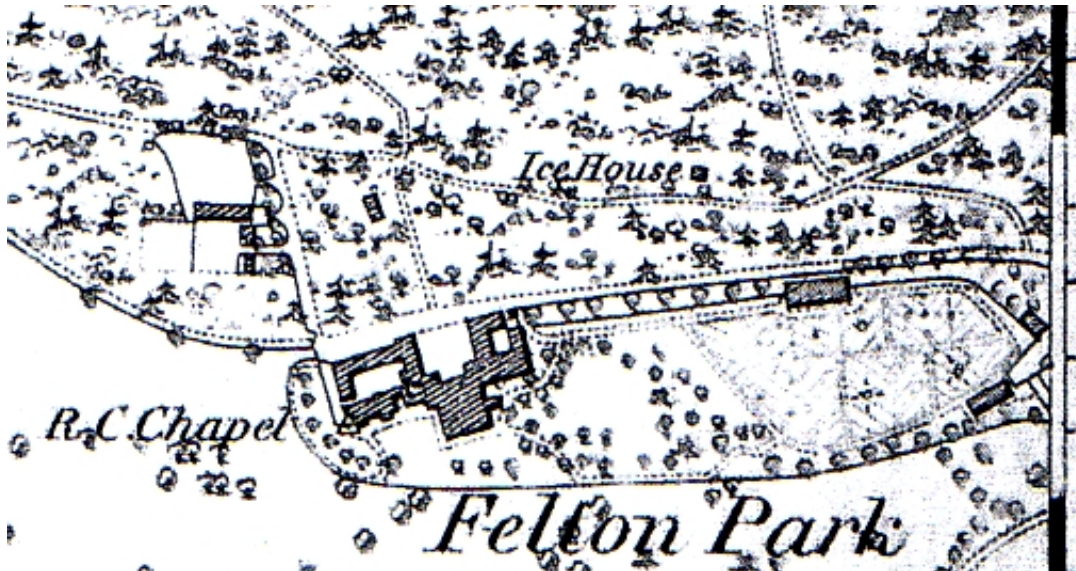
The entry records that:

The prize for the best seedling pansy was awarded to Mr. Crossling, for a very beautiful seedling, something after the fashion of Rainbow, but with a most splendid light sky blue centre – a lovely gem indeed, which was named Crossling's Mrs Crossling.

The latest newspaper entry to associate Crossling with George Burdon at Felton seems to be in 1852 after which the estate may have been taken back in hand.

1.3 Mid-century improvements

The building of the private chapel (completed 1857) to the west of the house for Thomas Riddell may have been the catalyst for a reorganization of the pleasure ground which was extended westwards to encompass the new building and in doing so provided a lawned area between the house and the park proper. Remnants of iron park fencing remain along this boundary, providing a rabbit proof barrier for the pleasure ground. The First Edition of the Ordnance Survey, surveyed in 1864, reflects this arrangement, showing established trees and shrubs in the lawned area. The productive garden appears to have been pushed eastwards and given a more naturalistic boundary with the pleasure ground, with no apparent division other than a perimeter walk. The greenhouse, mapped for the first time, is the principal feature in the productive garden with the principal north/south walk aligned on the centre of the eastern part (thought to be the earlier) of the structure. The other productive glass is grouped in a frame yard at the SE corner of the productive garden, though one other glasshouse is accessible from the perimeter walk.



Extract from O.S. 1st Edition 1:10560 map [Northumberland Sheet XLV] , surveyed in 1864, showing the vinery range and potting shed on the north wall. The north wall has been extended eastwards by this date and the pleasure ground now separates garden and house from the park.

The *Hexham Courant* [24 August 1864] records "...a gala day at Felton, the occasion being the holding of the annual shows of the Agricultural and Floral societies, both of which were held in the beautiful grounds of Thos. Riddell, Esq. , Felton Park."

Thomas Riddell died in 1870. Following his death Swinburne Castle became the favoured Riddell residence and the house at Felton was once more tenanted, suggesting a period of limited investment in alternations and improvements.

An article in the Newcastle Courant for Friday 28 July 1876, describing (p.2) the visit of the Duke of Connaught to Northumberland, records that Felton village street was adorned with flags and flowers and the bridge was decorated `under the superintendence of Mr Crossling`.

Tomlinson [*Guide to Northumberland*, 1888] records (p.370) that Felton Park was the seat of Hugh Andrews Esq.

Andrews, a colliery owner and member of the North of England Institute of Mining and Mechanical Engineers, moved from Eastfield Hall, Bilton, Northumberland, to Felton Park in 1877, which remained his residence until at least 1881 (and, if Tomlinson's information was up to date, 1888). By 1889 he has moved to Swarland Hall, Felton. [Durham Mining Museum website]. He also had coal shipping interests and was much involved in the development of Warkworth Harbour (Amble) for coal shipping.

Tomlinson describes the house as being: *situated on gently rising ground in the park, amid very beautiful and extensive grounds*. The garden: *contains a fine collection of plants from Japan, remarkable for the peculiar and striking beauty of the leaves*.



Extract from O.S. 2nd Edition 1:10560 map, revised 1896. The layout of pleasure grounds and productive garden remain largely unaltered.

1.4 The twentieth century

An Edwardian postcard view [c.1903] of the south and east fronts of the house and the chapel beyond, taken from the park, shows the park railings bounding the pleasure ground largely free of planting. Within the pleasure ground large

well established shrubs are evident, as is a young Monkey Puzzle to the south of the house. A pair of large ornamental urns flank the walk sweeping back towards the house. [Beamish photo collection. Photo No. 74447].

Volume 7 of A History of Northumberland (1904) records (pp. 265/266) that Felton Park “is planted with well grown forest and ornamental trees which protect a house erected in 1732 for Edward Horsley Widdrington...” it also notes that “In a fine eighteenth-century walled garden adjoining there is an extensive collection of old fashioned herbaceous plants.”. Mr. Cuthbert Riddell (son of Mr. J.G. Riddell of Felton Park) is recorded as the owner.

The Garden Annual, Almanack and Address Book for 1909, Edited by W. Robinson and published by Gardening Illustrated, lists amongst the *Principal Gardens...* in Northumberland (p.179):

Felton Park. W.H. Forster, Esq., Acklington.

In 1910 Kelly's *Directory* records that Felton Park is the property of Cuthbert David Giffard Riddell, J.P., of Swinburne Castle. At this date it was the residence of Mrs Forster. The mansion is described as being “of considerable extent, delightfully seated on gently rising ground, in a park of about 550 acres...”.



Extract from the O.S. 1:2500 plan, 3rd Edition of 1923, revised 1921 [Northumberland [New Series] Sheet 51.1]. The pleasure ground, productive garden and frame yard are still intact.

The miniature rifle club (now in the eastern part of the walled garden) dates back to at least 1912. [Sat 12 Oct 1912 *Alnwick Mercury*]. Clubs of this sort were encouraged following the Boer War to improve the national marksmanship!

The Annual Felton Flower show continued to be held in the grounds of Felton Park. [Sat 12 Oct 1912 *Alnwick Mercury*].

The impact of the First World War on the availability of labour to maintain both house and gardens and the wider agricultural estate saw many estates such as Felton Park starting to become less viable and the economic uncertainties and increased taxation burden of the post-War decades made tenancies less attractive.

In both 1934 and 1938 Kelly's *Directory* for Northumberland records, in the List of the Principal Seats in Northumberland: *Felton Park, Felton (unoccupied)*.

The house and park was requisitioned for the army during the 1939-45 war and suffered consequently as huts and roadways were built in the park and grounds. The vehicle width gate in the north wall giving access into the garden area presumably dates from this time – a concrete apron dating from this period has only been removed relatively recently and geophysical survey suggests that a lot of material was spread over the adjacent area, presumably to enable vehicles to park on the relatively soft garden ground!

In recent decades the estate has experienced gradual fragmentation of ownership and a number of changes as houses have been built towards the village end of the garden - on the site of the old sawmill adjoining the eastern section of the garden wall and the former site of the greenhouses and frame yard at the SE corner of the garden. A small bore rifle range occupies an area of the eastern side of the former garden.

2. Who built the Felton Glasshouse and potting shed range – and when?

The glasshouse range first appears on a map in 1864 but comparison with other dated examples of this type of building would suggest that it was built earlier in the century. Unfortunately no earlier surviving documents have been identified which might help with a date of construction. The structure itself and the way it has been assembled, when compared with others of the period, seems to be the best indication of who built the glasshouse and when.

The manufacturer and the builder of the lean-to curvilinear range at Felton are unknown. Apart from finding a definitive match for the unusual longitudinal form of the glazing bars or other components such as the top hung front sashes with their distinctive rebates or the movable ladder - which has not proved possible to date – the only potential clue to its region of manufacture seems to be the lock boxes on the two surviving iron doors.



J.Young maker's plate on one of the lock boxes at Felton

The locksmith John Young, of Wolverhampton, obtained a patent for "improvements on locks and latches..." including the pendulum latch, in July 1831. [*The Register of arts, and journal of patent inventions*, ed. Luke Herbert 1832. pp.7,8].

Online searching in 2015 produced another example of the lock in an American museum (the Winterther Museum), though the details given did not state if the lock had come from a glasshouse door. One of the Felton locks was removed and sent for repair to allow reuse, leaving one original undisturbed as part of the 2015 repairs. Removal of the lock box showed that the original moulding on the door had been cut away to accommodate the lock and was not part of the original design.



Partition lock box removed during repairs 2015. N.B. the moulding on the cast iron door plate was cut away to accommodate the lock, indicating that the lock was not part of the original design

It may be stretching a slender connection too far but it seems reasonable to look about that part of the country for a manufacturer of the doors to which the locks were added.

Jeremy Milln kindly passed on his Statement of Significance for the curvilinear lean-to vinery range at Millichope Park, Shropshire, which identifies possible manufacturers of curvilinear glasshouses in the West Midlands in this period and allowed a search of contemporary publications.

J.C. Loudon, in a section of his publication *The Gardener's Magazine and Register of Rural & Domestic Improvement*. Vol.2 ,1827 p.108. titled *Calls at Suburban Gardens*, describing a visit to Syon [an estate of the Duke of Northumberland], advocates three manufacturers of metallic hot houses. They are Messrs.Bailey of London; Messrs. Richards & Jones of Cheapside , Birmingham and Messrs. Jones and Clarke of Birmingham. The three manufacturers (together with the input of skilled head gardeners) are credited with bringing "the construction of this description of metallic hot-houses to so much perfection, [and] deserve the thanks of all horticulturists."

In the same article Loudon describes the work of Richards and Jones at Syon, where a "magnificent range" of hot houses exceeding 400 feet in length had been constructed "entirely of metal, even to the wall-plates, the doors, and the framing of the sashes."

Richards and Jones were "now engaged in erecting a most extensive range of the same kind at Alnwick Castle". Given the proximity of Felton to Alnwick it is tempting to speculate that where the Duke led the Riddells were soon to follow! James Wright Richards, `metallic hot house manufacturer` of Caroline Street, Birmingham, patented an `Improved metallic frame for hot houses` in 1824 [The London journal of arts and sciences... 1825, p.235 Recent Patents]. In 2015 research on the Alnwick walled garden produced further information on the development of the glasshouses (see Alnwick entry in Appendix, below).

An advertisement for curvilinear metallic hot-houses by Jones and Clarke of the Metallic Hot-house Manufactory, 55 Lionel Street, Birmingham appears in the same publication (p. 382).

In *The Gardener's Magazine and Register of Rural & Domestic Improvement* for 1829, Loudon, in a review of M'Intosh's *Practical Gardener* (p.180 ff.), revisits the ongoing debate about durability of iron glasshouses and notes that "Bailey, Bramah, Richards, Jones and Cottam generally contract to keep their erections in repair for 14 years..." adding two more names to the recognised manufacturers list (and additional research in 2015 suggested a further contender in Northampton - see the Swiss Garden entry under Bedfordshire in the Appendix, below).

By 1830 *The history, topography and directory of Warwickshire* by William West records three metallic hot house manufacturers in the County. They are Richards and Jones in Cheapside (p.256); Mr Jones (formerly senior partner in the firm of Jones & Clark in Lionel Street) but now in Mount Street (p.275) and Thomas Clarke – Hot house and horticultural building constructor, metallic and copper sash &c. manufacturer at 55 Lionel Street.

In the Birmingham directory (p. 379) Richards and Jones are described as: Hot house and horticultural building constructors and metallic and copper sash, &c. manufacturers.

An advertisement in J.C. Loudon's *Suburban Gardener...* of 1838, for Clark's Metallic Hot-House and Copper Sash Manufactory, 55, Lionel Street, Birmingham indicates that by that date the firm has clearly undertaken several prestigious commissions:

Thomas Clark, in soliciting a continuance of the liberal patronage with which he has been honoured during a period of nearly twenty years, begs to invite the attention of the Nobility and Gentry to the extensive ranges of HORTICULTURAL BUILDINGS in the Botanic Gardens of Manchester and Birmingham.

T. Clark also begs to announce that Mr John Jones, under who's superintendence the above buildings were erected, has since been engaged to conduct the manufacturing department in T.C.'s extensive establishment.

Since 2013 the online information accompanying the successful restoration of the ironwork of the transept of the grotto at The Swiss Garden, Old Warden in Bedfordshire, made between 1830 and 1833, suggested another manufacturer, the Eagle Foundry, Northampton. Further online searching for work by the company produced an article in *The Floriculture Magazine and Miscellany of Gardening* [Volumes 5-6, 1841) describing their work at Ashridge Park in Hertfordshire. The article [Observations on glazing Hothouses, Pits, &c. by Mr J. Seymour, Kitchen Gardener to the Countess of Bridgewater, Askridge [sic] Park, Great Berkhamstead, Herts. pp.156-7] describes how:

In the spring of 1838, we had occasion to rebuild two old metallic vineries, which was done by Messrs Barwell and Co., of the Eagle Foundry, Northampton.

The article describes the glazing of the vineries in detail. They were not curvilinear structures but the description of the front sashes sounds very similar to Felton and provides the only other description of the curious cut outs for the vine rods found in the front sashes at Felton:

The front sashes are hung with hinges, and open outwards, the extent of which is regulated by means of iron rods, placed with holes attached to the sashes, and by which they are fastened by iron pins, fixed in the front plate [at Felton in the stonework behind]: one corner of each sash is taken off, for the purpose of taking the vines in or out when necessary, and there is a piece of cast iron made to fit

these corners, fastened by screw nuts, to keep the stems of the vines in their places.



Restored casement from eastern division showing stay to control degree of opening (locating pin on sill behind) and rebate for vine stem to pass into the house from an external vine border

The Eagle foundry remains a tantalising possibility as a maker but unless records can be found or other similar dated examples identified to narrow a suggested date range between the early 1830s and the late 1840s, a more conclusive date and maker for the Felton glasshouse remains for the moment unknown.

2.1 The Glass

The narrow glazing bar spacing used at Felton is assumed to indicate a relatively early date for glasshouses, when the available glass making technology could only readily produce smaller panes and when, before the repeal of the Glass Tax in 1845, large panes of glass were relatively expensive. The use of small panes also allowed the glass to accommodate the steep curve of the front part of the glazing bar profile.

The design of the Felton glasshouse range would therefore suggest a construction date before the development of glass technology and the repeal of the tax in the mid 1840s encouraged designs incorporating larger panes of glass.

The EH Research Report on the glass [RR Series NO. 5 2013] indicates very little (one conclusive sample) survival of glass from the type produced in the date range 1830-70. This suggests that if the original construction date is before the mid 1840s the original glazing was largely replaced. It is possible that when the extension westwards was added to the original range a re-glazing was undertaken. The rolled glass used at Felton, which must have been produced after 1847 (date of the patent), may have been adopted to reduce scorch by diffusing the light entering the glasshouse.



Glazing restoration on the eastern part of the range. The temporary numbering was a means of replacing panes accurately. Sept 2015

2.1.1 The internal partition

Robin Dower observed that the internal partition is glazed from the west side suggesting that it was external to the first range and may contain the earliest surviving glass.

2.2.2 The potting shed

The potting shed glass (which contains some crown glass bullions) was not sampled. It may be worth considering a further look at this as it may be early and give a further clue to the original build.

The potting shed windows, which have “Yorkshire” horizontal sliding sashes, are not the original configuration, the window openings having been raised by some three brick courses at some point in the life of the range. The bricks are deeper than the original bricks in the potting shed wall indicating a substantial later modification to the original range. Both gables hint at modification and it may be that an existing shed range, pitched to the old garden wall head, was lifted to fit the elevated wall when the curvilinear range was built.



The west end gable brickwork suggests a rebuild of the upper courses, perhaps to accommodate the lifted roof of the potting shed



Potting shed window in the western part of the range with Crown glass bullions in the Yorkshire sashes. Note the additional three courses of deeper bricks below the window and at the wall head indicating modification of the opening.

Robin Dower observed that in 2002 they took down the section of flued hot-wall between the glasshouse and the wide gate into the garden to the west because it was leaning and on the point of collapse. The dismantling showed that the west gable of the potting shed was built against the leaning wall but that to make a satisfactory vertical face for the Glasshouse to abut and to support the higher parapet the wall appears to have been rebuilt properly plumbed up. The new wall that was rebuilt was also plumb so the planes of the two re-buildings more or less converged. At the other end (East) there doesn't appear to have been any misalignment and the buildings do look as though they were set up against the undisturbed brickwork of the original garden wall.



The garden wall to the west of the glasshouse was heated by internal flues, seen in section when the wall was dismantled for repair in 2002. The offset to accommodate the glasshouse can be seen at the wall head. [Photo. Robin Dower]



Detail at the wall head showing the western potting shed gable apparently built against the earlier garden wall rather than bonded with it, but oversailing the earlier wall towards the wall head. The flue appears to terminate in a chimney at the wall head. [Photo. Robin Dower, 2002]

2.2 What is unusual about the Felton glasshouse?

Unusual elements include the longitudinal form of the glazing bars - the nearest parallels illustrated being in Ireland, the work of Richard Turner of Dublin, in the lower section of the Palm House at Belfast Botanic Gardens (though even this seems flatter in profile) and the conservatory at Longville House, Mallow, Co. Cork (a late example of Turner's work); the rebates cast into the front sashes to accommodate vine rods; the moveable ladder; and perhaps the door locks (it would be interesting to establish if the maker is represented on other glasshouses of the period).

2.3 Further investigation and fabric analysis required

The 2013 analysis raised a number of questions, which the 2015 works partly helped to answer.

- Robin Dower observed the relative height of the thresholds (set awkwardly high) compared with the present floors of the range today. This was not resolved by the 2015 works. An area for further investigation might be to establish if the steps at the partition are part of the original build.



The well worn steps at the central partition suggest a long period of use. The heavy iron partition door is harr-hung, turning on pintles top and bottom. 2013

- Another area for investigation would be to establish if there are/were flues or runs of heating pipes below floor grilles, since robbed away. A useful comparison might be made between the relative height of the stub of cast iron heating pipe in the back wall of the eastern part compared with the threshold heights to establish if it is below a putative floor height based on the thresholds. The 2015 work has not thrown any further light on these questions – there remains considerable archaeological potential at the site to determine the original layout of the interior and the original heating arrangements.



Opening in the back wall - for pipework or flues? at the west end of the range. The step here is inconveniently high and may be a later addition. 2013



Stub of cast iron heating pipe at the east end of the range. Removal of render here would perhaps reveal another pipe below (providing flow and return) both perhaps set into an earlier flue opening (c.f. above photo of west end)

- Was there a forerunner of the modern roof support arrangement in the glasshouse (evidence for earlier bases?). The 2015 repairs indicated that, given the span of the roof, there may have been a forerunner for the current internal roof supports though the (clearly modern) bases were not investigated further.

The steel purlins are not original (though they appear to be re-used from another earlier function) and the support pillars are modern. Robin Dower recalls a conversation with Dennis Burton, a former owner of Felton Park, who knew an old lady in the village who had been 'walking out' with one of the gardeners in the 1930's and said that she remembered a more elaborate line of support with cast-iron spandrels carried on slender columns down the centre of the Glasshouse.

Additional clips to secure the wrought iron glazing bars were attached to the support purlin at intervals as part of the repair work in 2015.



The support purlin passing through the internal partition. The join here may have been designed to accommodate thermal movement of the purlin. Sept 2015



Fish plate joining sections of the purlin in the eastern part of the range. Note clips securing glazing bars to the purlin and arrangement for hanging the vine training wires from the glazing bars

- An outstanding question from 2013 was what the junction of the glasshouse with the wall head looked like. Improved access during the 2015 works confirmed the arrangements at the wall head. The glazing bars are hooked over the top rail. The moveable ladder runs on the stonework on iron rollers similar to those running in the bottom gutter.
- The curved ladder running on rollers at the top and bottom of the roof is presumed to be original (or at least an addition to the expanded construction of the range, as it serves both eastern and western parts).



Ventilation opening at the top of the back wall. The arrangement for notching the top of the glazing bars over the top rail can be see top right



The western wheel at the top of the moveable ladder. The eye may have been used to tie a rope used to assist in moving the ladder



The moveable ladder and top hung front sashes 2013

- In 2013 the question of any further evidence for the phasing of eastern and western halves – beyond the change in materials of the north face of the north wall and the variation in the stays in the front sashes – was raised. The 2015 work involved cleaning and repair of the ironwork frame which allowed a better understanding of how it was constructed and Robin Dower observed some variation in the components used in the construction of the iron sill sections along the front wall in the two halves.



Does the change of materials at the wall head from stone (eastern half) to brick (western) reflect phasing in construction? [N. face]. Slippage of the potting shed roof caused by failed truss. 2013

- As mentioned under glazing (above) Robin Dower made the observation that the putty for the glazing in the interior partition was only on the west side, perhaps pointing to this having been the outside of the first phase building.
- What were the original floor levels and is there remaining below ground evidence for the original or an earlier layout of the interior? This question remains unresolved.
- Any evidence for a vine border outside the vineries? This question remains unresolved.
- Evidence for heating arrangements – circulating hot water (the stub of one cast-iron pipe remains in the back wall of the eastern half)? Earlier flue heating arrangement? Revisiting the site in 2015 confirmed that the stone bases for heating pipes remain in the eastern half. A further small diameter cast-iron pipe was noted in the back wall of the eastern half, close to the internal doorway.

- What is going on below the potting shed floors (and in the dividing wall with the glasshouse) at both east and west ends – any sign of furnaces/flues or boilers? Further investigation of the potting shed floor at the western end in 2015 indicated possible remnants of flues from an earlier furnace and flue heating arrangement.

As already observed there remains considerable archaeological potential at the site to determine the original layout of the interior and the original heating arrangements.



Curving brickwork hints at a heating flue run in the floor of the potting shed towards the western end. 2015. It would be useful to see more of the area at present covered by a concrete floor



Odd blocking or rebate in dividing wall at E. end of potting shed range. Remnants of embedded metalwork. 2013

- A further unanswered question remains what is represented by the change in level outside the east end of the potting shed range and the curious built up brickwork in the return between the garden wall and the east gable of the range.



Why the awkward “step” up to the garden door? Odd brickwork in the corner between the shed and the wall (concealed by ferns). Note relative height difference between levels of shed and garden door thresholds. What is the relationship between the original C18 wall coping and the “lift” for the glasshouse? The potting shed range does not seem to be bonded with the C18 wall (indicating addition). 2013

- There is potential for identification of surviving early glass in the potting shed windows. The surviving bullions suggest the use of (cheaper) Crown glass for these non-show areas. There is still potential for further specialist analysis of the glass.
- The potting shed roof timbers would repay some further investigation of the variations between use of sawn or dressed timbers and the numbering of the carpenter’s assembly marks which suggest a degree of continuity in the assembly of the eastern end of the roof but the sequence ends (before the mid point sadly, which might have been another clear indication of phasing) and there has been some replacement of timbers in the western half. The 2015 work confirmed that the roof had been altered at some point in the building’s life, resulting in some awkward placing of trusses over the raised window lintels.



Earlier truss form showing assembly numbering in eastern part of potting shed range.
2013



Six panel door between the potting shed and glasshouse. Clearly re-hung but is it the original and if so does the style help with dating? Twin keyholes and the shadow of another lock box suggests replacement. Shed (N.) side. 2013

3. An evaluation of the historic environment interest of the curvilinear glasshouse and potting shed range at Felton Park, Northumberland.

The regional HAR team commissioned the 2013 evaluation to build on the already substantial body of recording and investigation undertaken by the architects, Spence and Dower and to test the significance of the building in its local, regional and national context. This will help to justify the substantial funding required to conserve the building for the future.

Particular areas of enquiry were to establish just how rare the building is, both in the region and nationwide; and to describe the local context of the building.

Research was undertaken using primary documents (principally maps and plans and old newspapers) and secondary sources, both web based and published (contemporary and 20th-century accounts); and an illustrated summary of the building was circulated to the Walled Kitchen Gardens Network, via the Association of Garden Trusts to the various County Gardens Trust's and the Garden History Society to establish, through members' knowledge, what other examples of the type of building have survived.

3.1 Rarity, in a local and national context

(see also Appendix 1 –The Felton glasshouse range in a regional and national context).

The Felton Park lean-to vinery range is one of just a small number of surviving early C19 glasshouses in the North East, and as a curvilinear form utilising cast iron for the more substantial components and wrought iron for the glazing bars it is almost unique as a surviving example of its type in the region – only one other surviving curvilinear lean-to range has been identified, that at Castle Eden in County Durham. Given its location and size the latter building was probably devoted to the growing of exotics.

The footings of another vinery range remain in part at Gibside, Tyne and Wear but the ironwork is gone.

Parts of the ironwork of a further curvilinear structure are in store at Beamish museum but these have been brought north from the south coast.

The national picture in terms of rarity suggests that, while there are some 528 Listed nineteenth-century glasshouses of some form (NHLE), there are only some twenty surviving metallic curvilinear structures, and amongst these, lean-to ranges like Felton are a minority within the set.

There are several peculiarities of the structure at Felton which also make it an unusual example of its type, both in the North East and nationally. The rebates cast into each of the opening casements along the front wall to admit the vine rods do not seem to have a parallel elsewhere [though documentary work in 2015 has established that they were used in the late 1830s at Ashridge Park in Hertfordshire] and the moveable access ladder seems to be an unusual survivor.

The “segment of an ellipse” longitudinal form of the glazing bars is also not seen in the other surviving ranges, which favour the simple “half moon” curve.



The profile of the glazing bars is unusually steep where they rise from the front wall and then unusually shallow up to the wall head (leading to concern about stability in conditions such as heavy snow loading). West gable.

The broad statement in the listed building description that the Felton building is an “unusually early” example may not be the case. The quality of the building, its construction and map evidence, suggests a date range from the 1830s to the 1840s rather than the development phase of curvilinear glasshouses in the 1820s and that the building is the work of an established manufacturer.

3.2 Heritage values and significance

(see also Section 1 – The greenhouse in its local context - Felton Hall and Felton Park, Felton, Northumberland).

The heritage value of the glasshouse and potting shed range is high, representing as it does the developed form of this type of structure (see Section 2 – Who built the glasshouse...?). Its significance is also high (see Statement of Significance, below).

The glasshouse range and potting shed have their own heritage designation as a Grade 2* Listed Building [List Entry Number: 1154561].

Other related “Heritage Assets” are the C18 garden wall [List Entry Number: 1041874].; the remaining wing of the house [List Entry Number:1303774] ; the C18 ice house [List Entry Number:1303719]; the mid C19 private chapel which served the house [List Entry Number: 1371126] ; the late C18 entrance lodge [List Entry Number: 1154724] and the nearby bridge with fine ornamental ironwork [List Entry Number:1041880] (all Grade 2 Listed buildings).

3.3 Statement of Significance for the curvilinear glasshouse and potting shed range at Felton Park, Northumberland.

The principal significance of the building is its rarity as a substantially intact example of a curvilinear metallic glasshouse built, apparently in two phases, as a lean-to range against a heightened existing garden wall. Surviving lean-to curvilinear ranges are a small minority within the already small number of surviving metallic curvilinear structures in the country.

The building has high evidential value with much scope for recovering further information from the structure. It also has high historical value both for the way it illustrates the commitment of past owners and head gardeners at Felton to horticultural endeavour and from the ways which it demonstrates the development and adoption of technological changes in horticulture and manufacturing on a national scale. The design value is also high, with a number of features not seen in the few surviving other examples of lean-to curvilinear ranges of the period. The building's aesthetic value is also high as it remains a striking principal feature of the garden today. In 2013 communal value had yet to be proven but there seemed to be considerable scope to develop this value as part of a project bid. This proved to be the case with the development of the 2015 repair project being accompanied by a website with regular updates as the work progressed; successful “walk and talk” events with the project architect and a study day towards the conclusion of the repair project which shared the new information gained during the repair phase and the wider context of the building.

Evidential value - The potential of the glasshouse and potting shed range to yield primary evidence about past human activity is high. Evaluation of the site has identified the glasshouse as an interesting structure because of its use of developing technology (iron and glass) and because others of its type have not survived well. No historic drawings or other documentation survive so it is the structure itself which forms the record for a type of building which is perhaps under-recorded and consequently not well understood. The potential for recovery of archaeological information is particularly high in the interior of the glasshouse range to establish original interior layout, floor levels and the nature of heating systems. The horticultural operation of the building may be further investigated by work to establish if evidence survives for an associated vine border in front of the building. The associated back shed range was integral to the successful operation of the glasshouse and despite alterations to floors and internal divisions much

information is likely to remain to be recorded from below floors and in walls and the historic timbers of the roof.

The value of the glasshouse and potting shed range as a rare survivor of its type is recognised by its designation as a Grade II* Listed Building.

There is still potential to recover evidence about the relationship of the building to the wider designed landscape at Felton, though the seeming scarcity of documentary information for the site may prove a limitation. Archaeology may help with recovery of paths and a gazetteer of surviving features (including historic plantings) might be usefully compiled.

Historical value – The glasshouse and potting shed range garden has a high potential to demonstrate a number of ways in which the present can be connected to past people, events and aspects of life.

At a national level the building represents the application of developing technology (in particular drawing on the invention by J.C. Loudon, landscape gardener and horticultural writer 1783-1843, of the curved wrought iron glazing bar which allowed the curvilinear form of glasshouse – thought to capture the sun's light most effectively) to further experimental research in horticulture which was developing at a great pace and was encouraged by the support of publications such as Loudon's *Gardener's Magazine* (1826 on) and *Encyclopedia of Gardening* (first published 1822). Loudon had published on his idea for the glazing bar in 1817 but subsequently sold the concept to the ironwork manufacturer W. & D. Bailey of London who took out the patent on it in 1818 and went on to develop some spectacular curvilinear buildings. Publication of the idea allowed other manufacturers to develop the technology independently in response to demand and it seems likely (based on the only named component) that the Felton glasshouse was a product of the Midlands where a number of manufacturers were established by the 1830s.

At a local level there is the succession of owners and tenants of the house who all contributed to the development of the site. In the later eighteenth and early nineteenth century Ralph Riddell was perhaps better known for his success as an owner of famous race-horses but nevertheless developed a successful productive garden sheltered by the long garden wall with its heated flues. The wealth which drove this activity came from the exploitation of coal and this continued to fund the estate into the nineteenth century which saw the development of a fashionable pleasure ground, unifying the surroundings of the house and the productive garden. Like many smaller estates in the county the declining fortunes of the North East coalfield, agricultural depression and social changes during the twentieth century saw a period of decline, hastened by Wartime occupation of the house and park by the army, which saw the old mansion pulled down in the 1950s, leaving the wing which remains today. The period which saw the glasshouse and potting shed range built at Felton holds considerable fascination for many – representing a high water mark in horticultural excellence which resources, both financial and in availability of skilled labour, have not been able to match since.

The building illustrates the high standard of manufacture and assembly which had been achieved by the 1830s with a number of regional suppliers advertising their services to both design and supply horticultural buildings countrywide (the developing railway networks greatly facilitating this).

The rarity of the building adds to its interest as a survivor of this period of development. As a reasonably complete example of the form the building also effectively illustrates the survival of relationship between form and function, with the arrangements for cultivating and training the vines and providing ventilation still evident. Although there have been some modern interventions to the structure (such as the removal of the eastern door and its replacement with a wider doorway to allow garden machinery access) and removal of obvious remains of the original heating arrangements, some clues remain and more information may yet be recovered from the structure.

Communal value – The glasshouse and potting shed range has considerable potential for exploring what it means as a place for the local Felton community who relate to it, and whose collective experience or memory it holds. The estate clearly had a long association with village events, such as the annual Flower Show, held in the grounds; and the gardeners were regular and successful contributors to local and regional shows. There is an active Felton and Swarland Local History Society. There is scope for work on capturing the memories of local people and exploring local newspaper accounts, Census returns and Trade Directories to extend that memory further into the past. The positive response from around the country to the request for information on surviving similar structures shows that people are interested in finding out more about such structures and campaigning for their survival and the restoration of glasshouses (and demonstrating old gardening techniques) in walled gardens has been something of a success story in recent years. The 2015 access events have proved popular, drawing visitors from the local community and the wider region.

Aesthetic value – In 2013 it was possible to state that:

Even in decay the glasshouse is a spectacular, and because of its private location, rather unexpected, “find”. With its associated potting shed range the building has the ability to contribute to the ways in which people derive sensory and intellectual stimulation from a place. Visited on a damp autumn day, the interior was atmospheric with the light filtering through the various shades of the small pane glass. It still provides the primary “incident” on a visit to the garden. The principal north /south walk of the garden, still lined with old fruit trees, remains aligned on the centre of the (older?) eastern part of the range. Old plum trees remain against the garden wall nearby, and the garden pump remains as a reminder of all the work which went into the garden over several centuries, contributing to a feeling of stability and permanence. There is something more elegant about the curvilinear form of the glasshouse range, compared with the more workmanlike standard form of the typical lean-to range with its flat planes.

Following the repair project, and newly painted, in September 2015 the vinery range looked its best for the study day towards the end of the month, shining across the garden and the newly re-roofed potting shed range had lost the sad air which it had in 2013.

Design value

(See also Section 3 – Who built the Felton Glasshouse?)

The design value of the building lies in it representing a period of developing interest in the scientific approach to horticulture – how to make the most effective structure for the task in hand – and the willingness to experiment with new materials (cast and wrought iron and glass) to achieve that. Although Loudon had started the ball rolling with the design and use of wrought iron for glazing bars which allowed the formation of the curvilinear form, thought to maximise the light reaching the house; it was the practical iron founders who took up the ball and ran with it, pushing the technology further and further and achieving some truly spectacular structures as the century went on.

The quality of the Felton glasshouse strongly suggests that it was the product of an established manufacturer who was capable of dealing with the design, fabrication and assembly of the iron components to a high standard, perhaps liaising with the estate masons and carpenters over the formation of the base and alterations to the existing garden wall and the building of the potting shed range. There is much more to learn about certain design aspects of the building such as its earlier internal layout/layouts and the heating arrangement(s).

The contribution of the building to the history of horticultural practice and improvement

The contribution of the building to the history of horticultural practice and improvement is that it represents a tangible example of the rapid development of horticulture during the nineteenth century, when a combination of technological advances; the transfer of skills, particularly through the greater availability of published material and the rise of horticultural societies; and the increasing availability of plants, both exotic and resulting from propagation, achieved high standards of excellence. The Felton curvilinear range represents the owner's interest (and considerable investment) in the garden; and the garden as a whole (and by association the owner) was represented in the wider region by the success of the Head Gardener at local and regional horticultural shows – reported even more widely by contemporary newspapers. The building was clearly intended for use as a vinery, probably in two parts to accommodate early and late varieties of grapes, grown for the table. The two old camellias now growing in the eastern part are of some historical interest in their own right, particularly if the *C. japonica* 'Chandler's Elegance' is shown to be an early example (the variety was first raised by Mr Chandler in the early 1830s). They could of course have been planted much later in the century, perhaps in keeping with the Japanese plantings noted by Tomlinson in the 1880s.

In conclusion, the Felton glasshouse and potting shed range are an interesting and rare survival from a period of great developments in horticulture and horticultural technological improvement. The development of the garden at Felton during the middle decades of the nineteenth century reflects the changing fashion in the layout of the pleasure ground with the glasshouse range forming the primary attraction on the circuit walk through the productive garden. In 2013 there was potential (with the owner's agreement) to introduce visitors to the garden and engage their interest in its history and the survival of this special building and in 2015 with visits, virtual and actual, this has proved to be one of the successful outcomes of the repair project.

Appendix 1. What survives today?

In the North East

Only one survivor (in addition to Felton Park) is known:

Castle Eden, Co.Durham

A small lean-to range on the south wall of an ornamental lodge in the pleasure grounds close to the house.

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1323118>

An archaeological survivor:

Gibside (Tyne and Wear/ old Co.Durham)

The majority of the footings and the (partly re-built) back wall of a hundred foot vinery range survive in the walled garden. Not designated, though the garden wall is:

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1025168>

Loudon's correspondent, the newly appointed Head Gardener at Gibside, in *The Gardener's Magazine* 1834, describes (p.364):

"A range of old dilapidated hot-houses, that, at one time, occupied all the north wall, are giving place, by piecemeal, to a range of metallic houses on the curvilinear plan, to be heated by hot water: these, when finished, will have a grand appearance."



The pitch of the curvilinear roof survives in the eastern gable. The C18 walls of the garden were raised to accommodate the new range. This section of the footings was removed to accommodate a pheasant rearing operation in the C20 – which also resulted in the louvered openings to the left.



Part of the front wall of the range. The iron glazing bars were leaded into the stonework of the front wall which also incorporates a gutter. The lower ventilation was controlled by iron shutters worked by an iron rod running through the stonework. The hooks on the wall at each opening suggest that an additional shutter could be added to improve insulation in cold weather. Openings in the stonework allowed vine rods to pass into the interior of the vineries.

At **Alnwick Castle** in Northumberland the two derelict curvilinear ranges in the walled garden were demolished (c.2000) for the making of The Alnwick Garden visitor attraction.

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1371325>

In 1827 Richards and Jones [who were working for the Duke of Northumberland at Syon] were “now engaged in erecting a most extensive range of the same kind at Alnwick Castle”. [J.C. Loudon, in a section of his publication *The Gardener's Magazine and Register of Rural & Domestic Improvement*. Vol.2 ,1827, p.108].

In 2015 research [ongoing] by Jenny Proctor of Pre-Construct Archaeology, including access to the estate archive at Alnwick, has thrown further light on the development of the glasshouses at Alnwick. A Bill [Alnwick Castle archives ref. DP/D3/1/43] dated 1836, survives from Bailey of Holborn for the construction of a substantial range of curvilinear peach houses, with two internal partitions, giving three houses served by three sets of heating apparatus.

At **Embleton** in Northumberland the conservatory attached to the former vicarage has a curvilinear roof.

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1041824>

At **Beamish Museum** near Stanley in Co. Durham there are three rescued sections of a glazed corridor from The Vinery, Shoreham by Sea in West Sussex.

See:

<http://www.shorehambysea.com/the-vinery.html>



The three segments, still in their transport cradles

Nationally – beyond the North East

Joanne Freeman, Data Team Officer, Heritage Data Management for English Heritage, kindly undertook a search of The National Heritage List for England database in Internal List Access. Under the category of Glasshouse it also includes the terms Camellia House, Conservatory, Fernery, Fig House, Hothouse, Orangery, Orchard House, Palm House, Peach House, Pinery, Temperate House, Vinery and Water Lily House.

a search on all these terms with the date of 19th century returned a total of 528 results. This is every listed building record that is tagged with one of these terms and includes, for example, houses with conservatories attached or entries where the glasshouse is a secondary feature.

The results were trimmed to produce a spreadsheet where the glasshouse was the main feature of the listing (or is mentioned in the title), There are 188 of these.

Jeremy Milln, in his Statement of Historical Significance for the vinery at Millichope Park, Shropshire, drawing on the knowledge of Fiona Grant in this area, suggests that there are “perhaps 20 other” metallic curvilinear glasshouses in the country.

Of these, the majority are not the simple lean-to form like Felton but rather more elaborate display houses (which have consequently been maintained and/or restored and have tended to survive). In some cases the structure is a composite, with the metallic curvilinear construction restricted to the roof.

Fiona Grant has kindly provided information on the lean-to curvilinear metallic ranges she had discovered during her researches. See Millichope Park, Shropshire and the two Scottish examples.

An appeal for information on possible parallels with Felton was sent out, via the AGT, to the various County Gardens Trusts around the country; the Walled Kitchen Garden's Network and the Garden History Society.

A gazetteer of curvilinear structures reported by members of the various County Gardens Trusts and other correspondents around the country:

Bedfordshire

A 2015 addition to the gazetteer:

The Swiss Garden, Old Warden, Beds.

The transept of the grotto is a curvilinear glazed structure with ironwork made between 1830 and 1833 by the Eagle Foundry, Northampton.

Cheshire

Quarry Bank, Styal, Cheshire

OS Grid Ref: 109:SJ835835

In the Upper Garden there is a small curvilinear display house flanked by lean-to ranges with iron ribs, derelict in 2013 the National Trust were fundraising the restore the building. Manufacturer unknown. Similarities noted with Millichope Park, Shropshire (1825 – 1845).

See also:

http://www.nationaltrust.org.uk/quarry-bank-mill/donate-now/?campid=Affiliate_Mem_AWin&aff=78888

Cornwall

None known. Thanks to Tim Smit and Philip McMillan Browse who both responded with information and offers of support for the project.

Cumbria

Dallam Tower, Milnthorpe. The Orangery.

This is presumably the Beetham building which the Felton Listed Building description refers to.

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1087325>

Devon

Thanks to Jim Carter, John Clark and Ian Varndell of Devon Gardens Trust.

Bicton Park. The Palm House, Bicton Gardens (1825-30)

Attributed to W.& D. Bailey of London, who took on Loudon's idea for the wrought iron glazing bar and manufactured some spectacular structures.

See:

<http://www.bictongardens.co.uk/index.php?route=product/category&path=66>

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1097548>

Greenway

A traditional (i.e. not curvilinear) form of lean-to with curved ends.

Tapeley Park

A very late example of the curvilinear form using reinforced concrete ribs!

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1325335>

Essex

None known. Thanks to Tricia Moxey, Essex GT

Gloucestershire

None known. Thanks to Jane Bradney, Gloucestershire Gardens and Landscapes Trust

Hampshire

Tim Smit recalls “a rounded central house” at Leigh Park, Havant, near Portsmouth (now the Staunton Country Park).

Herefordshire

Thanks to Jane Patton and David Whitehead, Hereford and Worcester GT

Downton Castle, Herefordshire

An early (c.1820), rather experimental, range using W.& D. Bailey’s glazing bars. Built as a pinery but not a great success due to ventilation problems and converted to a vinery.

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1389118>

Hertfordshire

Thanks to Kate Harwood and Anne Rowe

The Node, Codicote.

A free standing glazed tunnel for peaches, attributed to Paxton.

Kent

East Cliff Lodge (now King George VI Memorial Park), Ramsgate.

A fine metallic curvilinear lean-to greenhouse with rounded ends, sited as a focal point for the Italian Garden. Thought to have been designed by Decimus Burton, c. 1831-2.

See: http://thanet.gov.uk/pdf/Greenhouse_lowres.pdf

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1085336>

Thanks to Mellissa Thompson

London area

"The only curvilinear glasshouse in Greater London that I can think of (other than the **Palm House at Kew** and Great Conservatory at **Syon Park**, which are on a rather different scale) is the one at **Nuffield Lodge**, Outer Circle, Regent's Park, London NW1 (City of Westminster). The listed villa is by Decimus Burton, of 1822-4. "The delicate wrought-iron conservatory is contemporary with the house; it is in the form of a segment of an elliptical sphere, the kind of experimental curvilinear profile recommended by contemporary theorists such as Loudon and TA Knight" (Buildings of England London 3: North West. Cherry and Pevsner 1991. p.626).

The C18 house (listed grade II) called **Purley Bury**, Lexington Court, Purley. L.B. Croydon, formerly had a small "old conservatory on the south side with curved glazed roof" (listing description), which from memory was of thin wrought iron with small curved glass panes, but it did not survive dereliction and vandalism in the 1980s. There should be photos in the EH London Region collection and/or Metropolitan Archives (City of London).

JC Loudon's house at **3 and 5 Porchester Terrace**, London W2 (City of Westminster) retains its "domical conservatory" at the centre of the veranda on the street elevation, which is of rendered brickwork with large small-paned sash windows and a hemi-spherical glazed roof with fine curved glazing bars (presumably of wrought iron, although at Syon Park they are of brass or gunmetal) and small curved panes of glass. The "double detached villa" is illustrated in Loudon's *The Suburban Gardener and Villa Companion*."

Thanks to:

Chris Sumner. Chairman, Planning & Conservation Working Group
London Parks & Gardens Trust

Thanks to Mellissa Thompson:

Grove House, Regents Park (may no longer exist)
1820s example in *The Georgian Group Book of the Georgian House* (1995).

Norfolk

Hoveton Hall [Listed II*]

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1049916>

Early C19 greenhouse, using wrought iron components, but is it curvilinear?

Shropshire

Thanks to Fiona Grant and Jeremy Milln for a splendid early example of a metallic curvilinear range at:

Millichope Park, Shropshire

Manufacturer unknown, thought to be 1825-1845

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1001130>

Staffordshire

Thanks to Sue Gregory of Staffordshire Gardens and Parks Trust:

Staffordshire – curvilinear glasshouses

FARLEY HALL

SK-0690-4419

Staffs Moorlands - separate from Farley Park.

CRO: Bill family papers D554, D1234 includes D554/105 1782 plan; D554/140 1850-87 garden journal. D554/105 plan 1781. 1851 - John Bill Esq

NMR SC00932: Sale Papers for Farley Lodge, Farley Cottage 1918:

2011: The Farley estate passed to Richard Bill of Norbury, Derbyshire by marriage in 1607. He built Farley Hall shortly afterwards. There were extensive alterations in 1784 by Thomas Gardener of Uttoxeter. Members of the Bill family were land agents for the earls of Shrewsbury and Gower and the Marquess of Ailsbury (sic). The formal garden sloped sharply upwards behind the house and

was walled. The glasshouse now at Farley Hall is of unknown date but it is almost a perfect semi-globe as recommended by Loudon in his remarks to the Horticultural Society in 1815. Grade II listed [photograph: NMR BB79/08450].

<http://www.britishlistedbuildings.co.uk/en-275114-farley-hall-and-attached-wall-greenhouse>

HILTON PARK

SJ-9560-0497

Essington , South Staffs

REFS: W Pitt General view of agriculture of...Stafford 1796, 96. G Carter et al. Humphrey Repton 1982, 161; 'A History of Hilton Hall' by Cherry Ann Knott 1989.

CRO: Vernon family papers D(W)1790; D351/M/B/186 & 188 1815 map Hilton Park Estates. Some material kept at the Hall. EH Survey 1993. The Historic Gardens of England:Staffordshire (2009) p9.Repton Red Book believed to be in possession of Vernon family.

1851 - H.C.W. Vernon Esq

House built c1720 for Vernons , possibly by Trubshaw, surrounded by moat . Area around house has been modernised with hard landscaping, fountain & shrub planting. Kitchen garden walls extant but a road has been made through the centre. Portobello Tower built mid 18C as an eyecatcher in the park, named to celebrate victory of Admiral Vernon in the West Indies 1739. This replaced an earlier obelisk. Iron framed curvilinear glass house, circa 1820, in grounds near house, in ruinous condition. Extensive water features & good woodland belts survive , but extensive open cast mining, motorway & services, gravel pits, electricity substation on site, now also threatened by urban development.

<http://www.britishlistedbuildings.co.uk/en-271783-the-conservatory-hilton-staffordshire>

Sussex (West)

The Vinery, Shoreham by Sea

Glazed corridor (no longer in situ).

See Beamish Museum Co.Durham (NE region examples above)

Warwickshire

Thanks to Mary Bishop of Lancashire GT

Bitham Hall, Avon Dassett

A very elegant and unusual $\frac{3}{4}$ span form which overcame the need for a high back wall. As Mary says - a very beautiful example.

NHLE entry suggests c.1860

Yorkshire

Sheffield

The Glass Pavilions, Sheffield Botanic Gardens

Robert Marnock, gardener of Bretton Hall was employed from 1834 to design the gardens and be the first Curator. Opened 1836. He went on to design the gardens of the Royal Botanic Society, Regents Park.

The domical conservatory at Bretton Hall, 100 feet in diameter and 60 feet high, was built by Messrs Bailey of Holborn in 1827. Although spectacular it was difficult to heat.

Thanks to Mellissa Thompson:

Howsham Hall, Howsham. Orangery. Pre 1832?

Park and Garden entry:

<http://list.english-heritage.org.uk/resultsingle.aspx?uid=1001427>

Scotland

Thanks to Fiona Grant for two examples of metallic curvilinear lean-to ranges from north of the border:

Brechin Castle, Brechin, Angus

The castle has a 13 acre walled garden and in an annex to the north is the kitchen garden area including a unique curved Victorian peach house.

Canmore ID 193351

NO5923 5967

Brechin Castle Peach House. (Photo F.Grant)

Not only is the form curvilinear but it follows a curved wall too!

The Gardeners Chronicle and Agricultural Gazette Vol.25, Oct 1865, p.1004
Has an advertisement by Alexander Shanks and Son, Dens Iron Works, Arbroath, N.B. and 27 Leadenhall St., London. They advertise Iron Horticultural Buildings (designed by Mr Halliday, chief gardener at Scone Palace) with “elliptic

girders made of cast iron – quite light but made strong by means of simple tie rods” and describe an “Iron orchard house erected by them in the grounds of Brechin Castle”.

Stracathro House, Brechin, Angus

NO 62230 65450

The peach house on the north wall of the walled garden is thought to be c.1830
RCAHMS E 38915 and 38939-943

Ireland

Longville House/Longueville House Hotel, Mallow Co.Cork.

Conservatory – a late example of the work of Richard Turner of Dublin and said to be 1862.

<http://media-cdn.tripadvisor.com/media/photo-s/02/e2/c7/ab/longueville-house-hotel.jpg>

Maybe the profile is too steep to bear comparison with Felton? And it is not a lean-to (but half a free standing curvilinear structure would serve for a lean-to!).

Palm House, Botanic Gardens, Belfast

Again by Turner. 1839 with later modifications. Maybe the profile is too shallow to bear comparison with Felton?

<http://www.victorianweb.org/art/architecture/iron/23.html>

Sources

Primary

1777 Estate plan at Northumberland Collections Service, Woodhorn

Ordnance Survey maps and plans.

Felton Park Glasshouse M430. Report Sept 2012. Spence & Dower LLP, Chartered Architects and Historic Building Consultants.

Drawings by Spence and Dower, Architects (March/ April 2012): M430/01 to M430/05

Old newspapers at Newcastle City Library (particularly the *Newcastle Courant*)

Secondary

E. Mackenzie `... View of the County of Northumberland...' 1825, Vol. 1

Parson and White's History, Directory and Gazetteer of the Counties of Durham and Northumberland Vol. II 1827

Hodgson J.C. A History of Northumberland Vol. VII 1904

Hutchinson W. A View of Northumberland 1778

Loudon J.C. *The Gardener's Magazine and Register of Rural & Domestic Improvement*. Vol.2 ,1827

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Milln J. *Millichope Park, Shropshire. Vinery Range – Statement of Significance* 2013

Tomlinson W.W. 'Guide to Northumberland' 1888

Wallis J. The Natural History and Antiquities of Northumberland Vol.2 1769

West W. The history, topography and directory of Warwickshire 1830

Websites

National Heritage List for England – Listed Building descriptions.

British Newspaper Archive

<http://feltonparkgreenhouse.org/>

And links for individual sites in Appendix 1