

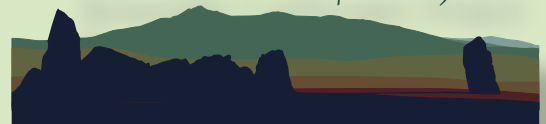
DRUMINNOR CASTLE EXCAVATIONS, 2012-2022

INTERIM SUMMARY OF FINDINGS

Colin Shepherd for the
Bennachie Landscapes Project Fieldwork Group
Geology Report by Andrew Wainwright



Bennachie Landscapes Project



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Introduction

A number of papers concerning these excavations have appeared over the years, which are noted in the bibliography at the end of this report. However, some of the assumptions contained in them have now been superseded by more recent findings. Therefore, it seems appropriate to provide a brief, updated summary based upon those new data. The detail underpinning the present conclusions will be reserved to the final report. (However, as we seem to be digging with no foreseeable end in sight, this present interim seems especially necessary!) This summary presents an understanding of the developmental process of the castle as based upon the findings to date. But, it should be noted, we've had to revise our assumptions on numerous occasions so far and there is no reason to believe that they are not going to be altered again(!).

To re-cap: at the outset of the project, Druminnor Castle was considered to have comprised the present hall-house attached to a tower appended to its north-west corner (Slade, 1967). This was demolished in 1800 (Leyden, 1903, 229) and replaced by a Victorian mansion, designed by Archibald Simpson, in the 1840s (http://www.scottisharchitects.org.uk/building_full.php?id=403112; Slade, 1967). The discovery of two estate plans and sketches (RHP 260/1/a; RHP 44705), dating to the mid 18th century, demonstrated that the castle had been much larger, comprising two courtyards with the 'Old Tower' - so-named in the Barony Court records (SHS, 1919) - situated on the north-west corner of the upper courtyard. This courtyard was labelled 'the Close' on the c.1771 plan (RHP 260/1/a). The excavations aimed to confirm the veracity of the estate plans, to try to find dating evidence for the construction of the castle and to seek to understand the architectural development of the castle. Subsequent 'project creep' has led to a deeper consideration of the geology of site, owing to the apparent importance of that factor to the initial choice of site for the castle.

Phase 1

It is believed that the Old Tower was the earliest feature on the site that survived to be recorded, both in drawn and documentary form. It appears to have been built immediately onto basalt and sandstone bedrocks, thus negating the need for any foundations. However, a late medieval well - discovered by geophysics (see Photo 1) - supports other excavated and documentary evidence for the position of the tower. The date of the tower is conjectural but may, arguably, suit a 13th-century horizon, in accord with other towers across the North-east, such as Drum and Dunnideer. The position of the existing hall-house, built in the first half of the 15th century (see below) and hanging out across a scarp overlooking the Kearn Burn, suggests the tower had already been built by that time. The granting of a charter to Duncan de Forbeys in 1271x2 (Ill., AB, iv, 372) may or may not be coincidental to the tower's demonstration of empowerment.

At the time of its demolition, the tower stood five or six storeys high, though it is unlikely that it was originally built so tall. It probably stood within a larger enclosure, of which no trace has yet been found. This would have been essential in order to house the service buildings required by a noble household:



Photo 1. Late medieval well under excavation.

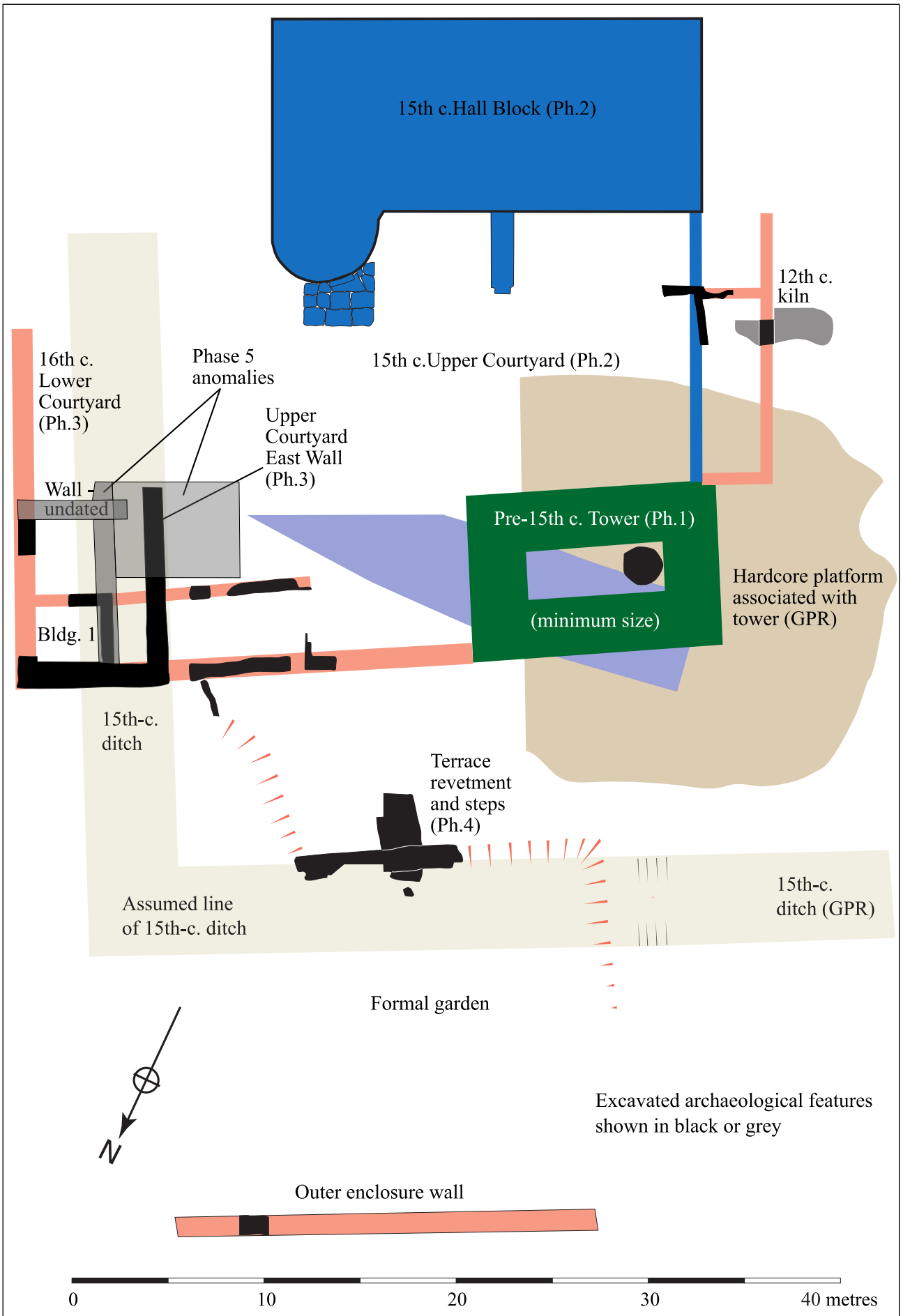


Figure 1. Schematic site plan showing excavated features and suggested dating.

stables, kitchens, buttery, brewhouse, granary, smithing area etc. It should be remembered that, in the 13th century, the castle was probably also the centre of operations for the demesne farm (the 'Mains'). (A 12th-century kiln indicates the site's economic and agricultural importance in the previous century.) Surprisingly, demesne farming survived at Druminnor into the mid 16th century, if not later, although it had probably been replaced by leaseholds on most of the other lordly estates in the locality. But, by this time, the 'Mains' had probably been moved to its later site by the kirk.

Although no trace of the Old Tower (apart from the well) was found, residual pottery sherds from later deposits suggest habitation on the site during the 13th and 14th centuries. Earlier habitation is attested by a grain-drying kiln but, as this cannot directly be associated with the castle, it will be dealt with separately at the end (see Figure 1).

Phase 2

The construction of the existing tower block may be dated to the mid 15th century by the existence of a receipt for part-payment 'for ye makyn of ye housse of Drumynour' by Jhon Kamloke and Wilyhame of Enverkype, dated July 1440. Later, in 1456, James II granted a licence to build and erect 'the tower or fortalice called Drymynour vulgarly named Forbas in Aberdeenshire', and to fortify the same with walls and circumvallate it with ditches.' (Ill. AB., iv, 400). The recognition of a platform composed of quarried sandstone underlying, roughly, the present car parking area seems to indicate the footprint of the 15th-century castle. This would have coincided with the upper courtyard shown on the estate plans.

The licence may be taken to suggest that the tower and courtyard were built at the same time. However, if Pitsligo was built c.1424 (McKean, 1991, 381) and modelled upon Castle Forbes (371), the respective dates do not agree. Druminnor would have had to have been built after Pitsligo, but for which it was supposed to have provided a template. The wording of the licence may well have been formulaic. The defensive ditch, as excavated (Photo 2), defines the area of the platform and returned C14 dates from the first half of the 15th century. The ditch itself accords with the footprint of the upper courtyard. In other words, the upper courtyard appears to date to the first half of the 15th century and comprised at least the present hall block as well as the tower along with a defining barmkin, probably with further internal ancillary buildings.



Photo 2. The defensive ditch showing sandstone bedding in base.

The 'skirt' associated with the tower was made from quarried sandstone, packed to create a dense matrix. The 'platform' underlying the rest of the upper courtyard was redeposited sandstone-derived material of a more heterogeneous nature. Although providing a dense and structurally-sound foundation, it lacked the single-source nature of the tower 'skirt'. The former appears to have derived from the immediate surroundings, including from the excavation of the ditch, whilst the latter appears to have been 'brought in' from a purpose-dug quarry.

Phase 3

During the later 15th century, the barmkin wall was moved eastwards and a lower courtyard constructed. This was built across the earlier ditch. Within the north-east corner of the lower court stood a small, square building (Building 1, Photo 3). Its west wall was built directly over the middle of the infilled (and forgotten?)

defensive ditch. It duly suffered subsidence and was re-built, using the basal part of the first wall as a foundation for its replacement. The building had a series of mortar floors that had, likewise, subsided into the former ditch. This appears to have been a fairly gradual affair with the sunken portion being overlain with subsequent mortar fills in an attempt to try to keep it flat. The rebuilding of the wall may have resulted in the provision of a replacement Correen-slabbed floor and associated drain. Although made with prestigious stone, this was a fairly 'bodged' affair. The drain was not properly tied into the walls of the building. However, the apparent need for a hygienic working area appears to have persisted throughout the life of this building. For this reason, it has been suggested that it may have functioned as a buttry or brewhouse.



Photo 3. Building 1 under excavation.

The use of Correen stone here appears to be, so far, the earliest recorded use of this fine stone at Druminnor. The quarries lie within the bounds of the historic estate above Druminnor on the Correen Hills and their earliest exploitation had hitherto been dated to the 19th century. The New Statistical Accounts of 1845 stated that the quarry there had only recently been exploited (NSA, 408). It is assumed that their use in the lower court dates to the end of the 16th or early to mid 17th century.

At the moment, the precise nature of the relationship of the lower courtyard to the upper remains anomalous. The former eastern barmkin wall of the Phase 2 courtyard may have defined the dividing line, but this feature has so far eluded detection. The estate plans suggest the two courtyards to have been of more equal area than the archaeology presently seems to indicate, whilst the floor level of Building 1 seems to be lower than the assumed surface of the adjoining courtyard. In fact, the unique depth of Building 1 might almost mark it out as a semi-'basement' room. Furthermore, an unusual east-west wall remains undated, but appears to have been abutted by the outer eastern barmkin. This would suggest, counter-intuitively, an earlier date for the east-west wall than for the barmkin.

Phase 4

Parallel to the barmkin wall of the lower courtyard and standing in the walled garden area to the north of it, was a section of well-made wall, abutted by a rectangular platform on its southern side (Photo 4). The construction of these features removed the remains of the defensive ditch in this area. No sign of this robust feature is shown on either of the estate plans drawn c.1770 where this garden area is shown as containing trees. Their construction must, therefore, post-date the use of the defensive ditch and, in turn, have been removed before or during the first half of the 18th century in order to have given time for the trees to have grown. To the north of the wall and its platform was a small scarcement, the same width as the platform. North of this was what appeared to be a post-pad and, beyond that, an area of metalling. In fact, two layers were apparent, separated by a few centimetres of soil. GPR shows these surfaces to be fairly extensive but linearly-aligned roughly east-west.

These features are suggested to relate to the laying out of a formal garden during the 16th or 17th centuries. Its exact alignment upon the lower barmkin



Photo 4. Terrace revetment under excavation.

suggests a possible association and, therefore, possibly created as early as the first half of the 16th century. The section of wall does not appear ever to have extended further than as excavated, even though great diligence was applied in looking for associated features, such as post holes or earthen rampart. It had initially been considered that this was a former entrance feature associated with the defensive ditch. Reversing 'entrance' for 'exit' suggested that the platform, which was secondary, may have supported stone steps through a terrace revetment granting access to a lower formal garden. Such a view accords well with the evidence and the metallised surface(s) may then be explained as garden paths. They were certainly not robust enough to represent an earlier main entrance route to the castle. As noted above, the construction of these features explains the absence of the defensive ditch. It would be difficult to imagine a castle associated with a family of such standing that did not have such a formal garden and the site topography makes this the most compelling site. It was still depicted as a large garden enclosure - albeit planted with (?fruit) trees in 1770.

Phase 5

Around 1700, the 12th Lord Forbes was obliged to live in London by the pressures of his debts. His eldest son and grandson (13th and 14th Lords) also lived in London. His 2nd son, Master James Forbes of Putachie, became the tenant of that estate around 1715, and succeeded in 1734 as the 15th Lord. He did not regain possession of Druminnor however, since the 13th Lord's widow had a tenancy for life, and though living in London she refused to allow her brother-in-law any involvement in her estates. So Druminnor continued not to be occupied by the Forbes family, though it is likely it was used by the widow's agents and factors. In 1770, the 16th Lord Forbes cut his losses, selling the whole Lordship of Forbes and buying back only the lands in the parish of Forbes. The buyer of the Druminnor estate was John Grant of Rothmaise, who handed it on to his son Robert. By 1800, a century of neglect had probably reduced many of the castle buildings to near-dereliction. In that year Robert Grant demolished the more derelict buildings including the Old Tower, though retaining the Hall block which he refurbished.¹⁾

Phase 5 may relate to this episode or, arguably, to an earlier period. The archaeological evidence in isolation may suggest the earlier period, but this sits uncomfortably with the evidence presented by the estate plans. The argument turns upon the accuracy of those plans. Sadly, the artefactual remains were scant and ambivalent for dating purposes. Both scenarios are presented below.

At some point, the former north-east corner of the lower courtyard was buried in a deep fill of soil and rubble - presumably from a demolition process - thereby sealing it to be recovered by these excavations. The ground level appears to have been raised in order to provide an extended levelled area at the east side of the new layout. This area was overlain by a large area of robust cobbling that has been suggested as the site of stables (Figure 1; Photo 5). (Alex Forbes astutely noted that he had often wondered where the family had stabled their horses between 1800 and 1840. After 1840 they were known to have kept them at the nearby 'Home Farm'.) The well-built and substantial east wall of these possible stables directly overlay the earlier west wall of Building 1 and the cobbles sealed the former east wall of the upper courtyard. When the destruction of this earlier wall occurred presents a problem.

Interpretation 1 suggests that the later east 'stables' wall may be the east barmkin wall as shown on the estate plans. This would make the measurements of those plans quite inaccurate. However, the stables would fall



Photo 5. Trench 15 with possible later east barmkin wall (behind vertical ranging rod) abutting cobbled building and former east upper courtyard barmkin sealed by cobbles (beneath horizontal ranging rod).

¹⁾ *Grateful thanks to Alex Forbes for this information.*

in the correct relative place as a building shown on those estate plans. Furthermore, the wall sealed by the cobbling - itself, very substantial and bound by mortar - appears not to be referenced at all on either estate plan, though its construction seems to be similar to the north barmkin wall of the lower courtyard. Had the wall been standing at that time of the estate plan surveys, it might be considered unlikely that it would not have been depicted. Finally, Building 1 in the north-east corner of the lower courtyard is also not referenced at all on the estate plans. The suggestion, therefore, is that the estate plans depict a reduced castle footprint and that, formerly, the lower courtyard had extended further to the east by approximately 4 metres.

Interpretation 2 suggests that the later 'stables' and cobbling belong to a short-lived phase of garden planning dated to shortly after the demolition of the Old Tower in 1800. This may be supported by the way in which the cobbling appears to relate to the 19th-century garden paths. However, if Interpretation 1 is correct, the cobbling and stables may simply have been opportunistically retained and enhanced by the garden paths. But, the longer east-west castle footprint shown on the estate plans would suit the notion that the reduced garden was a product of c.1800. (Although Interpretation 2 was my initial view, I am now moving towards a preference for Interpretation 1. However, my track record in this regard is very far from perfect!)

Phase 6

19th-century garden planning was recognised in the form of narrow garden pathing recovered in the earliest years of the excavations. One of these respected the line of the former north barmkin wall, which showed that it had to be in existence while that wall was still standing (Photo 6). Also, parts of the north wall that did survive had to have been above ground level at that time - only subsequently being covered by later 19th-century landscaping. More recent excavation inside the line of the former west range also show the same pattern of early 19th-century cobbling - sealing late 18th-/early 19th-century pottery and glass - respecting the line of the former courtyard wall. It would seem, therefore, that the demolition of 1800 may have left elements of the former upper courtyard to be re-used as a new enclosed garden area.



Photo 6. Early 19th-century garden cobbling.

Un-phased

As noted above, the estate plans show a large area of garden abutting the north range and tower of Druminnor. These were enclosed by an outer enclosure wall. GPR pin-pointed the line of this wall and excavation showed it to be of a robust nature - perhaps more sturdy than required for a simple garden wall. The basal stones were large quarried blocks cut neatly into the natural subsoil in a stepped formation: the northernmost stones laid perfectly horizontal onto a bedding trench with the second (southern) row set higher but still cut into the sloping natural subsoil.



Photo 7. Revetment with possible wickerwork remains.

In front of the wall on its northern side was the course of a former small burn or ditch. The edges of this had been prepared with a clay embankment on the southern side and stone revetting along its northern edge (Photo 7). During excavation the former burn filled with water and had to be repeatedly emptied. The burn would have formerly helped to drain the fields lying along its northern side. Small rods of wood caught in the revetment stones may have been the remains of a wickerwork structure or simply twigs caught in the stones whilst the burn was still open.

Phase 7

In 1840 Druminnor was inherited by the eldest daughter of Robert Grant and her husband, the Foulerton-Grants, who added the 'mansion', designed by Archibald Simpson (http://www.scottisharchitects.org.uk/building_full.php?id=403112). This adjoined the present house at its north-west corner and the plan can be seen on the 1st edition OS, along with the re-organisation of the garden area. The landscaping that followed took the form of raising the height of the former garden to the north to create a more levelled outlook, planted with individual trees. Some of these remain but Dutch elm disease has killed a few fine specimens and a number of horse chestnuts, also dating to that period, have either succumbed to old age, disease or storms. The small burn or ditch fronting the former unphased enclosure dyke was filled in at this time and the enclosure dyke thrown down. This would have permitted a more 'Romantic' and uninterrupted view through to the fields beyond. The 'mansion' was, in due course, demolished in the 1960s.

12th Century Grain-drying Kiln

The earliest excavated remains discovered to date belong to the second half of the 12th century and relate to a burnt grain-drying kiln. This has been reported upon in detail separately (Shepherd, 2018). However, a short analysis of the features is appropriate here.

C14 dating supplied two assessments giving a date from the second half of the 12th century. One sample came from a charred grain of oats and a second from an *in situ* burnt birch post. Extensive environmental analysis of the burnt remains offered important evidence relating to the ecology and management of the Lordship of Forbes at that time. The kiln partly underlies the former west range (the Link Wing) and main entrance pend of the castle. This range may have been demolished along with the tower in 1800 (Leyden, 1903, 229) or just prior to the construction of the mansion. A metre-wide trench, dug for drainage works some years before these excavations, had cut through the foundations of the former mansion and had been left partly unfilled. Cleaning the trench sides showed a U-shaped 'cut' in its eastern (west-facing) side. This was later seen to be the west end of the kiln's flue. The south side of the kiln had been largely quarried during the construction of the Link Wing (and, subsequently, by the Victorian mansion), with a retaining wall built against the quarried side. The lower room of the mansion appears to have replaced an earlier 'basement' at this end of the gatehouse range. The earlier 'basement' may be indicated on the sketches appended to the estate plans. The earlier retaining wall was set behind (north of) the later 19th-century wall but stopped short of the access end of the kiln. Fortunately, these later structures failed to remove the rest of the kiln and its survival, beneath so much later construction and reconstruction, is little short of miraculous.

The kiln is similar to the 'keyhole' structures found at Nottingham (Knight, 2015), Hoddum (Lowe, 2006) and, more locally, at Inverness (Ellis, 2002). The bowl and flue of the kiln were cut steeply into an extremely friable Devonian sandstone (Photo 8). C14 analysis of a charred grain (*Avena* sp.) from the base of the kiln returned a date of 1035 - 1207 calAD at 95% probability (SUERC-67036). This tallies fairly well with a date of 1158 - 1262 at 95% (SUERC-76174) for a fragment of birch from one of the post holes in the bottom of the kiln and suggests a realistic date during the second half of the 12th century. These dates also appear to conform to the architecturally-similar examples found at Nottingham, Inverness and Hoddum. The Druminnor kiln had no stone lining as became common in later times, though, at Abercairney, stone-lined kilns can be seen to have

been already in use from the mid-11th century (Gibson, 1989). The friable nature of the sandstone bed into which the Druminnor kiln had been quarried permitted the digging of the bowl into a stable geological layer. Other beds recognized across the site would have been much harder or softer, suggesting that this bed may have been selected for its potential architectural attributes. The Devonian bedding is clearly visible within its matrix. However, once open to the elements, these beds weather and crumble quite quickly, but does not drain well. In other words, the kiln would have required some form of roofing.

The environmental evidence, described at length elsewhere (Robertson in Shepherd, 2018), suggests that the large stones found in the fill of the kiln's bowl were formerly structural elements; they were associated with scorched clay and charred grain. As their shape and size prohibits their interpretation as being associated with a lining for the kiln, they may have been associated with its superstructure. This would, therefore, lead to the possibility of a stone-built kiln. Such a structure would certainly have helped in limiting the risks of total destruction by fire.

However, this would also have been quite exceptional for the North-east where even lordly residences were rarely stone-built during that period (for example, at the royal castle of Strachan [Oram, 2008, 172] and the comital centre at Rattray [Murray & Murray, 1993]). The Fisher Gate kiln had a superstructure made of wattle, as shown by the evidence of stake holes around the rim (Young, 1982), but there was no evidence at all for that at Druminnor.

Of speculative interest at this point is the recognition, close by, of a short length of walling bonded by what looks like the same material associated with the infilling stones of the kiln, which were presumed to relate to the kiln's superstructure. This wall, though sealed within later walls associated with the west range and the subsequent 'mansion', lay on a slightly different alignment to those later walls. The earliest wall appears to have stopped at a neat 'corner stone'. Sadly, no dating material has been forthcoming. But, its position with regard to the kiln suggests a possible connection. We can go no further than this in the absence of any stronger proof. But, it is worth recording the possibility that the kiln may have sat within a stone-built 'kiln barn'. The only major obstacle to such a possibility at the moment is the absence of any other examples from the north of Scotland. Stone-built kiln barns existed at Hoddom between c.800 and 1000, though they seem to have fallen out of use thereafter (Lowe, date, 102). Clearly, future archaeologists should consider looking out for evidence of such structures in 12th-century lordly environments in the north of Scotland.



Photo 8. Kiln showing burnt grain deposit and infilling stones.

The Geology of Druminnor
Notes on the Devonian Geology Exposed in Trench 14
Andrew Wainwright

This note describes the geology exposed in trench 14 by the excavations during 2021. The north end of the section exposed in 2019 was not examined in great detail by a geologist before being backfilled and is not covered here. Figure 2 shows the general geological siting of Druminnor and the subjects of this present note are presented here as Figure 3. In the southern end of the section below the archaeological remains there is a well developed glacial channel cutting into Devonian sediments.

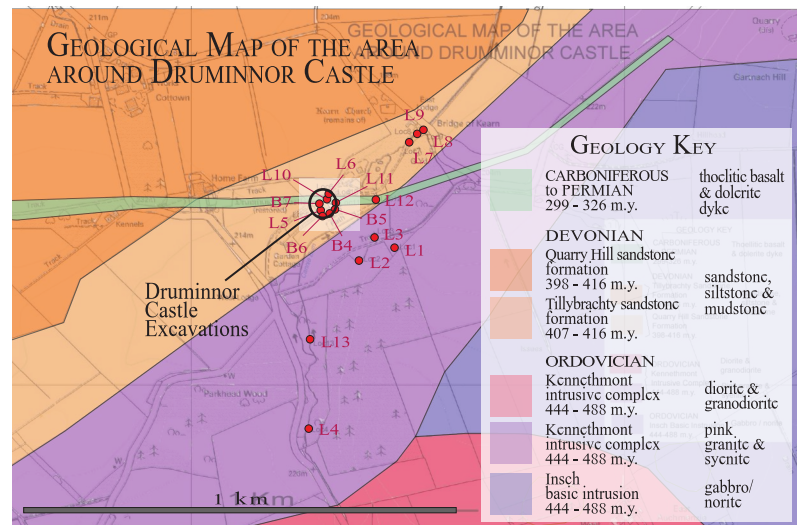


Figure 2. The geology of the Druminnor area.

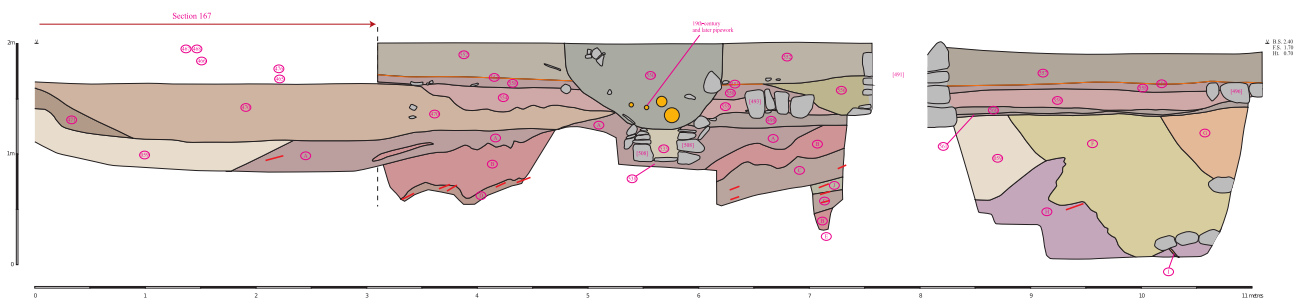


Figure 3. Section through the described geology.

Weathering

During the 2021 season it was possible to study the details of the Devonian section exposed in Trench 14. As a result the effects of weathering is now better understood and what has been seen in other trenches can now be appreciated.

The Devonian section would have been exposed for a very long time prior to the glacial period. For most of this time erosion would have predominated, removing sediments and exposing fresh material underneath. However during the glacial period erosion was not the most important factor in the changes seen to the Devonian section. Instead arctic conditions prevailed and over the area around Druminnor at least erosion was not significant. It should be appreciated that under these renditions and at this latitude twelve months of deep freeze was not the norm. In modern arctic environments the long winters are extremely cold but the brief summers are quite warm. So although the ground is frozen solid for several hundred meters, the surface meter or so thaws every summer. The water is unable to soak away and viscous mud covers the surface and will move slowly downhill.

The term 'glacial' should normally be applied to the action of glacier ice: its erosive effects, the formation of U-shaped valleys, etc. These were not a major cause of weathering here. Instead the main modification of the Devonian rocks was by 'periglacial' action, processes under arctic conditions but not actually caused by glaciers. The principle agent here is 'freeze-thaw', the annual freezing and thawing of the surface sediments and rocks. As water freezes it expands so the rocks go through an annual expansion/contraction cycle, which will weaken them and cause the outside layers to break away. Because of the physics of it, the fragments will lose their corners first causing them to become slightly rounder and separated by the disaggregated material.

These processes are well seen in Trench 14. The most obviously effected are the sandstones, which would originally have been quite hard but containing a fair amount of water between the sand grains ready to expand and contract. In the upper part of the section no actual beds of sandstone have been seen, only beds of hard sandstone rubble. The clasts are usually in the 50 to 100 mm range and sub-angular to sub-rounded, and separated by a matrix of the same basic sandy material.

The argillaceous sediments, mudstones and clays, are less obviously effected. Individual beds can be followed for short distances. However some modification has taken place as many of the beds have a very soapy texture. The freeze-thaw effects are limited to the top meter or so of the section. Below this the rocks become darker in colour and harder. This is the same as seen in other trenches.

Devonian Sediments

When excavating, the most definitive Devonian sediment is the red mud flake conglomerate. The individual flakes are seldom more than 5mm in diameter and sometimes are not easy to see. The individual beds are a few centimetres thick although sometimes several beds occur in close proximity giving the impression of much thicker beds. The texture of these sediments is often waxy or soapy, a very characteristic feeling on the trowel. Beds of very similar sediment can be seen in the banks of the Water of Bogie to the east of Tillybrachty, which is on the road between Rhynie and Lumsden. This is mapped by the British Geological Survey as the type section of the Devonian Tillybrachty Sandstone. This material is soft and so would never have survived reworking by any means. These two facts support a confident identification of a Devonian age for this sediment in Trench 14.

Another common sediment occurring in the Devonian section is a hard sandstone or siltstone. Grains are all quartz and fine to very fine grained or silt sized. Mica is sometimes seen but is not common. As explained above this material has been broken up by freeze-thaw processes and so no idea about nature of its bedding can be seen. However sections of the resulting rubble are commonly 200 to 300 mm thick. Upper and lower surfaces are commonly non-planar, but stepped. The relationship between upper and lower surfaces sometimes gives the impression of parallel-sided beds having been offset by small faults, all trace of which have since been obscured by the freeze-thaw.

From its association with the red mudflake conglomerate, this sandstone must be of Devonian age in Trench 14. In other trenches, a very similar material has been called 'made ground' or platform material. The implication is that this material was quarried and deposited to build up the ground level before building the castle. This might be the correct interpretation for the similar material in Trenches 2 and 11, but not for that in Trench 14.

Beds of sandstone were encountered in this trench. These are reddish brown, fine to very fine grained or even silt-sized. They are similar to the sandstone discussed above but have not been brecciated. The reason for the difference is not clear but it might be something connected with its original hardness or porosity. Mudstone rip up clasts seen in sandstones in other trenches have not been seen here.

The sediments about one metre below the top of the Devonian section are distinctly harder and darker than those above. The contact is quite sharp and so defining this point in the section is fairly straightforward. In Trench 14 muddy siltstone is the dominant lithology. It is micaceous and dark grey or grey green in colour. It splits easily along the bedding planes. Individual bedding surfaces cannot be followed far, probably because of small faults as mentioned above and as seen in other trenches.

Glacial Sediments

At the south end of Trench 14 a major glacial channel has cut into the Devonian sediments. The channel is filled with conglomerate made up of clasts of quartzite, quartz or metamorphic and igneous rocks. In the main part of the channel the clast size is up to about 100mm with some much bigger, particularly at the base of the section. At the very south end of the trench a second channel cuts into the main one. This is made up of similar clasts but finer, limited to 20 to 30mm. The clasts in both channels are made up of quartzite and various metamorphic rock types. They are rounded to subangular in shape with a smooth surface.

Basalt Dyke

There is also a basalt dyke that crosses the site from WNW to ESE. It has been seen in the north end of trench 11 and the southern end of trench 14 where it is about 7 metres wide. It has near vertical sides and in Trench 14 local thermal metamorphism was recorded at the contact with the Devonian. It was also seen in trenches 1 and 2 and outcrops to the south of the garden wall east of the castle. It consists of a dark, heavy rock with a fine grain. Fragments that have been weathered often show “onion weathering” - the outside layers peeling away from the inner ones. Magnetite is a common constituent which gives it magnetic properties so that if it is stroked by a strong magnet it will then deflect a compass needle. This has proven to be a very useful test to distinguish even scruffy fragments of this dyke material from other dark rocks of the area.

This dyke forms part of a swarm of similar dykes stretching from Argyle to north-east Scotland. They are of late Carboniferous age with recorded radiometric ages of 302 to 297 Ma (million years). They are often over 10 metres thick and one at Auchinbradie north of Inch is 13 metres wide. From their magnetic properties they have been mapped by geophysical means even when they cannot be seen at the surface. On their new map viewer, the British Geological Survey show this dyke extending westwards to just north of Craig Castle. Elsewhere these dykes have been mapped over considerable distances: the Lochgoilhead dyke can be followed 100 kms eastwards to Perth and another from near Rhynie, 65 kms to Boddam near Peterhead. They represent a period when the earth's crust was under north south tension and magma welled up the resulting cracks from very deep underground.

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