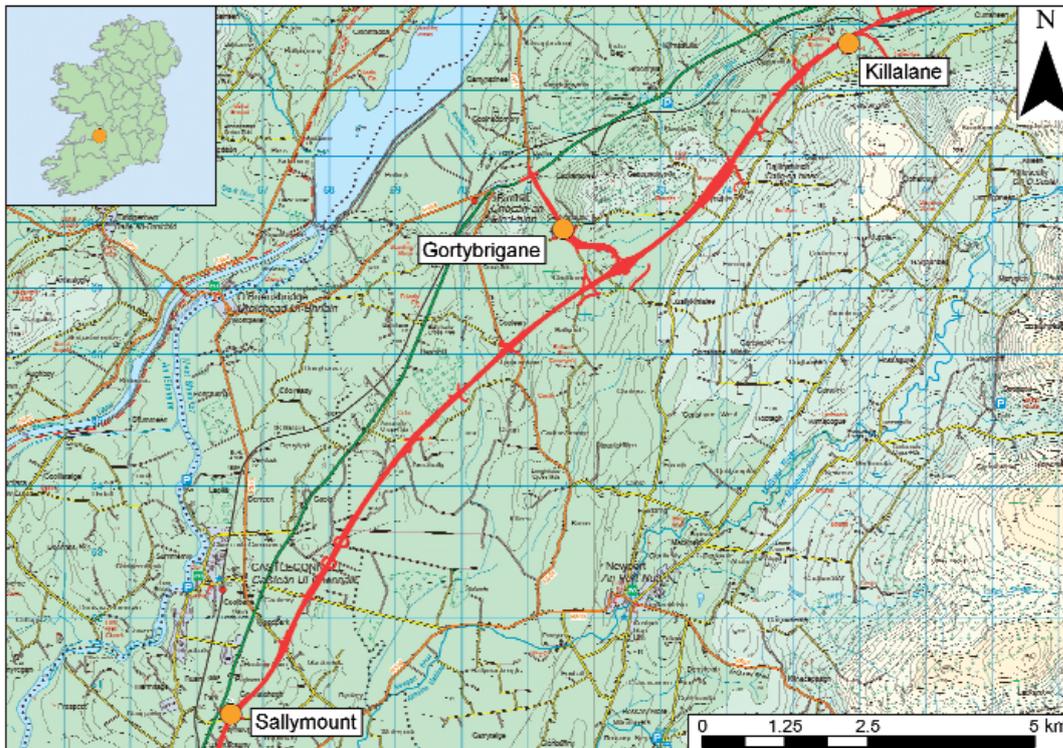


3. Food for thought: newly discovered cereal-drying kilns from the south-west midlands

Patricia Long



Illus. 1—Location of the sites at Gortybrigane and Killalane, Co. Tipperary, and Sallymount, Co. Limerick (based on the Ordnance Survey Ireland map).

Until recently the number of cereal-drying kilns known in Munster and Leinster was relatively low compared to the numbers known in northern Connacht and western Ulster (e.g. Johnston 2003; Monk & Kelleher 2005), but recent discoveries in advance of large infrastructural projects appear to have redressed this balance. It now seems that cereal-drying kilns were a common agricultural feature throughout the country, and the discovery of at least 21 such kilns along the route of the N7 Nenagh–Limerick High Quality Dual Carriageway is clear evidence that the south-west midlands were no exception. This paper will focus on seven of these kilns from four individual excavations directed by the author in the townlands of Sallymount, Co. Limerick, and Killalane and Gortybrigane, Co. Tipperary (Illus. 1). These excavations were conducted by Headland Archaeology Ltd on behalf of Limerick County Council in conjunction with North Tipperary County Council and the NRA. Although post-excavation analysis is still at a preliminary stage, the discovery of a variety of kiln types in a localised area has provided a valuable opportunity to examine the characteristics of cereal-drying kilns in this part of the country.

Cereal-drying kilns are generally classified according to their shape in plan (Monk & Kelleher 2005, 79). The categories of kiln are keyhole-shaped, L-shaped, figure-of-eight-shaped, dumb-bell-shaped and irregular (*ibid.*). Though these kilns varied in size and shape,

they all functioned by directing heat from a fire, via a channel (or flue), to a drying chamber that would have contained the cereal. The crop would have been raised off the ground, on a timber drying floor for example, to allow the heat to permeate up through it. Interestingly, among the seven kilns under discussion here three different types were represented. Details of these kilns are summarised in Table 1.

Owing to the damp climate in Ireland cereal-drying kilns would have been an essential element in crop-processing (Kelly 2000, 241). Kilns were used to dry and ripen the harvest in wet years. Drying the cereal also facilitated processing, as the crop became brittle and the chaff was more easily removed; dry, brittle grain is also more suitable for milling (van der Veen 1989, 308). Lowering the moisture content of the grain made it less vulnerable to mould and fungus and prepared it for storage over the winter months, and the heat involved in the drying process had the added benefit of fumigating the crop of pests. Cereal-drying kilns were also used to kill off the shoots of germinating grains in the malting process (Johnston 2003, 3).

Table 1—Summary of the seven kilns within the study group.

Site	Kiln type	Orientation	Dimensions	Plant remains identified during preliminary assessment	Calibrated radiocarbon dates (2 sigma)
Killalane ringfort	Figure-of-eight	E–W	2.45 m long, up to 1 m wide and 0.3 m deep	Hulled barley as well as small amounts of rye	AD 654–768 (UBA-9931)
Gortybrigane enclosure	Dumb-bell	NW–SE	2.5 m long, up to 1.32 m wide and bowl 0.3 m deep	Hulled barley	AD 408–536 (UBA-9937)
Gortybrigane enclosure	Dumb-bell	NW–SE	2.5 m long, up to 1 m wide and 0.32 deep (in bowl)	Hulled barley	AD 430–570 (UBA-9936)
Gortybrigane enclosure	Keyhole (unlined)	NE–SW	2.29 m long, up to 1.33 m wide and 0.46 m deep (in bowl)	Hulled barley and oat	AD 542–633 (UBA-9938)
Sallymount enclosure	Dumb-bell	N–S	3.64 m long, 0.9–1.24 m wide and 0.68 m deep	Oat, hulled barley and possibly some rye	AD 653–770 (UBA-9935)
Sallymount enclosure	Dumb-bell	E–W	2.62 m long, 0.64–0.98 m wide and 0.46 m and 0.56 m in depth	Oat, hulled barley and possibly some rye	AD 688–870 (UBA-9934)
Killalane isolated kiln	Keyhole (stone-lined)	NNE–SSW	4.4 m long (including 2.9-m-long flue), 2.5 m wide and 0.36 m deep (in bowl)	No grain identified in preliminary assessment	AD 1688–1954 (UBA-9928)

The sites

Six of the seven kilns under discussion were found in association with three substantial ditched enclosures. On these sites it seemed that cereal-drying was taking place in a designated area within the settlement, slightly removed from dwellings and other industrial processes such as metalworking. Initial analysis would suggest that all three enclosures are early medieval in date but each was very different in character.

Enclosure at Killalane, Co. Tipperary

A figure-of-eight-shaped kiln was identified between the ditches of a bivallate enclosure at Killalane, Co. Tipperary.¹ Only that portion of the enclosure within the road corridor was excavated (Illus. 2). The south-west-facing entrance was flanked by two large post-holes that probably supported a gate structure. Initial interpretation of the site is that it was a bivallate ringfort. Inside the enclosure, evidence for a building and a large pit of uncertain function was identified. A whetstone and part of a rotary quern were the only artefacts recovered during the excavation. The rotary quern provides evidence that milling of grain was also taking place on the site.

The only feature identified between the two ditches was the figure-of-eight-shaped kiln (Illus. 3). One side of the kiln was disturbed by a modern drain but the western side remained intact. It is generally accepted that identifiable cereal-drying kilns consist of three components: a firing area (or firespot), a flue and a bowl/drying chamber (Monk & Kelleher 2005). The modern disturbance, however, made it difficult to identify these



Illus. 2—Elevated view of the bivallate ringfort at Killalane, Co. Tipperary, looking north (AirShots Ltd).



Illus. 3—Figure-of-eight-shaped kiln at Killalane (shaded to indicate its extent), with the remains of a possible clay roof around the edge of the drying chamber. The kiln had been truncated by a modern drain (Headland Archaeology Ltd).

elements in this particular kiln. A ring of clay around the western edge of the kiln may represent the remains of a clay roof over the drying chamber. The location of the kiln would have been slightly removed from the activity inside the enclosure and it may have been cut into the outer bank, which would have afforded it shelter and protection. There is, however, no stratigraphic evidence to support this idea and further dating analysis of the outer ditch is necessary in order to confirm contemporaneity with the kiln.

Enclosure at Gortybrigane, Co. Tipperary

Three cereal-drying kilns were identified within a large enclosure at Gortybrigane, Co. Tipperary.² Only part of this enclosure was excavated but a geophysical survey of the area beyond the road corridor indicated that it was subcircular in shape (Illus. 4). An unusual entrance was located on the north-east side, which had been modified during the enclosure's period of use. The geophysical survey indicated a possible second entrance on the south-west side.

Although the site had suffered severely from plough damage in the recent past, a large number of features were identified within the enclosure, including two structures (Illus. 5).



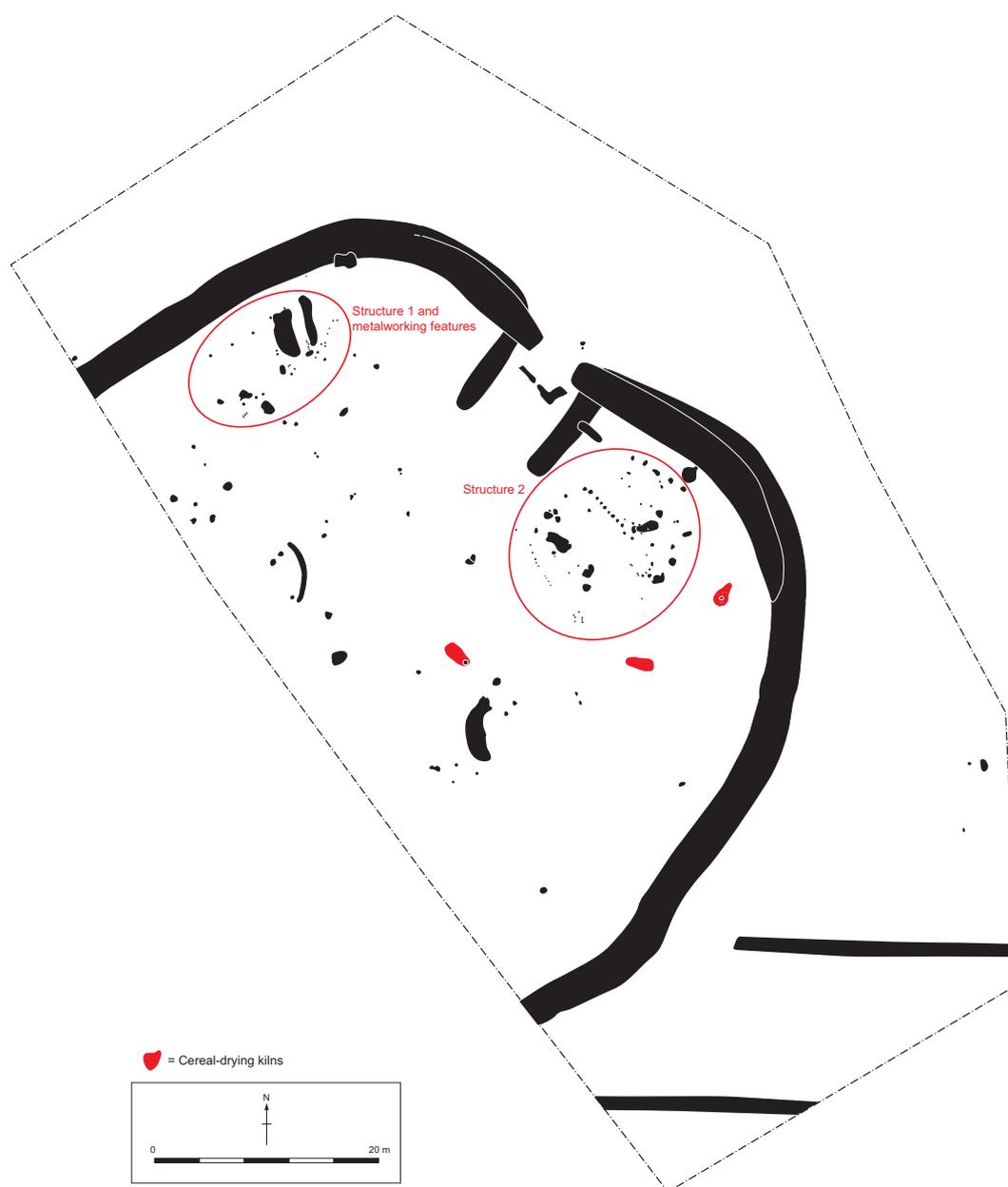
Illus. 4—Aerial view of the enclosure at Gortybrigane, Co. Tipperary, looking north-east, with a greyscale image of the geophysical survey results from the adjacent field (Markus Casey/Target Geophysics Ltd).

A number of features associated with metalworking were found in the north-west quadrant of the enclosure, while the three kilns were located in the south-east quadrant. This arrangement might suggest that the industrial processes of metalworking and cereal-drying were carried out within separate designated areas.

Two kiln types were represented at Gortybrigane: dumb-bell- and keyhole-shaped. Two dumb-bell-shaped kilns were identified and consisted of a depression at either end linked by a flue. The larger, more rounded of the depressions have been interpreted as the drying chambers.

Within the keyhole-shaped kiln, the circular south-western part of the feature has been interpreted as the drying chamber. Seven stake-holes identified at the base of the chamber would have supported a drying platform or superstructure, which is known to have existed in many keyhole-shaped kilns (Knox 1907). A subrectangular extension to the circular chamber would have served as the flue, though it was less than 0.9 m long. The base of the chamber was heavily oxidised, suggesting that high-temperature burning had taken place within it. A fire in the drying chamber would not have been the result of the cereal-drying process. The short length of the flue could have been the cause of an accidental fire. Experiments have shown that a spark from the firespot could easily have reached the bowl if the flue was short (Monk & Kelleher 2005).

A rotary quern base and two rotary quern fragments recovered on this site indicate that the milling of cereal was also taking place here.

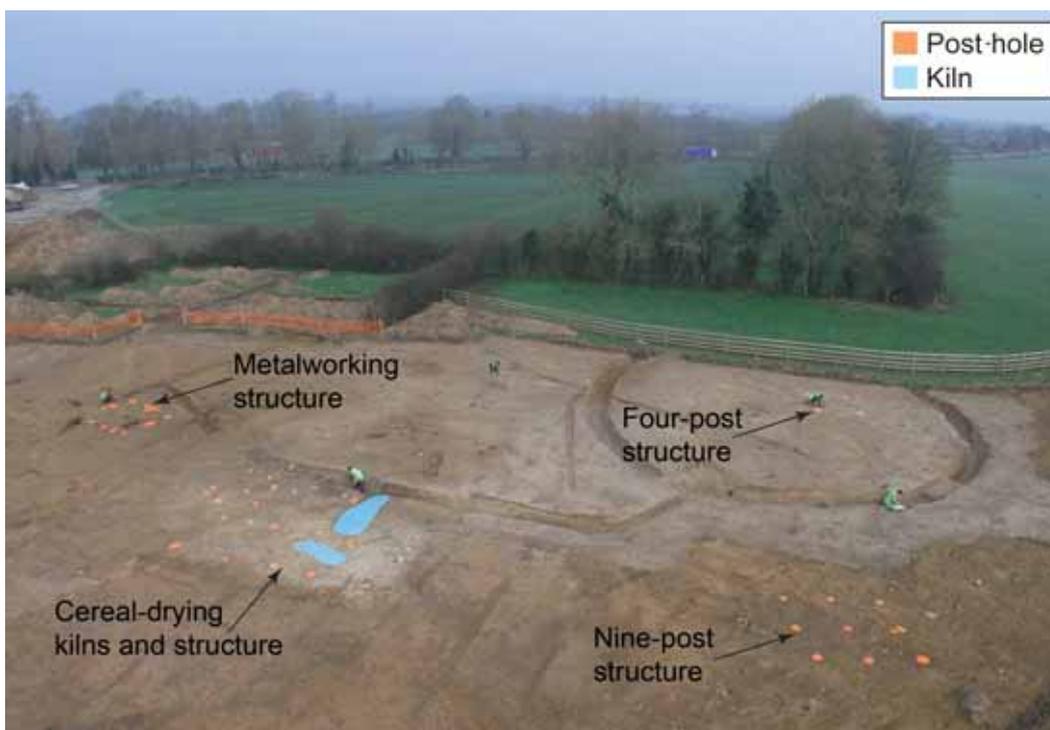


Illus. 5—Plan of the excavated features at Gortybrigane, highlighting the location of the cereal-drying kilns (Headland Archaeology Ltd).

Enclosure at Sallymount, Co. Limerick

Two dumb-bell-shaped kilns were identified within a structure in close proximity to a multi-phase enclosure site at Sallymount, Co. Limerick.³ The main part of the enclosure was roughly circular in shape, with a small number of internal features, including a four-post structure of uncertain function. A subrectangular extension was added to the west of the enclosure and a number of features were also identified within this.

Three well-defined structures were located immediately south of the enclosure ditches (Illus. 6). The most westerly of these was rectangular with a central bowl furnace and large



Illus. 6—Aerial view of the enclosure at Sallymount, Co. Limerick, with structures and cereal-drying kilns highlighted (AirShots Ltd/Headland Archaeology Ltd).

amounts of metalworking waste deposited nearby. A regular nine-post structure was identified in the east of the site but there was no evidence as to the function of this building.

The third structure, located just outside the ditches of the subrectangular enclosure, seemed to have been designated for cereal-processing. Two kilns, positioned at a right angle to each other, were located at the east side of the building, which is likely to have been open-ended. A row of posts between the two kilns may represent a dividing wall within the structure. It is not yet clear whether this division served a particular function, such as the separation of grain types. The floor space within the structure to the west of the kilns could have been used for further processing, such as threshing or milling. Alternatively, it may have been used for grain storage, as has been suggested for structures associated with kilns at Rathbane South, Co. Limerick, and Haynestown, Co. Louth (Monk & Kelleher 2005, 84), even though this may only have been during seasons when the kilns were not in use owing to the risk of fire. Medieval texts indicate that grain was stored in a barn (*saball*) (Kelly 2000, 243), but clear evidence of such structures on archaeological sites is difficult to find. Light structures such as roof supports, screens or windbreaks have been identified on several sites (Monk & Kelleher 2005, 84), but the rectangular building surrounding the kilns at Sallymount was more substantial in nature. It is also possible that the nine-post structure to the east of the kilns and the four-post structure within the enclosure may have been grain stores, though there was no environmental evidence to support this. Similar four-post arrangements have been excavated elsewhere and interpreted as the foundations of grain silos (e.g. Gent 1983, 254).

Stone-lined kiln at Killalane, Co. Tipperary

The seventh kiln within the study group was found in relative isolation. It was a stone-lined, keyhole-shaped kiln that had been cut into a prehistoric burnt mound at Killalane.⁴ It may have been sited here deliberately, as the mound would have appeared as a raised dry area in a generally wet field. It is possible that the kiln was related to a post-medieval farmstead that was excavated 200 m to the north, also in the townland of Killalane.⁵

A maximum of four courses of stone walling survived in the drying chamber, and the capstones on the flue had been displaced (Illus. 7). A rake-out deposit was located down-slope of the firespot, and this kiln also featured a stone baffle (barrier) that remained *in situ* between the flue and the drying chamber. The baffle would have prevented sparks from the fire from reaching the cereal in the chamber.



Illus. 7—Stone-lined cereal-drying kiln at Killalane during excavation (Headland Archaeology Ltd).

Dating and chronology

Monk and Kelleher (2005) have postulated that figure-of-eight- and dumb-bell-shaped kilns may have been the forerunners of keyhole-shaped kilns in Ireland. The seven kilns under discussion here have been radiocarbon-dated in an effort to contribute to the existing evidence of cereal-drying kiln chronology.

From the radiocarbon dates (Table 1) it seems that the earliest kilns within the study group were the two dumb-bell-shaped kilns in the Gortybrigane enclosure. Charred cereal grains from secure contexts within the kilns were dated, and these placed the kilns at the beginning of the early medieval period. Interestingly, the keyhole-shaped kiln within the

same enclosure returned a slightly later date of AD 542–633 (UBA-9938; see Appendix 1 for details). The occurrence of two types of kiln within the same enclosure is significant and could be seen as direct evidence of kiln development. The figure-of-eight-shaped kiln at Killalane, however, post-dated the keyhole-shaped kiln at Gortybrigane, with a date of AD 654–768 (UBA-9931). The dumb-bell-shaped kilns in Sallymount, which were roughly contemporary with each other, had a similar date range.

The stone-lined, keyhole-shaped kiln at Killalane was considerably later than the other six kilns. It had a broad date range, though it is most likely to date from the 19th century. This date would generally be in keeping with other excavated keyhole-shaped kilns, which tend to date from the later and post-medieval periods (*ibid.*, 105).

Although there is more post-excavation work to be done in relation to the dating of these kilns, the evidence so far would support the idea that the stone-lined keyhole-shaped kiln superseded figure-of-eight- and dumb-bell-shaped kilns. This is likely to have been a gradual process, and basic unlined keyhole-shaped kilns, such as that at Gortybrigane, may have been in use in parallel with older kiln types for a time, possibly indicating indigenous development of the keyhole-shaped kiln. The emergence of a preference for the keyhole-shaped kiln suggests that it was seen as the most efficient of the three types.

The plant remains

The preservation of plant remains on all four sites was poor, but preliminary assessment of charred grains by archaeobotanist Karen Stewart has given an indication of which crops were being processed in the kilns. Barley is the only crop so far identified from the early kilns at Gortybrigane. The later kiln on this site also had evidence for barley as well as oats.

The identifiable remains from the Sallymount kilns and the figure-of-eight-shaped kiln at Killalane were dominated by oats, with small amounts of barley. Evidence of rye and hazelnut shells was also present in very small amounts. In advance of charcoal identification, it is unclear whether the presence of hazelnuts was due to their use as a foodstuff or whether they were introduced through the use of hazel wood as fuel. It should be noted that a significant proportion of grains were unidentifiable during the assessment, but further analysis may provide more information. The plant remains from the stone-lined kiln at Killalane are currently undergoing analysis.

Overall, the evidence from these kilns suggests a dominance of barley in the three earliest kilns, while oat was dominant in the three slightly later kilns and there was no evidence of wheat.

Excavated cereal-drying kilns generally have a high incidence of oats, followed by barley and then wheat (Monk & Kelleher 2005, 85). Within the study group oats and barley also seem to have been prevalent in the kilns, although more analysis is required in order to comment further on the significance of the plant remains from these sites.

Conclusion

Cereal-drying kilns were a vital element in agricultural food production in Ireland's damp climate. Preliminary analysis of seven kilns on the route of the N7 Nenagh–Limerick road

scheme has shown that the number and variety of kilns discovered in that area have the potential to contribute to our knowledge of kiln chronology and use on both a regional and national level.

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Notes

1. Killalane enclosure: NGR 175839, 170715; height 73.47 m OD; excavation reg. no. E2495; ministerial direction no. A026.
2. Gortybrigane enclosure: NGR 171530, 167895; height 79.61 m OD; excavation reg. no. E2488; ministerial direction no. A026.
3. Sallymount enclosure: NGR 166520, 160525; height 38.95 m OD; excavation reg. no. E3420; ministerial direction no. A026.
4. Killalane kiln: NGR 175921, 170740; height 66.75 m OD; excavation reg. no. E2495; ministerial direction no. A026.
5. Killalane farmstead: NGR 175866, 170819; height 69.99 m OD; excavation reg. no. E2495; ministerial direction no. A026.