Cambridge Archaeology Field Group

Field walking and field drain finds

A discussion of their history and

typical finds from field walking

Field walking and field drains.

Our field walking efforts produce finds representing many different types of material and covering a wide range of periods. We may find prehistoric struck and burnt flint or pottery from the Iron Age to the present day. There may be bricks and tiles from the Roman period onwards or glass from windows and vessels of many sorts.

A category of finds that we do not keep, but are common on the clay lands of Cambridgeshire, would be parts of field drains, like those shown in Figbure 1.. These ceramic pipes, when broken, may often be confused with being domestic pottery. In addition there seem to be no publications that discuss these finds and their dating. So is it possible to date these finds? Firstly, then, we need to understand some of the history of field drains and their use.

Figure1. A selection of field drains from an excavation at Lamp Hill, Wimpole (Photograph courtesy of Mike Coles).

Field drainage in Britain probably started in Roman times, but it is only in the last 250 years that significant amounts of field drainage has been undertaken. In the 17th C the start of the enclosure of the common lands was an important step leading to increased efficiency of farming. From about 1750 this led to the increased use of drainage in order to improve land suitability for agriculture. Early drains were mainly made of gravel, stones or brush wood placed in shallow trenches. We see something similar to this at Wimpole where we have uncovered early drains that are simply trenches filled with brick fragments. It was only from the beginning of the 19th C and the common availability of ceramic clay drain pipes that their use became more widespread. The manufacture of these drain pipes was mostly a matter for local brickyards or brick makers employed by the larger estates, like Wimpole. As a result changes and improvements to the drains took place at the local level rather than some nationally

organised manufacture. In 1784 a tax was imposed on bricks and other building materials, which included ceramic field drains, and this was only removed from these drainpipes in 1826 after a campaign of protests. The field drains were exempted from tax provided they had the word ‘DRAIN’ impressed on their surface but eventually in 1850 the tax was abolished altogether and the need for the impressed word disappeared. This period provides a possible dating method as drain pipes with DRAIN impressed on them probably date from 1826 to 1850.

In I845 Thomas Scragg invented a machine for cheaply extruding drainage pipes, which brought their price down by about 70%, and began a period of extensive drainage activity which continued for the next 50 years. Agricultural field drainage at the end of the 19th C was estimated to be present on around 12 million acres of land. The Ministry of Agriculture, Fisheries and Food (MAFF as it was known in the 1950’s) carried out a survey of the drainage installed in agriculture prior to 1940 and figure 2 shows their summary of the amount of drainage in England and Wales (Robinson, 1986).

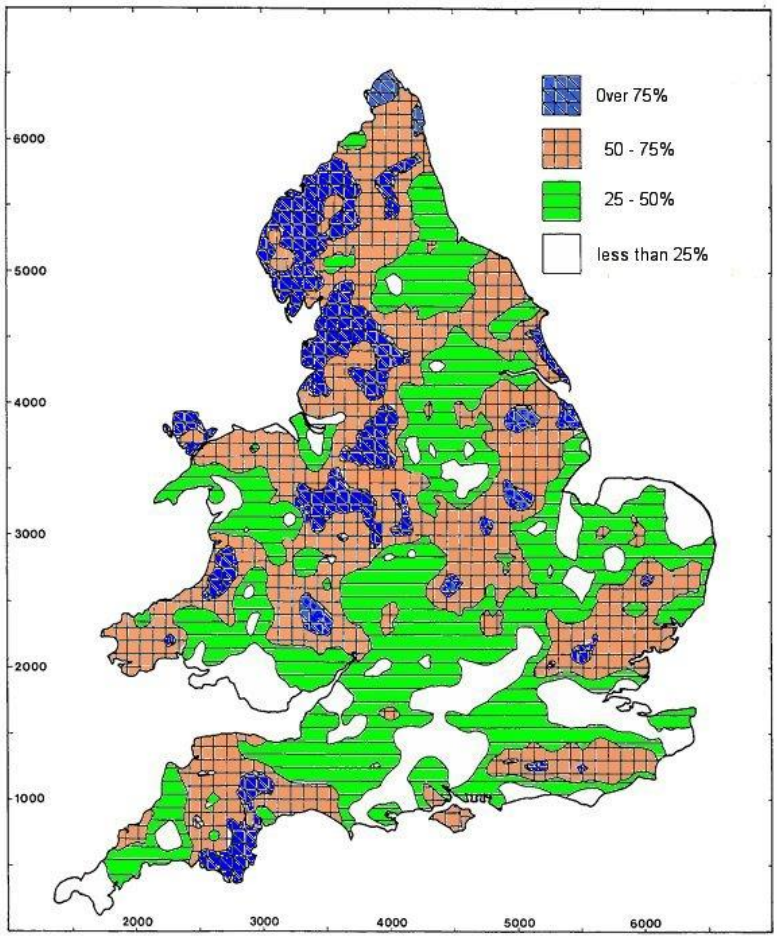


Figure 2. Percentage of agricultural land in England and Wales found to contain field drains installed prior to 1939

The pattern of drainage use shows, as expected, a general agreement with the pattern of the local soils ability to handle volumes of water. Areas with few drain installations can be readily correlated with areas of permeable soils having good natural drainage (e.g. the Downs, Cotswolds and Chilterns in southern England and the Yorkshire Wolds in northern England). Higher rates of drain installation occur in areas with more impermeable soils such as the clay soils of Essex, Cambridgeshire, Suffolk and Lincolnshire, and the Weald in Surrey and Sussex. Figure 3 shows a very familiar picture of a waterlogged Cambridgeshire field in Spring.

Figure 3. Waterlogged field in Cambridgeshire during Spring (Authors photograph).

The highest rates lie in the north and west; these are high rainfall areas associated with low permeability soils. The MAFF conclusion was “it is rare to find a field which has not been drained at some time or another; and much of the work being carried out today consists of reconditioning or replacing old systems”.

As part of their work with farmers since 1940 MAFF recovered a large number of old drainage pipes from all over the country which they formed into a collection. This was donated to the Museum of English Rural Life at Reading University along with an original catalogue of the collection. This is the basis of the illustrations shown in Appendix 1. The examples show the development of the drain from its original open

trench via various open horse-shoe shaped ceramic designs that were then replaced by various closed, flat bottomed pipes formed by extrusion. Finally these became the basically circular drain we most often find today. It is usually made with a porous terracotta type material and sometimes with a corrugated outer surface.

The drains we find are normally broken fragments so that it is usually impossible to say what the exact design was, although extrusion marks are usually quite obvious as seen in Figure 4.

This photograph shows a section of modern circular ceramic drain with the longitudinal extrusion marks clearly visible.

Figure 4. Section of ceramic drain pipe with extrusion lines visible (Authors photograph).

Modern day drainage

Some contractors still instal ceramic drains manually in excavated trenches, as shown in the left hand photograph in Figure 5 below.

Figure 5. Modern drain installation (Knowlesdrainage.co.uk)

However, the most likely form of drainage today will be plastic pipe of varying diameters laid mechanically as shown in right hand photograph in Figure 5 above. However, with the effects of climate change forecast to increase the amount of rain falling, scenes like the one below may become more common as more drainage is required to keep field flooding under control.

Figure 6. Field runoff in the wet spring of 2024 (Authors photograph).

Conclusions

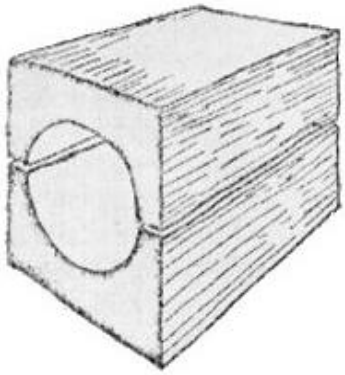
It is more or less impossible to date the ceramic field drain fragments we find during our field walking. The fragmentary nature of the finds also means it is difficult to suggest which form they originally took. Extrusion marks help by providing a terminus post quem (i.e. after 1845) because before then they were hand-made. These issues will change even more as plastic piping replaces the ceramic originals and makes dating even more difficult.

tcd 2024

Appendix 1.

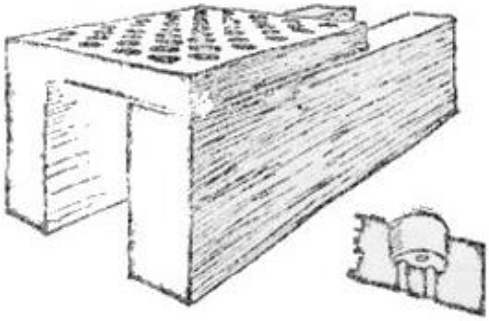
Catalogue of old field tiles and drains, MAFF Land drainage & Water supplies division, 1959. (MERL Library Pamphlet – 4050-Box-1/30)

1



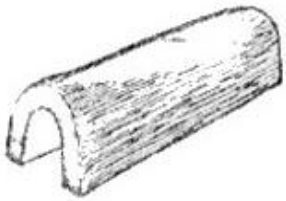
This drain brick is an early form of channel used either singly or as a pair. The outside dimensions of a single brick are: Length 10.5", width 6", depth 3.25". The inside has a 2" radius.
From Essex.

2



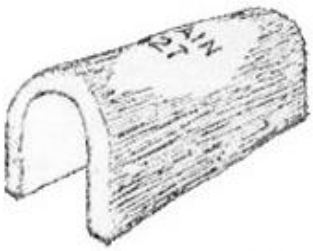
This drain was probably used inside a stone filled trench. The side members are 18" long, 4.5" deep and 2" wide. The uppewr slab is 11" long, 7.25" wide and 1" thick. The perforations are circular holes 1.12" diameter and pentrate 0.5" halfway through the slab.
From Essex.

3



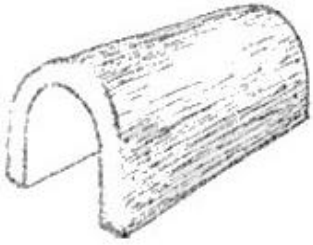
A small size plain horse-shoe drain, 12.25" long, 2.5" overall height , 2.12" width at the bottom. Thickness is 0.6".
From Nottingham.

4



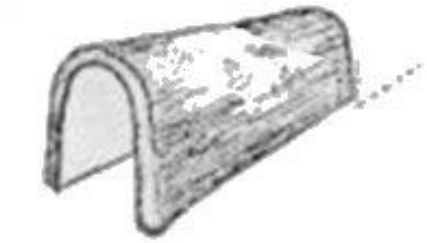
An interesting example of a plain horse-shoe drain with the word DRAIN and the date 1827 indented. The length is 12", overall depth 4", width across bottom 4" and slab thickness 0.6".
Origin unknown.

5



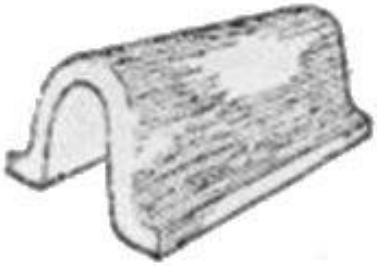
Another example of a plain horse-shoe drain. Reputedly 100 years old. Length 11", overall height 4", width 4.5" and thickness 0.5".
From Worcester.

6



A tapered horse-shoe drain designed so the joints could overlap. The tile is 9" long, the larger end is 3.75" overall height and 3.75" across the bottom.The smaller end is 3" high and 2.5" across the bottom. Slab thickness is 0.65". From East Sussex.

7



A development of a plain horse-shoe tile to prevent the tile sinking in the soft bottom of the trench. Length 10", overall height 4", overall width 5.5", inside width 2.5" and slab thickness 0.65".
From Nottingham.

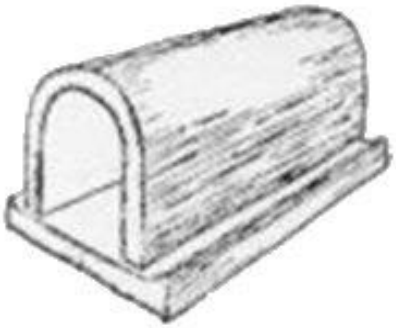
8

Another example of forming a broad base to a
horse-shoe tile. Length 9", outside height 4.3"
and width 3.25".Inside height 3.8", maximum
width 2.25".
Origin unknown.

9

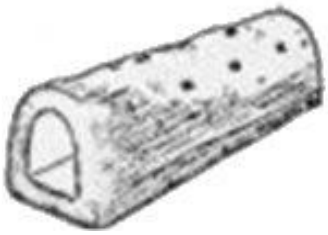
An example of a horse-shoe tile on a flat base. Length 12". Overall height 3.5", 5.5" overall width and slab thickness is 0.65". The base is 6.5" wide and 0.75" thick.
From Nottingham.

10



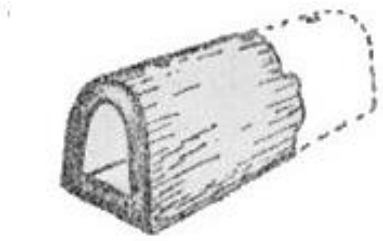
A horse-shoe tile with a specially made base. The length is 12.75". Tile height is 4.25" overall, 4.25" wide overall and 0.65" thick. The slab is 5.75" wide and 0.75" thick.
From Nottingham.

11



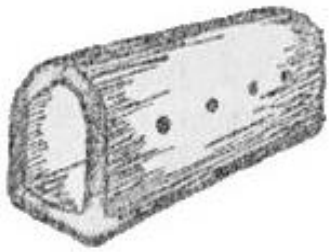
An example of a flat slab bent before firing to
form a D-shaped tile. Holes 0.5" square are punched in the upper surface. Length 12", outside height and width each 3.25". Inside height and width 2".
From the London Brick Co Ltd.

12



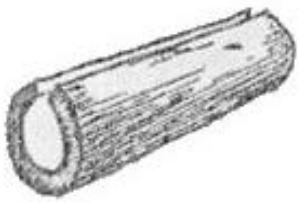
A D-shaped pipe made from a horse-shoe tile with a flat slab clayed to the inside of the the bottom. Pipe has holers along the top. Example broken but probably 12" long. Outside height is 3.25" and width 3". Thickness 0.6" Origin unknown

13



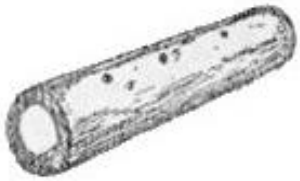
An extruded D-shaped pipe with holes punched along the side. Length 11.9". Overall height 4".and width 3.25". Thickness 0.5".
Origin unknown

14



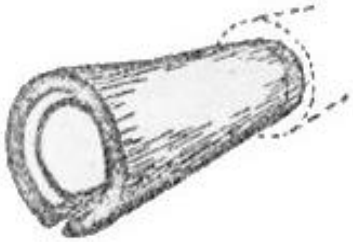
A circular tile formed from a flat sheet, with 4 holes punched in it. Word DRAIN indented. Length 11", outside diameter 2.75", inside diameter 1.25".
From East Sussex.

15



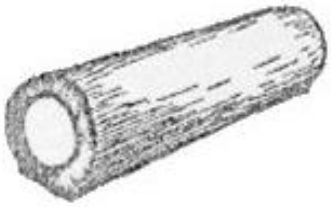
A circular pipe made from 2 semi-circular slabs clayed together. Two rows of holes diametrically opposed. Length 12". Outside
diameter 2.12", inside diameter 1.25"
From Yorkshire.

16



A tapered circular tile made from a flat slab. Forms a spigot and asnd socket drain.
Length 10.75", socket 4" outside diameter
and 2.75" inside diameter. Spigot 2.6" outside and 1.8" inside diameters.
From East Sussex.

17

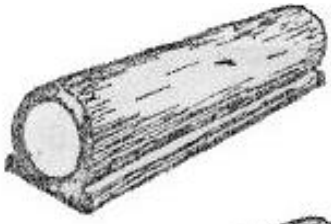


A extruded pipe with flat base. Length 12.75", outside 2.75" high and 3" wide. Inside 1.75" high and 2" wide. Flat base 1.75" wide.
Origin unknown.

18

A extruded pipe with flat base. Length 13", outside diameter 2.1" Inside diameter 1.6" and flat base 2.12" wide.
Origin unknown.

19

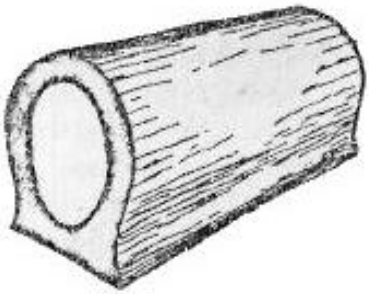


A similar pipe to No 18 but slightly larger. Length 12.75", outside diameter 2.75" and
inside diameter 1.75". Base width 2.75". Origin unknown.

20

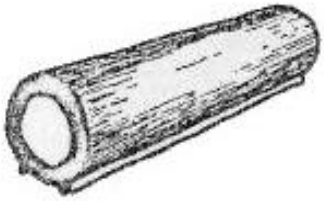
Another pattern of extruded pipe with circular opening and flat base. Length 12.5". Outside height and width 3". Inside diameter 12.75".
From Nottingham.

21



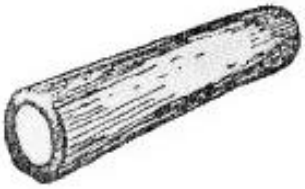
A further pattern of extruded pipe with flat base. Length 12.75", outside height 5" and width 4.5". Inside height 3.75" and width 3.25". Base width 4".
From Nottingham.

22



A circular pipe with ribs instead of a flat base. Length 12.1", outside diameter 2.75",
inside diameter 1.75".
From Nottingham.

23

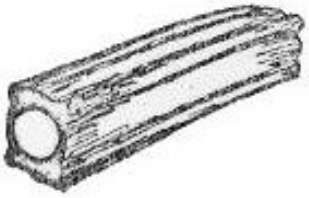


A circular pipe with flat base. Length 12.6",
outside diameter 2.25", inside diameter 1.5". Base width 1".
From Nottingham.

24

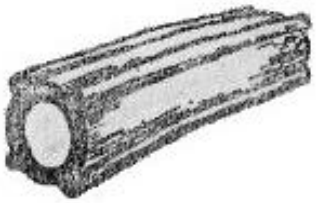
A "pencil" pipe, so called because of its small diameter, this one has a flat base. Length 12", outside diameter 1.6", inside diameter 1.1". Base width 0.75".
Origin unknown.

25



A circular bore with a square outside shape. Length 13", outside 2.25" x 2.25", inside 1.25" vertically, 1.4" horizontally.
Origin unknown.

26

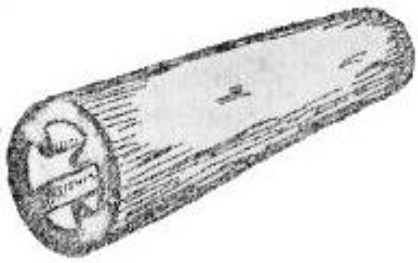


A further example of a square pipe with circular bore. Length 12", outside 3.75" x 2.75", inside diameter 1.75"
Origin unknown

27

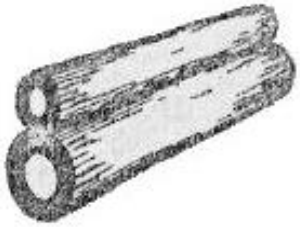
Ingenious D-section pipe (broken and indecipherable lettering. Date thought to be 1848. Length about 10", outside height 2.4" and width 2.6". Inside height 1.25" and width 1".
From Leicester.

28



Circular pipe with 4 longitudinal ribs in inside forming a cross shape. Thought to have been a Telford design. Broken example probably 24" long. Outside diameter 3.8" and inside 2.6". Ribs protrude 0.75" and are 0.6" wide.
From Holkham, Norfolk.

29



A double bored pipe in the shape of a figure 8. Length 11.75". Larger bore has outside diameter 2.25" and inside diameter 1.25". Small bore is 1.5" and 0.75" respectively.
From Hertfordshire

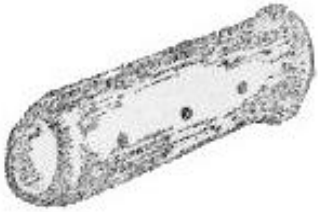
30

Circular spigot and socket pipe formed on a potter's wheel. Length 6", outside diameter 3.75", inside diameter 3".
From Derby.

31

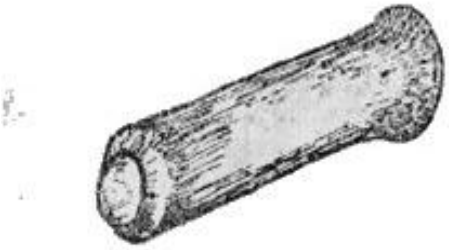
Example of "collar" pipe drain which has a short length of larger diameter pipe to form a collar over the joints. Pipes about 12" long, outside diameter 2.25", inside diameter 1.5". Collar 3" long.
Origin unknown.

32



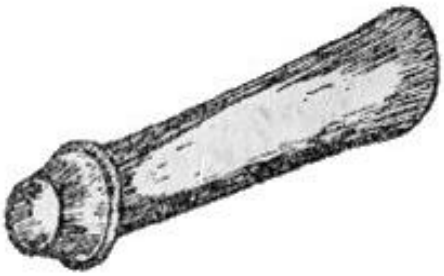
Example of a spigot and socket pipe with one end enlarged to form the socket. Two rows of holes diametrically opposed.
Length 12.75", outside diameter 2.75" and inside diameter 1.75".
Origin unknown

33



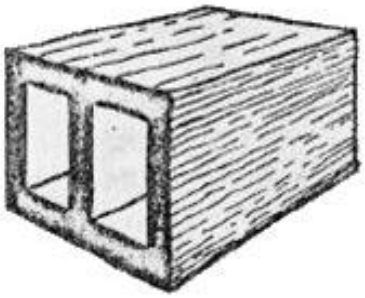
Another example of a spigot and socket drain but without holes. Length 18", outside diameter 3.12", inside diameter 2".
Origin unknown.

34



A tapered spigot and socket pipe. Length 19". Small end diameter 2.75" outside and 1.8" inside. Large end diameters 3.75" and 2.8" respectively.
From Hertfordshire.

35



A clayware hollow partition block used as a drain. Length 10", outside width 6", outside depth 4.5", thickness 0.75".
Origin unknown.

36

A pipe with gothic arch top and flat base, used in peat soils. Length 12.75", outside heigth 4", outside width 2.5".Bore 2.75" high and 1.5" wide.
From Lancashire.

References

Robinson, M. (1986), The Extent of Farm Underdrainage in England and Wales prior to 1939, *Agricultural History Review,* Volume 34, Part 1, p83.

A good reference web article is:

www.scottishbrickhistory/evolution-of-the-land-drainage-tile