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The Linear Earthworks of Cornwall: What if They Were Early Medieval?

Erik Grigg

This article examines various linear earthworks in Cornwall that may date to the early medieval period. The dating evidence for the earthworks is discussed. While incontrovertible evidence for when they were built is lacking, the article asks how they might fit into the early medieval period if that is when most or all of them were built. The article postulates that they may have provided refuges against raiding, probably from the kingdom of Wessex in the eighth and ninth century, so allowing the Cornish to preserve their distinctive identity and language until the modern era (Padel 2017).

Keywords: Cornwall, dykes, warfare, dating, identity

Introduction

Across Britain, there are at least a hundred linear earthworks (or as they are often more simply called: dykes), many probably dating from the early medieval period (specifically c. AD 400–850), the best known of which are Offa's Dyke and Wansdyke. That turbulent period saw the rise of new kingdoms as Roman Britain was replaced by a mosaic of small polities. Few are mentioned in historical sources, so the challenge is to ascertain when and why these dykes were built. Researchers continue to disagree about the function of these dykes and accurately dating them is difficult even with modern archaeological techniques. This study will examine some undated earthworks in Cornwall and postulates that these earthworks were of early medieval date and had a common function as defences against raiding. Cornwall is unique in being the only place in England where a Brythonic language survived until modern times (see Grigg 2008a). In this regard, might the dykes have some bearing on the emergence of Cornish identity through various iterations to its modern renaissance and the UK government recognising the Cornish as a national minority in 2014 (Grigg 2008b, 2018: 126–127)?

Possible original functions of dykes in early medieval Britain

Before considering the Cornish earthworks, it is necessary to outline the various reasons why dykes might have been built in the early medieval period in Britain more broadly. Some writers have claimed that early dykes were designed to control trade (e.g. Malim 2007), others argue they were amicably agreed frontier markers between kingdoms (Fox 1955: 279–281) while some have postulated a military role where in times of danger beacons or horns summoned local levies to defend the dykes (Burne 1959: 126–128; Hill and Worthington 2003; Grigg 2018). One writer claimed an earthwork in Yorkshire,

Roman Rig, was the remains of a roadway, and though other writers were dismissive of this theory, it might be worth testing (Ferns 1980; Boldrini 1999: 28–29; Cronk 2004: 8–9). Earthworks have been used to delimit spaces for religious or ritual reasons like the banks of Neolithic henges or medieval Christian sites. In the past, many individual dykes postulated as early medieval have been interpreted as barriers constructed by the Britons to fend off Anglo-Saxon attack or vice versa. The longest monument, Offa's Dyke, is still widely considered to mark an Anglo-Welsh divide by the public (Bapty 2007). In recent years, historians have begun to question such simplistic divisions of people into Angles, Saxon, Jutes and Britons (e.g. Lucy and Reynolds 2002: 10). Yet, if such ethnic identities were not inherent but created, perhaps dykes actually defined the newly emerging kingdoms helping to form a sense of a distinct identity (Hamerow 2002: 100; Reynolds and Langlands 2006). It could also be that the military appearance of the dykes was largely symbolic with the spectacle of building a huge earthwork serving as a political device to reinforce royal power (Fox 1955; Squatriti 2002). This range of interleaving functions must be kept in mind when interpreting linear earthworks which might have been constructed in early medieval Cornwall.

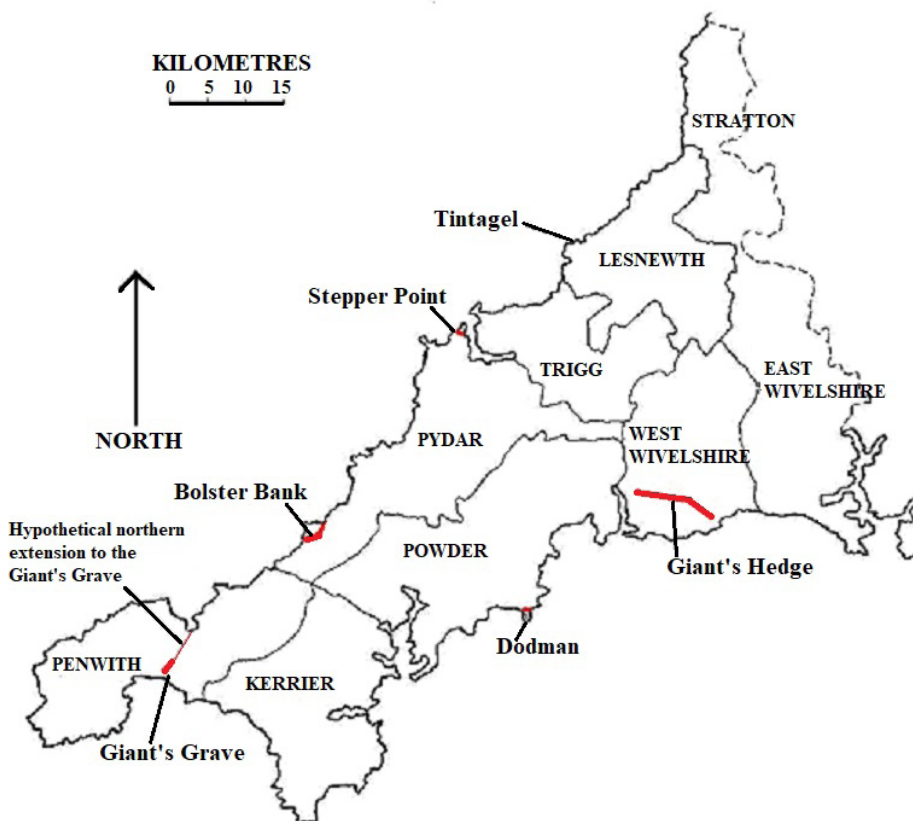


Figure 1: Map showing the location of the dykes in comparison with the Hundred boundaries of Cornwall

The Cornish dykes

My doctoral research surveying early medieval dykes across Britain identified five candidates for Cornwall (Grigg 2015, see also 2018; Figure 1). None have been scientifically excavated, however, so conclusive dating must await the results of future fieldwork. Most are named after mythical giants fabricated to explain these enigmatic features so it is unlikely their names will help identify the original builder or function.

Bolster Bank

The first is Bolster Bank, a single bank and ditch that cuts off a promontory of 486 hectares (1,200 acres) on the north Cornish coast (approximately SW 697 495 to SW 721 508) (Whitley 1881; Crawford 1953: 242; HES 1997). The promontory includes the prominent hill St Agnes Beacon and the dyke follows a semi-circular route around the foot of this hill from Chapel Porth in the west to Trevaunance Coombe to the north-east. The ditch is on the landward side while natural high cliffs flank the seaward side of the ground enclosed. The earliest record of the name is Bothlester is in 1398. Although this name was attached to a farm rather than the neighbouring earthwork, the name was possibly coined as the earthwork resembles an upturned boat; *both* is a protuberance and *lester* a boat in Cornish (Johnson 1980: 79; Padel 1985: 246; Morton-Nance 1999: 13 and 98). Borlase (1740) claimed the dyke also bore the names *kledh*, meaning ‘dyke’ (Carew in 1602 records *Whilancleuth*, ‘Dyke-mine’, presumably the same mine as *Wheal an Cleth* next to the dyke) and *Gorres/Gollet/Gullet* or ‘weir/dam’ (Carew 1602: 92; Lysons and Lysons 1814: ccxlvii; McLaughlin 1847: 28; Douch and Pool 1975: 203; Morton-Nance 1999: 23 and 27). Presumably, popular stories of a giant called Bolster building the dyke grew up after the Cornish language died out in the area (roughly between 1650 and 1700), which made the place-name incomprehensible for English speakers (McLaughlin 1847: 28; Hunt 1908: 73–75; Douch and Pool 1975 203–204; George 1986). Within a century, Borlase reported the story of the giant Bolster building the earthwork. This suggests that local folklore regarding dykes may have less antiquity than often assumed (Borlase 1769: 314).

Nicholas Johnson surveyed the dyke and this is the only comprehensive published study of any Cornish dyke (Johnson 1980). Like many other general county surveys that mention the earthwork, Johnson favoured an early medieval date and it is marked on the Ordnance Survey Map of the Dark Ages even though the early large-scale Ordnance Survey maps had labelled it ‘Roman Dike’ (Borlase 1769 313–314; Penaluna 1838: 162; Cornish 1906: 472; OS 1966; Weatherhill 1985: 26 and 42–43; Preston-Jones and Rose 1986: 139; Payton 1996: 72). Although the area enclosed is rich in tin, there is no archaeological evidence of ancient settlements within the circuit of the earthwork. The closest sites and finds to the earthwork are pre-Norman chapels which lie near either end and there are reports of late Roman coins found inside the enclosure on St Agnes Beacon (Borlase 1769: 314; Douch and Pool 1975: 203; Johnson 1980: 87).



Figure 2: Looking north towards St Agnes Beacon with Bolster Bank in the foreground (Photograph: the author)

Bolster Bank was possibly 3.3km long, but only about 1,000m of the central part are visible today (SW 705 493 to SW 716 500). The best-preserved sections of the ditch are between 0.7–2m deep and the bank 2.5–3.5m high while the ditch and the bank are both up to 6–9m wide (Johnson 1980; Weatherhill 1985: 42; Cole 2004: 9–10; Figure 2). Tonkin and Newton, writing in 1733 and 1847 respectively, give much larger dimensions for the bank, both saying that in places it was 20 feet (6m) tall and Newton giving figures of 30–40 feet (9–12m) for the width of the ditch (Newton 1847; Douch and Pool 1975: 203). However, Tonkin's figure for the width of the ditch, as with those given by Borlase in 1740 and 1769, tally with the 6m figure (Borlase 1769: 313; Douch and Pool 1975: 203; Johnson 1980: 79). Silting has now made most of the ditch almost impossible to see and, without a good map, distinguishing the dyke from other surrounding field boundaries is difficult. In 2004, Cornwall's Historic Environment Services under Richard Cole surveyed a small, damaged section (at SW 714 497) and excavated a small section 50cm wide and 20cm deep (Cole 2004). The unpublished report (no. 2004R082) noted simple stratification in the cross-section (probably as the original builders dug through different layers of material when digging the quarry ditch) suggesting the dyke was never rebuilt (some stone facing was seen but thought to relate to a later feature built alongside the dyke). Our preliminary conclusion is therefore that we know the monument is of a single phase even if the monument's date is uncertain.

Giant's Hedge

The second earthwork is the Giant's Hedge, a dyke that survives intermittently along a 11km stretch from the Lerryn River (a tributary of the River Fowey) to the West Looe River (from SX 136 567 to somewhere near SX 254 528) facing inland and cutting off



Figure 3: The Giant's Hedge looking east from the B3359 just north of Lanreath (Photograph: the author)

a territory roughly 13km by 6km (Crawford 1953: 242; HES 1990b; Figures 3 and 4). Borlase seems to be the first to record an association of the earthwork with giants; he also claimed the dyke reached as far as Lerryn and was a Roman road (Borlase 1758: 325). However, fieldwork by later writers makes those claims seem very unlikely as it is both too narrow and its route too sinuous for a Roman thoroughfare (Lysons and Lysons 1814: ccxxviii and ccxlv; Cornish 1906: 472; Andrew 1935: 215–217; Crawford 1936: 174). There is no dating evidence for the dyke, though Borlase reports the finding of Roman coins nearby on the banks of the Fowey River and also notes the dyke could not be easily outflanked as it terminates below the lowest fordable point of the estuaries at either end (Borlase 1758: 325). Just north of Lanreath, one of the most northerly points on the dyke, the earthwork forms a small salient round a hill which my fieldwork proved had good views to the north even though it is not the tallest in the area (Grigg 2015: 395).

Most scholars presume an early medieval date for the earthwork, though Parkes recently suggested it was a prehistoric boundary (OS 1966; Weatherhill 1985: 32; Preston-Jones and Rose 1986: 139; Todd 1987: 259; Payton 1996: 72; Parkes 2000: 7). For much of its course, erosion and agricultural activity has left the dyke as merely a scarp, but in Willake Wood (SX 153 569) it is well preserved (Weatherhill 1985: 32). The bank is

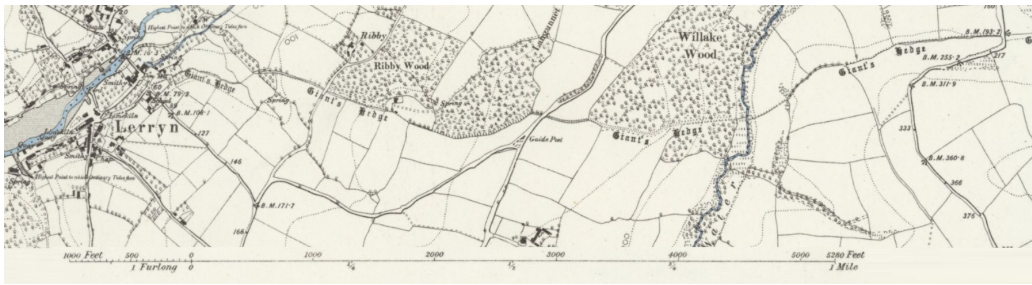


Figure 4: Map showing part of the route of the Giant's Hedge as shown on the Ordnance Survey's Six Inch map Cornwall Sheet XLIII.SW (surveyed: 1881, published: 1888) (Reproduced with the permission of the National Library of Scotland)

stone-faced and 2.5–4m wide and between 1–5m high, averaging around 1.5m on long stretches though the 5m figure is misleading as occurs where the bank is on a steep hillside that exaggerates the vertical elevation (HES 1990b). The ditch is 3–8m wide and around 0.8m deep (Todd 1987 259; HES 1990b). In the eighteenth century, Borlase reports the dyke was 7 feet (just over 2m) high, twenty feet (6m) wide and 7 miles (11km) long (Borlase 1769: 333). The Cornwall Archaeology Unit (report number GRH 37/3) carried out an unpublished watching brief on the line of the earthwork in 1984 at Kilminorth Wood. At this site the dyke was just over 1m tall and the front of the dyke had a single skin wall consisting of six courses of stones, but as with all the watching briefs of the earthworks in this article, no dating evidence was found (HES 1984).

Giant's Grave

The third candidate is the Giant's Grave dyke, a single bank and ditch earthwork, facing south-east and lying in the parish of Ludgvan (SW 508323 to SW 505320) in the southern part of a narrow neck of land that separates west Penwith from the rest of Cornwall (HES 1990a; Figures 5 and 6). The name seems to be of some antiquity (though certainly not medieval) as it is used on an 1838 Tithe Award of Ludgvan and linked to a story of Tom the giant killer filling the grave with one of his victims (Crawford 1936: 171–174). Lysons (1814) and Penaluna (1838) claimed parliamentary forces besieging the royalists in St Michael's Mount during the Civil War threw up the earthwork but give no source for the information (Lysons and Lysons 1814: 205; Penaluna 1838: 34; Lach-Szyrma 1885–1886: 80). Lysons' account of other dykes seems to come almost verbatim from the eighteenth-century antiquarian Borlase, but Borlase does not mention this particular earthwork. The bank is dissimilar to Civil War fortifications with their protruding artillery platforms and the location is over 2km from the causeway to the island, which is out of the range of guns of the period. The heights above Marazion are a far more likely location for any earthworks built to besiege the island. Though the guidebooks to St Michael's Mount suggest the siege was rather dramatic, the works built by the defenders on the island look hastily built and contemporary sources suggest the sieges

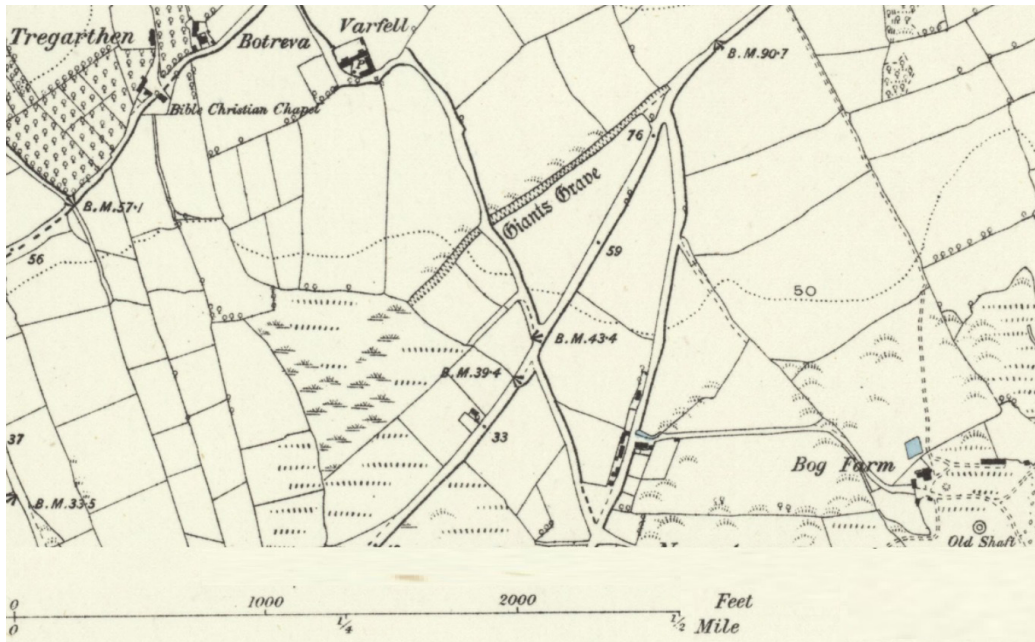


Figure 5: Giant's Grave as shown on the Ordnance Survey's Six Inch Cornwall Sheet LXVIII.SE (surveyed: 1877, published 1888) (Reproduced with the permission of the National Library of Scotland)

were rather brief and bloodless (Fairfax 1646; Herring 1991; Herring 1992). Professor Mark Stoye, an expert on Cornwall in the Civil War at the University of Southampton, and Peter Harrington, an expert on Civil War fortifications at Brown University Library, are sceptical of a Civil War date for the Giant's Grave and neither was aware of any tradition or source that linked it to the Civil War (personal communications).

At present, the Giant's Grave is about 350m long with the southern terminus flanked by boggy ground (Herring *et al.* 2016: 200–202). At the northern terminus of the earthwork the alignment of the dyke is contiguous with the present day A30 that runs across the neck of land to Hayle for nearly 6km. Before road widening in the mid-1930s, Crawford claims he could clearly see the old surface-line under the southern end of the road which could possibly be a reference to the earthwork and in an unpublished report for the Cornwall Archaeological Unit (now the HES) Peter Herring suggested the road may have obliterated the dyke (Crawford 1936: 174; Crawford 1953: 242; Herring 1991). If Crawford and Herring are correct, it could have reached the Bristol Channel and defined the whole west Penwith peninsula. The line of the A30 to Hayle does seem a good tactical alignment for a dyke with higher ground to the west and lower ground on the eastward side giving good views of anyone approaching the earthwork. Of course, if Crawford's observations of the Giant's Grave are correct the road may only have destroyed a small part of the dyke and the hypothetical northern extension might have only reached a few metres further than the present terminus. Sources of different dates give the size of the



Figure 6: The Giant's Grave from the west (Photograph: the author)

bank of the Giant's Grave as 1.8–3.3m high and up to 5m wide with the ditch as 7m wide, but none records the depth of the ditch (Crawford 1936: 174; HES 1990a; Herring 1991). Fieldwork during this study suggests for most of its length the bank is now about 2m high with a width of up to 5m, though in many sections later activity has reduced this to about 3m. Silting has obscured the ditch, so no meaningful measurement of the depth or width is now possible.

The Dodman

The penultimate candidate is The Dodman, one of two examples probably less likely to be early medieval. It cuts off a headland enclosed on three sides by steep cliffs in the parish of St Goran on the south coast of Cornwall (SW 999 397 to SX 003 400). As with many other Cornish dykes it is reputed locally to be the work of a giant and alternative names for it include The Deadman, Thica Vosa, Balk, The Bulwark, The Vallum and the Hack and Cast (Lysons and Lysons 1814: cccxlv; Cornish 1906: 458–460; Crawford 1936: 174; HES 1989a; Figure 7). The Victoria County History states that the sixteenth-century antiquarian Leland directly mentions Dodman, but his description of a fort near the shore 'a myle by west of Penare' in the parish of 'Gerons' is ambiguous (unfortunately there is both a Pennare and a Penare in the area) and could equally be Dingerein Castle

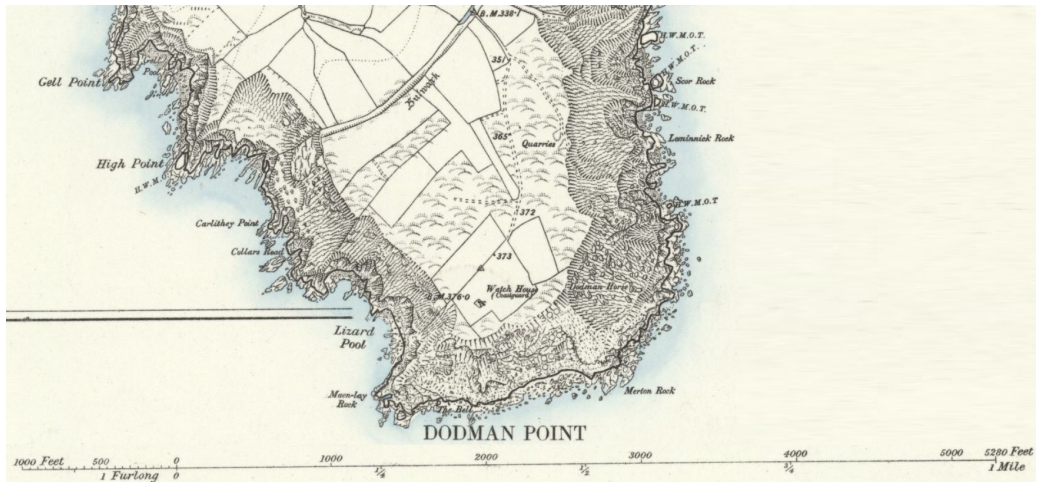


Figure 7: Dodman (marked at 'Bulwark') as shown on the Ordnance Survey's Six Inch Cornwall Sheet LXVI.NE & SE (surveyed: 1879, published 1888) (Reproduced with the permission of the National Library of Scotland)

or Veryan in the neighbouring parish of Gerrans (Cornish 1906: 458–460; Smith 1907: 201). Clearer references by Leland to the headland of Dodman, or Dudman as he spells it, do not refer to a fort or any other earthwork (Smith 1907: 322–323). While it has been speculated that Dodman derives from *tomen*, the Cornish for earth bank or dam, it was probably named after a local person as the family name was recorded in Cornwall as far back as 1201 and in 1469 a Dudman was recorded living in the nearby estate of Bodruggan (Weatherhill 1985 117; Padel 1988 79; Morton-Nance 1999: 166). No systematic study or excavation of the monument has occurred. The earthwork is about 700m long, but as both ends finish on an eroding cliff face it originally was probably longer. The earthwork has a large inner bank at least 2m high and 6–9m wide, a ditch on the landward side the bottom of which is 6.5 metres lower than the top of the inner bank (though the natural slope of the land exaggerates the drop) and a counterscarp bank 1.2–2m high (Cornish 1906: 460; Weatherhill 1985: 117; HES 1989a). A track now runs in the ditch, so the original profile and width is hard to determine.

Though often assumed to be an Iron Age fort, it seems unusually large protecting an area of 34 hectares, though the plateau is just 22 hectares (Forde-Johnston 1976: 97 and 137; Johnson 1980: 86; Johnson and Rose 1982: 190). The larger Iron Age cliff castles of Cornwall tend to have multiple banks and complex fortified gateways like that found at Maen Castle near Land's End (Cotton 1958–1959: 114–115), but these are lacking at The Dodman as the only entrance seems to be a later farm track that slices through the bank. It is a prominent site so may have been refortified in more recent times and local tradition claims this occurred as a defence against the Spanish Armada, though this is pure speculation (Parkes 2008: 66). However, a counterscarp bank is unusual for an early medieval dyke (though one is found on West Wansdyke) so without excavation

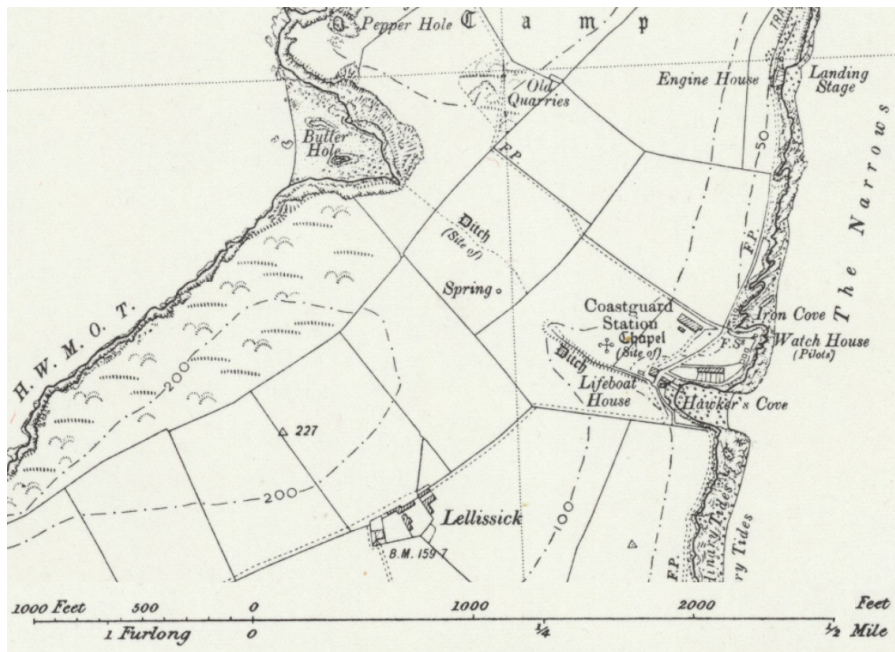


Figure 8: Stepper Point earthwork (marked at 'Ditch') as shown on the Ordnance Survey's Six Inch Cornwall Sheet XVIII.SE (revised: 1938, published: c. 1946) (Reproduced with the permission of the National Library of Scotland)

any assumptions about a date are speculative (Erskine 2007 86 and 101). Despite surveys being made of the interior, there is no evidence of a prehistoric settlement on the headland enclosed by the earthwork, though there are two barrows and clear signs of a prominent medieval field system.

Stepper Point

The final candidate is at Stepper Point at the mouth of the River Camel where there is a dyke that has no name of its own, separating a cliff-fringed headland from the mainland (HES 1989b; HES 1989c; Figure 8). The name of the point was originally Stuppert according to the director of the nearby Padstow Museum (John Buckingham personal communication) and appears on early seventeenth century maps as Stuppert (Norden 1600 and Speed 1605), which is possibly derived from an English personal name that dates from after the period under study in this paper. Ordnance Survey and Historic Environment Services surveys have variously interpreted it as an Iron Age camp or a medieval boundary bank. A 2007 Time Team dig on a settlement just outside the enclosed area, Lellissick, found pottery and other finds from the Iron Age and Roman period as well as high status fifth/sixth-century Byzantine pottery (aired 8 March 2008, though the published report makes no reference to the earthwork, Wessex Archaeology 2008).

The Time Team experts presumed the dyke was an Iron Age cliff castle, but if so, only The Dodman is of a similar size and the only pre-modern signs of settlement from within the dyke are some medieval ridge and furrow found during unpublished fieldwork (HES 1989b). Medieval documents from the Priory of Bodmin and a 1694 map indicate a chapel to St Sampson once stood on the headland, possibly where he was reputed to have landed in Cornwall (Henderson 1955). There is also a 1271 reference to a rabbit warren owned by the priory and as the ditch seems rather shallow and the present remains of the bank very slight, it could just be a later medieval warren boundary though only excavation could prove this (HES 1989c). The dyke was once probably about 300m long running from Hawkers Cove to Pepper Hole (SW 909 778 to SW 911 776). Only 55m of the earthwork is now visible above ground level due to past plough action (SW 909 779 to SW 909 778), though much of the rest of the course can be seen as a crop mark from the air. The dyke consists of a low bank with a wide shallow ditch on the south-west side facing inland.

Analysis of the size of the earthworks

Using the measurements of the earthworks from this study (obtained from fieldwork and published studies) we can attempt to calculate the amount of labour needed in their construction. The best way to calculate the amount of earth moved when constructing a dyke is to excavate the ditch, with the silt removed a ditch's original profile is revealed as the eroded parts of a bank are lost forever. Without clear excavation evidence and with most of the ditches heavily silted, measurements of the banks of Cornish dykes are unfortunately the best option.

The author has elsewhere produced a reliable estimate of the amount of earth an early medieval labourer could move in a day of 1.5–3m³ per day (Grigg 2018: 72–74). This figure for a digging rate, while obviously an estimate and would vary between people and during the day as the person tired, is probably quite robust as it is drawn from a number of sources including the author's own experiments. The sources that underpin this calculation include the Experimental Earthwork Project at Overton Down, builder's estimates, the Royal Engineer's handbook, records of soldiers digging in the First World War and accounts of Charlemagne having a canal dug (Jewell 1963, Hutchinson and Stuart 2003). Calculating the amount of labour used requires some assumptions, for example, we may assume that if a dyke is now intermittent it is because agriculture, urbanisation, industry or natural erosion has destroyed sections, but it is possible it was never continuous. Likewise, the assumption that the tallest section of the bank represents the best-preserved section may also be false if the earthwork was not originally uniform in design. Antiquarians may give larger figures for the length of the monument or the size of the banks because they saw the monument when it was better preserved, but we cannot be sure of the accuracy of their surveying techniques. The digging rate estimate also ignores the number of people involved in surveying the course of the dyke, organising the manpower and supplying the workforce, it simply tells us how many were required to dig it.

Earth banks are irregular semi-circles in profile; by plotting numerous dyke profiles on graph paper the author has found the surface area of the cross section is usually 60% of the width multiplied by the height of the banks. If we multiply the resulting number by the length of the dyke, we get an approximate figure for the volume of earth in the bank. The surviving 1,000m section of Bolster Bank is around 2.5m tall and 6m wide suggesting it was 9,000m³. Assuming it was originally closer to 3m tall (Tonkin's figure of 6m seems rather high suggesting that he may have been measuring from the bottom of the ditch to the top of the bank) and it did run the full 3.3km from Chapel Porth to Trevaunance Coombe it was probably 35,640m³. Assuming the Giant's Grave was 2m tall and 5m wide it was approximately 2,100m³, but if the hypothetical northern extension existed, it would have been very similar in size at 36,000m³. Assuming an average size of 2m tall and 4m wide for the Giant's Hedge when first built, it would have been larger at about 52,800m³. As the bank of the Giant's Hedge is partly stone, which takes more time to excavate, it would probably have taken a little longer to construct. Dodman a tenth of the size of the Giant's Hedge at about 5,040m³, but no accurate estimate for the Stepper Point dyke is possible as ploughing has flattened the bank. With a workforce of one hundred and assuming it was built in a single year, which is probably the size of some early medieval raiding armies, Bolster Bank might have taken up to 238 days to complete, the Giant's Grave around 14 days (though 240 days with the hypothetical northern extension), the Giant's Hedge 352 days and Dodman around 34 days. The construction of such earthworks probably could have only happened in the dry summer months before the busy harvest period.

Although these dykes are small compared with Offa's Dyke or Wansdyke, when compared with (for example) Iron Age hillforts these dykes, even in their present state, are impressive. The ramparts of the most common smaller hillforts are less than 2,000m³ while even larger examples, of which Carn Brea is the only Cornish example, are only 11,000m³ meaning the Giant's Hedge took around five times the labour to dig (Hogg 1975: 56–57 and 161–164). I conducted a great deal of fieldwork studying linear earthworks for my PhD and the better-preserved sections of Bolster Bank and the Giant's Hedge are far closer in height and design to early medieval earthworks. By way of contrast, prehistoric earthworks often have multiple banks or branches that the Cornish examples lack (Grigg 2015: 77).

The functions of the Cornish dykes

The size and length of these earthworks (which together stretch for at least 15km across the Cornish landscape) suggest that these were important structures and there was probably pressing reasons needed to motivate people to build them. By examining the evidence against the various theories, we can perhaps understand why the dykes were built and what function they originally served. Obviously, any earthwork can serve a multitude of uses long after their initial one has become obsolete, like being reutilised as a field boundary (as large stretches of the Giant's Hedge or Bolster Bank are today), but such secondary uses are not necessarily related to their primary function and therefore outside the scope of this study.

Firstly, we can examine the theory that they delimited kingdoms. We would expect an agreed frontier between the kingdom of Cornwall and that of the West Saxons (both a political and a cultural boundary between the English and Cornish) to be a north-south dyke parallel to the Tamar which none of the dykes are. Cornwall might have been divided into subkingdoms owing allegiance (even if nominally) to a wider ruler, but only two seem to delimit an area possibly large enough: the Giant's Grave (if it did cut off the Penwith peninsula) and the Giant's Hedge. Each delimit large areas with more than one settlement in them, but even in these cases they would be very small polities (respectively 25 and 13km across at their very widest points). The Giant's Grave, if the hypothetical northern extension did exist, delimits an area that is just half a hundred (Penwith) and historians have usually assumed Cornish hundreds preserve the outline of the early subdivisions of the kingdom of Cornwall though as Turner rightly postulates they easily date to a reorganisation when Cornwall fell under West Saxon rule (Padel 1985: 226; Preston-Jones and Rose 1986: 137; Soulsby 1986: 25; Dark 1994: 155; Thomas 1994: 215–217; Payton 1996: 72; Turner 2006 113–118). The area protected by the Giant's Grave dyke contains a place-name, Lesingey, that suggests a ruler's settlement or prince's hall (a 'lys') and old Penzance market cross, according to Macalister, records a tenth-century king Ricatus though few accept now accept that interpretation (Macalister 1929: 188; Macalister 1949: 180–182; Preston-Jones and Rose 1986: 139; Soulsby 1986: 25; Turner 2006: 56–57). Perhaps it could have functioned as a border marker of a small kingdom ruled by a petty king (like Macalister's Ricatus) even if it was not originally designed as such, but the area seems rather small and the word 'king' on the Penzance cross is probably a figment of Macalister's imagination and other carved stones of that period record names without a title that suggests they were a king (Okasha 1993: 198).

The authors of many surveys of Cornish history have assumed the Giant's Hedge also marks the boundary of a post-Roman petty kingdom (Lysons and Lysons 1814: ccxxviii; Weatherhill 1985: 32; Preston-Jones and Rose 1986: 139; Todd 1987: 259; Payton 1996: 72). However, the area forms less than a small fraction of the local Hundred (West Wivelshire) and there are no 'lys' place names in the area enclosed (Holmes 1983: 8; Padel 1985: 150–151; Preston-Jones and Rose 1986: 139). The area contains a handful of villages (like Polruan, Pelynt, Polperro and Porthallow), one small town (West Looe) and a few hamlets. If these dykes were the borders of kingdoms, we would expect them to influence later administrative boundaries and perhaps have names that either reflect their function as a border or record the name of the kingdom. However, these dykes are named after giants, hundred boundaries ignore the dykes and only the hypothetical northern extension of the Giant's Grave follows a parochial boundary. To build such borders would have taken at least a hundred labourers digging every day for about eleven months, though if digging were limited to the summer, this would have spread over at least three years (a massive strain on communities reliant on farming and fishing). It would be difficult for such small hypothetical sub-kingdom to spare such numbers (remember that they involved earth being moved on a larger scale than any prehistoric monument in Cornwall) making it possible, especially for the Giant's Hedge, that the

builders drew on labourers from outside the enclosed area. If the Giant's Grave and Giant's Hedge were borders it seems highly unusual that they would mark their borders with such ambitious earthworks when other larger kingdoms in the region did not.

Some other possible functions of early medieval dykes are even more unlikely than the kingdom border theory and can only be applied to the longer Cornish earthworks. While farmers have reused most as field boundaries and the earthworks tend to look like hedgerows today, they were built on a much larger scale than typical Cornish field boundaries. Fieldwork suggests most hedgerows adjoining the dykes seem about 1m tall and 2m wide, but the banks of the dykes are usually at least twice as high and three times as wide and none of the dykes enclose an area small enough to be a field. Though Borlase thought the Giant's Hedge a Roman road and the route of the Giant's Grave may look like a perfect transshipment route from Hayle to Mount's Bay avoiding a sea journey round Land's End, none of the Cornish earthworks would make a good road. The profile of the Cornish earthworks is very different to a road, where the banks are well-preserved they are both too tall and too narrow, roads invariably have ditches on both sides for drainage while all these earthworks only have a ditch on one side and the Giant's Grave (the earthwork whose route is most likely to mark a routeway) ends in a bog. The road theory seems highly unlikely.

If the dykes enclosed areas of religious significance, we would perhaps expect formal gateways to allow the faithful access to the sites behind (or to make sure only the sanctified enter) and to find religious sites like a monastery in the areas defined by the earthworks. There are many stone circles to the west of the Giant's Grave (though this may be coincidental) and there was a chapel at Stepper Point. St Agnes Beacon is very prominent and might have once been a place of religious significance, but apart from some run-of-the-mill parish churches, there are no especially significant religious sites in the area defined by the Giant's Hedge. No archaeological finds such as offerings have been found associated with the dykes and no religious site is directly attached to these Cornish earthworks so a theory of a ritual or religious function for building these earthworks is probably best laid aside.

The areas enclosed by most of these dykes are much too large to be fortified settlements though this seems exactly the function for the Tintagel earthwork and is a possible explanation for Stepper Point and Dodman. Until we find early medieval settlement evidence in the area enclosed by the latter two earthworks it is impossible to prove. The position of the earthworks suggests they did not control land trade (which flowed along the east-west spine of Cornwall or from the sea), though the Tintagel earthwork may have helped protect the wealthy seasonal settlement on the headland. The Giant's Grave could have help regulate overland trade with west Penwith, but it is unlikely this small area could attract enough merchants to justify the labour involved in erecting a trade barrier. Goods from Brittany to Wales or Ireland were transhipped across the neck of Penwith, or along the so-called Saint's Way between the Fowey and Camel

estuaries yet large linear earthworks do not cut these routes. Trade barriers require gateways and booths where the border guards could collect tolls and inspect goods, every gap in these dykes is crude and post-dates their construction. Crawford thought the Giant's Hedge might be the beachhead defences of an invader, though he did not speculate who they were and most known invasions from the Continent landed much further east where the English Channel is narrower (Crawford 1953: 186). Mythical giants, not hypothetical kings who ordered their construction give their names to the dykes, so glorifying a leader was perhaps also not their main function.

The dykes are not identical in size, length and construction technique (the Giant's Hedge, for example, is stone faced while the Dodman has a counterscarp bank), but they have similarities: a single bank around 2m tall and 5–6m wide with a single ditch of a similar scale (with the exception of Stepper Point, which is possibly later medieval). While Dodman may be Iron Age, forts from that period have obvious gateways with in-turned banks, bastions, outlying or flanking ditches that mark the entrances, features which all these dykes lack (Weatherhill 1985: 20). All these dykes run to and from coastal inlets cutting off peninsulas that are mostly protected on the seaward side by high cliffs and while dykes like this are found elsewhere in Britain (for example Dane's Dyke in Yorkshire) this form is rather unusual. The similarity in designs and location of the Cornish earthworks suggests that they could have been a reaction to a single stimulus and as all have a ditch on one side barring access to compact defensible areas of land and fieldwork carried out by the author has shown that many have a prominent hill or rise within the circuit giving clear views of anyone approaching (St Agnes Beacon with Bolster Bank and Lanreath with the Giant's Hedge), a military function is worth considering.

Raiding and dykes

If the linear earthworks are early medieval in date, this period was a time of instability so perhaps these dykes were built against enemy attacks like the one recorded in the Anglo-Saxon Chronicle in 815 when the West Saxon king Egbert raided Cornwall from east to west (Bately 1986: 41; Swanton 2000: 59). While the smaller examples could have acted as refuges for large numbers of people and cattle, the larger dykes may have acted as stop lines set back from a vulnerable border designed to defend the core of Cornish sub-kingdoms during the eighth and ninth centuries, which is why they only cover a small part of a Hundred yet possibly utilised labour from a larger area. Parallels with similar English dykes are apparent. Early medieval dykes were not on the edge of a kingdom as the dykes had no permanent garrisons and therefore were vulnerable to surprise attack; their location cleverly allows local levies to gather on them while raiders are still in the marches. Wansdyke, if it is a West Saxon work, is some distance south of the probable Mercian border it faces and there were settlements whose place-names suggest a Middle Anglo-Saxon origin west of Offa's and Wat's Dyke (Hill and Worthington 2003; Reynolds and Langlands 2006).

The Cornish dykes are set back from the Tamar (and therefore the West Saxons) and beacons, for example St Agnes Beacon (a superb viewpoint visible from as far afield as Camborne), could have warned people to retreat to the dyke (Douch and Pool 1975: 203–204; Johnson 1980: 79). Similarly, at Tintagel a large ditch that we are far more certain is early medieval in date, defended the settlement on the cliff-fringed peninsula from landward attack; this settlement was probably an important trading settlement and large numbers of early medieval Mediterranean sherds of pottery have been found on the headland (Dark 1985: 13; Thomas 1993: 58–59; Morris 1998). Raiders from other areas (like the West Saxons) could not outflank the Giant's Hedge as both ends are below the lowest fordable point on the Fowey and Looe estuaries. Peasant levies protecting the land against incursion will often run in the face of determined raiders, but a dyke would give them confidence and a fixed point to make a stand, while raiders, always looking for easy targets, would leave a manned dyke alone (the connection between early medieval dykes and raiding is explored in detail in the author's other published works, e.g. Grigg 2018). After the West Saxon raiders went home, the people could rebuild their ravaged farms, their livestock would be safe behind the earthworks. If the dykes were temporary measures during times of crisis set back from the borders of a territory this would explain why they do not influence later hundred or parish boundaries. Research for my doctoral investigation of earthworks across Britain demonstrated that prehistoric earthworks were more likely to be reutilised by parish boundaries than the more recent early medieval dykes (for reasons that are unclear to us), further suggesting an early medieval date for the Cornish earthworks (Grigg 2015: 52–55). As the Cornish earthworks if they were early medieval in date, would have rapidly fell out of use once the areas fell under West Saxon rule (roughly the tenth century Padel 2022: 66–68), locals soon forgot the names of their builders. This also occurred across Britain (with Offa's being the notable exception); in Cornwall stories of giants grew up to explain their existence in a similar way to the stories of the Devil building many of the dykes in parts of England.

Conclusions

Some of the similarities between the dykes of Cornwall (the size of the banks, the lack of gateways and their locations cutting off headlands, peninsulas and promontories) suggest that they could have been a reaction to a single stimulus, in this case it has been suggested raiding, and the differences in the length of them may have arisen as the builders were inhabitants of different sub-kingdoms or districts of Cornwall. By not defending the early medieval Anglo-British political, cultural and linguistic border with a north–south earthwork near the Tamar, the West Saxon kings could rampage along the spine of Cornwall demonstrating their martial might while the Cornish were safe behind their dykes (which includes the settlement of Tintagel) not destroyed in a decisive battle. The Anglicisation that occurred as Wessex expanded into Devon, Somerset and Dorset never occurred on the same scale in Cornwall (and some say Cornwall has never felt fully English). The process whereby areas of lowland

Britain became convinced of their Anglo-Saxon ancestry was so thorough in the fifth to seventh centuries that the Devon-born St Boniface in the early eighth century thought it his duty to convert his ‘cousins’ in Germany. Uniquely in south-west Britain, the inhabitants of Cornwall never completely adopted the English language for over a thousand years and Brythonic place names (especially in the central and western parts) abound (George 1986; Padel 1988; Drake 2018). The maritime links Cornwall maintained with Brittany up until the Reformation perhaps bolstered a Brythonic culture (Soulsby 1986: 78), but the south coast of Devon is as easy to reach by sea from Brittany, while north Devon and Somerset are only a short voyage from Wales they are all thoroughly Anglicised. Control of Cornwall was certainly an attractive prospect to the kings of Wessex as her mineral wealth had attracted merchants from as far away as the eastern Mediterranean from Phoenician times until the reign of the sixth-century Byzantine Emperor Justinian (Fulford 1989). The Tamar was never an impassable barrier as the English names for the eastern Hundreds of Cornwall probably reflects West Saxon influence of those parts of Cornwall nearest to Devon. The dykes of Cornwall may crucially have provided refuges allowing Cornish society to weather the aggressive early stages of West Saxon expansion and so maintain a distinct identity longer which allowed the language to weather the early storms of the expansion of Old English when other parts of lowland Britain quickly lost any native language (and associated non-English identity) they might have had.

Any hypothesis about individual Cornish linear earthworks or dyke building in Cornwall in general can never be conclusive without dating evidence. While archaeological excavations of dykes rarely produce good dating artefactual evidence as is the case with towns, it would at least reveal how deep the ditches were, if they were rebuilt in the past, did they originally had entrances, if the dykes did exist in sections where agriculture has removed all surface traces and would be an opportunity to apply OSL dating methods that is helping us understand the chronology of other earthworks like hedgerows. It is entirely possible some of the dykes mentioned in this study do not date from the early medieval period and the author is well aware that if they are later medieval or prehistoric in date then the discussion about their function has been rather hypothetical (the earthwork on Stepper Point is far more likely to be a later medieval rabbit warren for example). They may have had more than one function and been reused at different times for different purposes, but at present, defences built by the early medieval Cornish to counter West Saxon raiding seems a likely possibility worthy of consideration.

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