

Offa's Dyke Journal



Volume 3

Edited by Howard Williams and Liam Delaney

Aims and Scope

Offa's Dyke Journal is a peer-reviewed venue for the publication of high-quality research on the archaeology, history and heritage of frontiers and borderlands focusing on the Anglo-Welsh border. The editors invite submissions that explore dimensions of Offa's Dyke, Wat's Dyke and the 'short dykes' of western Britain, including their life-histories and landscape contexts. *ODJ* will also consider comparative studies on the material culture and monumentality of frontiers and borderlands from elsewhere in Britain, Europe and beyond. We accept:

1. Notes and Reviews of up to 3,000 words
2. Interim reports on fieldwork of up to 5,000 words
3. Original discussions, syntheses and analyses of up to 10,000 words

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University of
Chester

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Collaboratory through Crises: Researching Linear Monuments in 2021 Howard Williams	1
Patrons, Landscape, and Potlatch: Early Medieval Linear Earthworks in Britain and Bulgaria Paolo Squatriti	17
Offa's Dyke: A Continuing Journey of Discovery Keith Ray, Ray Bailey, Tim Copeland, Tudur Davies, Liam Delaney, Dick Finch, Niall Heaton, Jon Hoyle, Simon Maddison	33
Using Lidar Survey to Locate and Evaluate Offa's Dyke Liam Delaney	83
Offa's Dyke in the Landscape: Comparative Size and Topographical Disposition as Indicators of Function David A. Humphreys	108
Exploring Linear Earthworks across Time and Space: Introducing the 'Monumentality and Landscape: Linear Earthworks in Britain' Project Nicky Garland, Barney Harris, Tom Moore and Andrew Reynolds	129
Rethinking Wat's Dyke: A Monument's Flow in a Hydraulic Frontier Zone Howard Williams	151
What's Wat's Dyke? Wrexham Comic Heritage Trail Howard Williams and John Swogger	183
Drawing the Line: What's Wat's Dyke? Practice and Process John Swogger and Howard Williams	211

Collaboratory through Crises: Researching Linear Monuments in 2021

Howard Williams

This article introduces the third volume of the Offa's Dyke Journal (ODJ). As well as reviewing ODJ 3's contents, I present reviews of the journal received to date, notable new publications on linear monuments, and the Collaboratory's key activities during 2021. The context and significance of the research network's ongoing endeavours are presented set against intersecting academic and public crises affecting the study and public's engagement with past frontiers and borderlands.

Keywords: borderlands, Collaboratory, crises, frontiers, linear earthworks

Introduction

Providing a dedicated venue for new research on the early medieval frontiers and borderlands of the island of Britain, the *Offa's Dyke Journal (ODJ)* is also the first and only open-access peer-reviewed academic journal dedicated to the investigation of frontiers and borderlands in deep-time perspective. The journal's remit spans detailed and original explorations into landscapes, earthworks, monuments and material culture. Exploring specific themes and issues in the archaeology, history and heritage of frontiers and borderlands in comparative and global perspective, *ODJ* is edited and produced under the auspices of the interdisciplinary research network, the Offa's Dyke Collaboratory, and funded by the University of Chester and the Offa's Dyke Association.

Each volume to date includes both original peer-reviewed work as well as 'classics revisited' papers. The latter are articles which have been re-edited, formatted and re-published with permission, often with revised and augmented maps and images. The aim is to make these works of enduring merit available to fresh audiences and accessible through an open-access digital format for the first time. In this task, the journal editors – Howard Williams (HW) and Liam Delaney (LD) – have been ably assisted by our digital publisher: JAS Arqueología. Furthermore, archaeological publishers Archaeopress have generously agreed to sell and distribute print copies of *ODJ* as well as host free downloads on their own website.

ODJ's existing editorial board has been further enhanced by leading experts in relevant themes and debates central to the journal's remit working across disciplines (see masthead for details). The editorial board will provide expert guidance and support for the editors as well as shape the direction of the journal into the future. Each issue is supported by the hard work of expert anonymous referees. Their invaluable evaluations of manuscripts have sustained the journal's character and quality.

Past volumes: volume 1 for 2019 and volume 2 for 2020¹

Volume 1 for 2019 presented both the Offa's Dyke Collaboratory and *ODJ* via an introductory article by the editors. Four original peer-reviewed articles followed: two presenting fresh investigations of early medieval linear monuments in western Britain (by Paul Belford for Offa's Dyke and Wat's Dyke, and Andy Seaman on Llywarch Hen's Dyke), one on the results of new fieldwork on the Danevirke (by Astrid Tummuscheit and Frauke Witte), and a further article on the heritage interpretation of linear earthworks and borderlands using the example of the Oswestry Heritage Comics Project (by John Swogger). *ODJ* 1 also contained two 'classics revisited' pieces: one by Ann Williams on historical sources and archaeological evidence for Offa's Dyke and the other by Margaret Worthington Hill reviewing her interpretations of Wat's Dyke.

Volume 2 for 2020 was opened by a review of the Collaboratory's 2020 activities. This was set in the wider context of the challenges of both the COVID-19 pandemic lockdowns as well as the specific moves to decolonise the British landscape in play during 2020. Following this, *ODJ* 2 contained four original peer-reviewed articles addressing the history of studying linear earthworks (Mark Bell), the pseudoarchaeology of linear monuments (Keith Fitzpatrick-Matthews), heritage interpretation and contemporary reception using the case study of the Faesten Dic, Joyden's Wood, Kent (Ethan Doyle White) and an investigation of the place-names associated with Wat's Dyke and Offa's Dyke in the Welsh Marches (HW). Again, these were joined by two 'classics revisited' articles: David Hill on the northernmost stretches of Offa's Dyke and Wat's Dyke and Tim Malim on Grim's Ditch and Wansdyke.

Published reviews of the journal's volumes 1 and 2

I would like to note two published reviews offering critical acclaim for *ODJ* volumes 1 and 2 which I share here to reflect on the standing of the publication. Eminent Roman frontiers expert Professor David Breeze wrote in *Current Archaeology* that *ODJ* was an:

exciting new development, challenging past practices whereby reports on individual monuments might be published in a range of local and national journals. This is especially important with linear monuments – Roman frontiers just as much as Offa's Dyke – where there is a lot of dispersed information... [It] is good news for the researcher who will now be able to find all their material between two covers. (Breeze 2021)

Breeze concludes his generous review by wishing us well with our new venture and noting that the papers meet our editorial aspirations and that the journal is 'attractively produced' (Breeze 2021).

The second review is by archaeologist Tim Malim in *Archaeologia Cambrensis*, the journal of the Cambrian Archaeological Association. Reviewing both volumes 1 and 2, Malim

¹ For simplicity, citations to articles in *ODJ* 1 and 2 are excluded from the bibliography.

vindicates the Collaboratory’s vision for the publication when he states (echoing Breeze): ‘The benefits of bringing many papers on this topic together into a single journal will facilitate future research and should generate collective debate’. Malim perceives *ODJ* as an ‘altruistic attempt to join up the many individuals who have an interest in dykes, for research, for management, and for public enjoyment, so that understanding can be enhanced into what issues and approaches should be adopted for ensuring the future investigation and safeguarding of these enigmatic monuments’ (Malim 2021: 283). He regards volume 1 as ‘an exceptional series of articles...’

I would like to take this opportunity to explain one minor misunderstanding presented in Malim’s review: that one of the photographs in David Hill’s 1991 book chapter republished in *ODJ* 2 was accidentally not reproduced (Malim 2021: 286). This was not the case; we decided to omit one of the original photographs showing excavations at Sychdyn due to its poor quality. Our footnote 1 for the article explicitly stating: ‘... this last photograph is of such poor quality that its reproduction in this venue is thought to have no merit.’ (Hill 2020: 141). The confusion presumably arose from Malim reviewing the print version of *ODJ* 2 which inadvertently failed to publish this explanatory footnote.

In summary, the editors did not anticipate *ODJ* receiving reviews in other publications. Both the evaluations of Breeze and Malim are very welcome. Together they demonstrate the necessity and merits of this open-access digital publication initiative.

Volume 3 for 2021²

This volume, *ODJ* 3 for 2021, is a further and significant landmark in the journal. This is not only because of the high-quality and distinctive merits of each individual article. It also relates to the scale and variety of the contents and the new projects they report on, from doctoral research to large collaborative (multi-institutional) research projects. In addition, it is a remarkable achievement for all concerned given that the incredibly challenging circumstances of 2021 have affected both authors and editors in multiple regards.

This volume begins with a ‘classics revisited’ piece by Paolo Squatriti, originally published in 2001 and titled ‘Patrons, landscape, and potlatch: the case of Bulgaria and England in the Early Middle Ages’. Twenty years on, this article is still pertinent. It has been revised, updated and republished with new images, plus a map by Liam Delaney, with the permission of the author, the original editors (Pamela Berger, Jeffery Howe and Susan A. Michalczyk), and the original publisher Peter Lang. Squatriti takes a comparative perspective on Offa’s Dyke (Wales and England) and the Erkesiya (Bulgaria), considering both monuments to be expressions of royal power and authority in their respective contexts of early medieval statecraft.

² As with articles in volumes 1 and 2, formal citations to articles in volume 3 are omitted.

Lead authored by Keith Ray and drawing together new insights and observations in collaboration with a range of amateur groups and professionals between 2016 and 2020 in various locations from Gloucestershire to Flintshire, 'Offa's Dyke: A Continuing Journey of Discovery' builds on Ray and Bapty's (2016) survey and interpretation of Offa's Dyke. The article presents interim results on multiple new proposed lengths of Offa's Dyke in both the Wye Valley in the south and between the Alyn Valley and Prestatyn in the north. The article also communicates new insights into the design, composition and placement of Offa's Dyke in Montgomeryshire and Shropshire. Together, Ray *et al.* show how much more there remains to discern and learn about Britain's longest linear monument.

Debates persist regarding the age and original farthest extent of Offa's Dyke. LD's article complements the article by Ray *et al.* by making a further significant methodological contribution. Investigating Lidar data, LD makes a series of fresh observations which transform our understanding of Offa's Dyke's route, extent and placement in the early medieval landscape. The results show convincingly for the first time that Offa's Dyke originally ran near-continuously south-east from Rushock Hill, still discussed by some as the southern end of Offa's Dyke's principal stretches, across the Hereford plain to the River Wye. LD's work also contributes to our understanding of the Wye as a natural frontier thereon. More than demonstrating the potential of his method and extend the known course of Offa's Dyke, LD's article has wider implications for approaching why, how, where, when and what these linear earthworks were constructed.

What was the precise function of Offa's Dyke? The scale and placement of Offa's Dyke are the focus of a new GIS analysis focused on a key stretch of the monument at Llanfair Hill, Llanfair Waterdine, Clun Forest, Shropshire by David A. Humphreys. Comparing the scale of this well-preserved section of Offa's Dyke with other early medieval linear earthworks – East Wansdyke and Devil's Dyke – Humphreys shows that Offa's Dyke, while still monumental, is relatively slight in scale. Meanwhile, his GIS viewshed analysis systematically identifies that Offa's Dyke did not adopt a position in the landscape to prioritise a west-facing visual envelope. Together, these factors argue against considering Offa's Dyke as primarily a military installation.

Nicky Garland, Barney Harris, Tom Moore and Andrew Reynolds provide a further comparative perspective in both spatial and chronological terms. They report on the first phase of an important and distinctive new project exploring Britain's linear earthworks dating to the first millennium BC through to the Early Middle Ages in comparative terms: 'Monumentality and Landscape: Linear Earthworks in Britain' funded by the Leverhulme Trust. Following a valuable survey of past research, they introduce the project and address issues of definition and interpretation. They identify the principal case studies and present preliminary observations from South East Britain. The project aims to pursue these observations further through fresh field investigations and analytical mapping leading towards the publication of the *Atlas of Linear Earthworks in Britain*.

Attention then shifts next to Offa's Dyke's shorter neighbour – Wat's Dyke – in a triad of original contributions. HW considers this linear monument as an element of a hydraulic frontier zone and reconsiders the earthwork's relationship with land routes as well as watercourses, wetlands and the Dee Estuary by considering its orchestration of local, middle-range and long-distance mobilities. Then, HW and John Swogger present their new collaboration for interpreting the monument for people today: *What's Wat's Dyke?: Wrexham Comic Heritage Trail*. Finally, building on a preliminary rationale published in *Public Archaeologies of Frontiers and Borderlands* (Gleave *et al.* 2021), John Swogger and HW co-author a critical reflection on the collaborative practice and process of making the *What's Wat's Dyke?* comic.

Together, the range of fresh research presented in ODJ 3 reveal the many original avenues available for exploring linear earthworks as well as investigating their landscape contexts and via comparative perspectives. The articles also address how we build fresh avenues of public engagement and heritage interpretation for linear earthworks.

New research on linear earthworks published elsewhere

The introductions to both ODJ 1 and 2 considered new publications on aspects of frontiers and borderlands focusing on linear earthworks. I continue the tradition here in order to place the articles in ODJ 3 in context. While there are other relevant new academic publications, five studies show how research on linear earthworks is by no means restricted to this journal.

In a fresh collection on mobility in prehistory, Emily Fiocppprile (2021) evaluates the linear earthworks of the Yorkshire Wolds. Focusing on using GIS Least Cost modelling of the Huggate Dykes, she evaluates their relationship with the movement of people and animals between locales. Alongside Murrieta-Flores and Williams (2017), Williams and Delaney (in ODJ 1) and Humphreys (this volume), Fiocppprile demonstrates the potential of GIS analyses for refined understandings of how linear earthworks operated to choreograph past mobilities on a range of scales.

Blaise Vyner (2021) presents an evaluation of an 'enigmatic earthwork boundary' bisecting the western tip of St David's Head, Pembrokeshire, Ffos y Mynach ('the monk's dyke'). Following a detailed and critical evaluation of past research and new mapping, Vyner postulates two phases of earthwork construction, both possibly dating to Irish settlement in South West Wales in the fifth or sixth centuries AD. Notably, in addition to evaluating the dyke's interaction with historic land routes, Vyner gives due attention to how the dyke carefully follows watercourses across the peninsula but also how it afforded control over usable landing beaches, emphasising its connection to seaborne travel. In this regard, while a far smaller earthwork in terms of magnitude and length, and therefore of likely different authorship, date and function, Vyner's evaluation finds parallels in the 'hydraulic' perspective offered by Williams in this volume. Specifically, Vyner might not

be fully accurate to regard Ffos y Mynach as 'exceptional in utilising watery areas and watercourses' (Vyner 2021: 101).

Keith Ray (2021) contributes to the volume edited by Heather James and Toby Driver celebrating 175 years of *Archaeologia Cambrensis* called *Illustrating the Past in Wales*. Ray provides a succinct review of Cyril Fox's contributions to the systematic surveying of both Offa's Dyke and Wat's Dyke. Together with the contributions by Bell and Fitzpatrick-Matthews to ODJ 2, Ray's illustrated essay emphasises the importance of critical evaluations of the history of research into linear monuments, including theories, methods and practice.

A further notable publication deserves comment for its integration of recent research on Offa's Dyke and Wat's Dyke into a broader historical narrative. Marc Morris' *Anglo-Saxons* (2021) counters seeing Offa's Dyke as a military barrier and following Squatriti (2002) and Ray and Bapty (2016) argues for its significance as an expression of Offa's power and authority (Morris 2021: 136) and also he regards the Dyke as reflecting, and perhaps constituting, a sharpening sense of English ethnicity – shared economic, cultural, religious as well as political affinities between the Anglo-Saxon kingdoms – in opposition to the Britons to the west. Morris argues this was instigated by Offa's hegemony south of the Humber (Morris 2021: 167–168). Regarding Offa's Dyke as a mechanism for engineering hegemony but also ethnogenesis certainly requires further exploration in relation to place-name, archaeological as well as historical sources. Morris is to be commended for (albeit briefly) not completely forgetting Wat's Dyke (Morris 2021: 134, 144, 179).

Complementing these reviews and discussions of ancient linear earthworks, Louisa Campbell (2021) considers how linear monuments can be mobilised to counter colonial narratives in the contemporary world. Complementing recent contributions on the significance of prehistoric, Roman and early medieval monuments in contemporary perceptions and engagements with frontiers and borderlands (Gleave *et al.* 2020), Campbell identifies creative ways in which postcolonial discourses might be materialised for the Antonine Wall. Focusing on replicas of the Distance Sculptures commissioned by the Rediscovering the Antonine Wall Project, she identifies how they serve 'as an effective vehicle to subvert and flip colonial narratives and reframe the stories told in the stones' about the Roman frontier (for context, see also Jones 2020). Campbell's insights, specifically regard how communities can be critically engaged in impactful ways through replicass can be seen as contrusively interplaying with the discussions by Swogger article in ODJ 1, Williams on decolonising linear monuments in ODJ 2, and Swogger and Williams in this volume. It is clear that the future promises many opportunities for new media and strategies of public engagement to foster fresh readings of the stories of past frontier works and linear monuments. As Brophy (2021) rightly posits, our work must, however, challenge simplistic colonial, nationalistic and indigeneity narratives which often compete and conflict through the heritage conservation, management and interpretation of linear monuments and their associated artefacts, sites, monuments and landscape contexts.

Having reviewed the content and context of the journal and its third volume, and then identified further examples of new studies on pertinent themes, I next survey the public engagement activities of the Collaboratory in 2021.

Collaboratory activities in 2021

Due to the ongoing COVID-19 pandemic lockdowns and restrictions affecting Wales and England, archaeological fieldwork and face-to-face activities has been limited during 2021. Desk-based research and public engagement activities have been also impeded and curtailed. Collaboratory activities have been thus rather restricted and no new specialist or public events have been planned since the April 2020 ‘Special Offa’ public conference adapted for digital delivery at short notice. However, the Collaboratory has remained active through digital media and a host of activities are in preparation for the easing of COVID-19 restrictions in 2022. Moreover, the Collaboratory convenors and members have initiated and contributed to a range of socially distanced face-to-face activities and initiatives as well as digital engagements linked to the research network’s principal aims. The brief summary here makes no claims at being exhaustive and the Offa’s Dyke Association’s range of activities is far broader still, including the important development of setting up an Offa’s Dyke Rescue Fund to support the monument’s conservation and management for future generations.³

As well as contributing to the aforementioned publications and *ODJ* itself, the WordPress blog *The Offa’s Dyke Collaboratory* has been an active venue for disseminating insights by Collaboratory members.⁴ Notable among these are four posts by Professor Keith Ray collectively titled ‘How much work was involved in building the Dykes of the Mercian frontier?’ (Ray 2021b–e). Further reflections on the construction, composition and placement of Offa’s Dyke (Williams 2021a–b) and the afterlife, heritage, art and waymarkers of the monument (Williams 2021c–f). Wat’s Dyke has not been neglected: 2021 has seen a post by Collaboratory member Culann Robinson on ‘The Hidden Heritage of Wat’s Dyke’ (Robinson 2021) and another considers the experience of visiting Wat’s Dyke between Hope and Penryffordd, Flintshire where no footpath follows the monument itself but a series of paths bisect its line (Williams 2021g). Together, these examples illustrate the enduring value of blogging as a media to encourage interim and innovative discussions of linear monuments as well as to show-case new voices.

Professor Keith Ray also dedicated himself to the creation of the new bilingual exhibition at the Offa’s Dyke Centre in collaboration with David McGlade and others involved in

³ <https://www.crowdfunder.co.uk/p/offas-dyke-rescue-fund>

⁴ In 2021, posts by Williams on his *Archaeodeath* WordPress blog on linear earthworks have not been consistently translated to *The Offa’s Dyke Collaboratory*. While rectified in December 2021, some of the citations herein refer to the *Archaeodeath* versions to more accurately reflect when they were first composed and disseminated online.

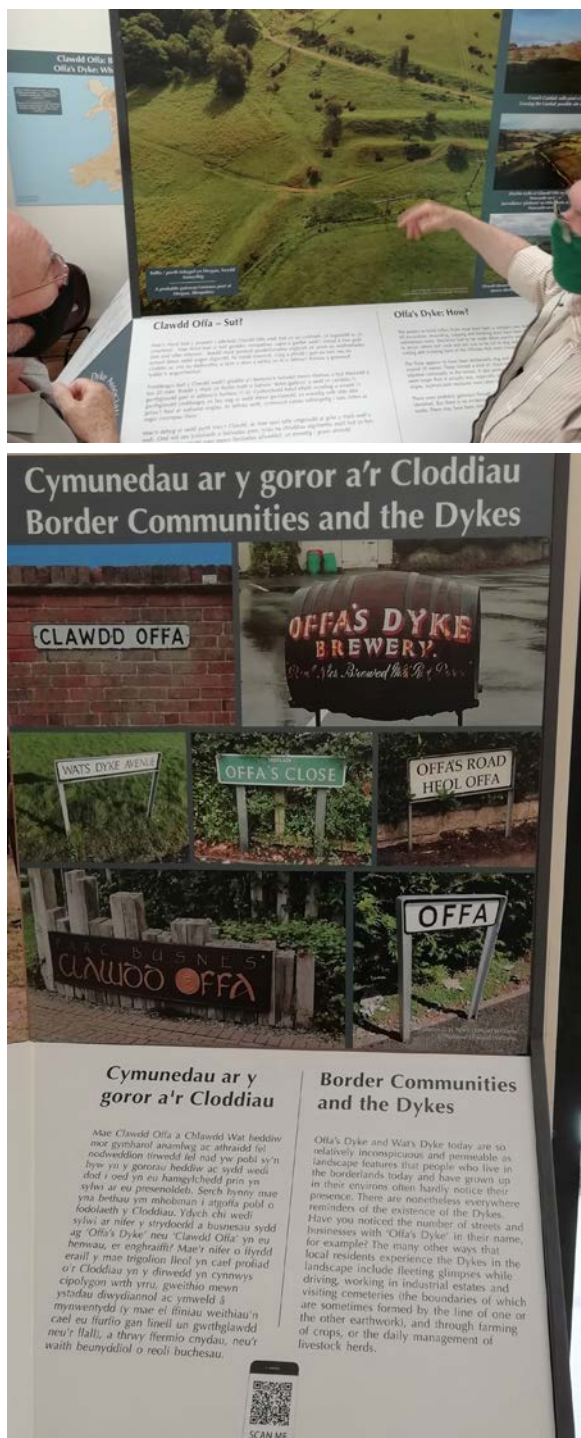


Figure 1: The new exhibition in the Offa's Dyke Centre. 1a (above): Julian Ravest (left) and Professor Keith Ray (right) discuss the exhibition including a drone photograph of Hergan Corner (Clun Forest, Shropshire) by Ravest. 1b (below) the 'Border Communities and the Dykes' featuring photographs by Howard Williams (Photographs: Howard Williams)

the Offa's Dyke Association. This exhibition is not formally open and so I will refrain from a detailed review here. Still, it is necessary to commend the wealth and detail of information it contains through its text and images, including the latest research and ideas about Offa's Dyke and Wat's Dyke. The displays tell the story of the monuments from the Early Middle Ages but also their significance today. The aim is for the formal launch of the exhibition by Easter 2022, but those who attended the Offa's Dyke Path's 50th anniversary celebrations (see below) had a brief opportunity for a preview (Figure 1a and b).

Another heritage initiative derives from the collaboration of archaeological illustrator John G. Swogger and HW: the 'What's Wat's Dyke? Wrexham Comic Heritage Trail. Initially launched in July 2021 in English as part of the Council for British Archaeology's (CBA) Festival of Archaeology (Williams 2021h) and the Welsh medium version, was subsequently launched in December 2021, translated by Dave Andrews (Williams 2021i).

New heritage interpretation panels funded and designed by



Figure 2: The new carved bench (left) and interpretation panel (right) on Offa's Dyke at Home Farm, Chirk Castle (Photographs: Howard Williams)

other organisations also feature the latest developments of the heritage interpretation of the Anglo-Welsh borderland landscapes. The National Trust's efforts to interpret Offa's Dyke at Chirk Castle (Figure 2) follow a critique by HW in 2016 regarding the complete absence of heritage interpretation for visitors (Williams 2015). Meanwhile, the new heritage interpretation board in the Greenfield Valley on Wat's Dyke (Figure 3) has appeared subsequent to HW identifying the limited interpretation of the monument here and elsewhere along the monument's line (Williams 2020). Both interpretation panels have received critical review on the Offa's Dyke Collaboratory blog (Williams (2021j–k).



Figure 3: The new interpretation panel for Wat's Dyke at Strand Coed, Greenfield Valley, Holywell, already subjected to graffiti (Photographs: Howard Williams)

A further topic of reflection relevant to the Collaboratory was the relatively small-scale but intense controversy following a tweet by English Heritage on 3 October 2021



Figure 4: The logo for the 'Walking with Offa' exhibition by Dan Llywelyn Hall (Photograph: Howard Williams)

from the Tidenham stretch of Offa's Dyke at the Devil's Pulpit which failed to mention the view was ostensibly of Wales and including the Cadw site of Tintern Abbey. Reflecting on the challenges of digital engagement and on-site heritage interpretation, Williams (2021l) evaluated the digital reactions, the missed opportunity of this instance for education and engagement regarding the significance of Offa's Dyke, as well as the ongoing challenges of political discourses vying over the

meaning and significance of the monument and its landscape context.

Collaboratory convenors have also contributed in the media, including Keith Ray being quoted in *The Guardian* regarding Offa's Dyke (Rushby 2021). Meanwhile, HW and Collaboratory member Mel Roxby-Mackey were among those who appeared on the ITV Wales 'Wonders of the Border' television programme hosted by Sean Fletcher exploring the Wales-England border and following the Offa's Dyke Path from south to north. Filming in September 2019 at Lippets Grove near the Devil's Pulpit in Gloucestershire, HW talked about Offa's Dyke's function and significance in episode 1 (Williams 2021m). It is also important to note the range of talks by Collaboratory convenors including Dr Paul Belford regarding Clwyd-Powys Archaeological Trust's latest work on prehistoric hillforts and linear earthworks, disseminated online (Belford 2021; see also Williams 2021n) as well as HW exploring the 'wall that made Wales' on History Hit's *Gone Medieval* podcast (Williams 2021o).

Engaging the public face-to-face was not completely foregone during 2021. For instance, Collaboratory member Ray Bailey gave guided tours through the Greenfield Valley stretches of Wat's Dyke to coincide with the CBA Festival of Archaeology. Notably, 2021 was the year of the 50th anniversary celebrations of the Offa's Dyke Path, and this involved not only long-term digital profile-raising videos and digital activity by the National Trail, but also a memorable day of events and activities at the Offa's Dyke Centre at Knighton on 10 July 2021 (Offa's Dyke Association 2021). The day was marked by a series of artistic and creative interactions with the monument and the long-distance national trail, including a memorial walk, music and poetry as well as a viewing of Dan Llywelyn Hall's artworks inspired by the monument: 'Walking with Offa' (Figure 4; see also the front cover illustration of the commemorative stained glass window unveiled on this day). This event coincided with



Figure 5: The 50th anniversary logo on the memorial bench on Panponton Hill, Clun Forest, Shropshire (Photograph: Howard Williams)



Figure 6: The new memorial plaque appended to the monolith at Pinners Hole to commemorate the 50th anniversary of the Offa's Dyke Path National Trail (Photograph: Howard Williams)

the publication of a new book of poetry and art to commemorate the anniversary (Hall *et al.* 2021). As well as anniversary way markers being fixed along the Path (Figure 5), a new plaque was appended to the memorial stone marking the opening of the path at Pinners Hole adjacent to the Centre (Figure 6; see Williams 2021p for a review).

Together, these events and activities show the host of the Collaboratory is working alongside a host of organisations and individuals in creative, culturally engaged ways to explore linear monuments and former frontier. Significantly, these involve communities living in their shadow and visitors alike as well as interacting with wider political discourses.

Weathering a storm of crises

The Collaboratory has endured through multiple interleaving crises during 2021. By way of conclusion I would like to end by reflecting on these dimensions in considering the future of the research network.

Set against the background of the ongoing global COVID-19 pandemic and its socio-economic, political and health challenges, exacerbated by the climate crisis and the ongoing ramifications of Brexit, British archaeology has faced a series of specific threats over this past year. Issues include

reduced museum funding and closures, strained and reduced national, regional and local government support for archaeology, as well as the commercial sector facing employment shortages, poor levels of pay, a raft of issues regarding working conditions and the threat of new planning legislation. Across UK academia, but especially the humanities, leading experts are losing their jobs and well-respected and long-term research and teaching units in Archaeology and History are being cut and closed, including archaeology programmes at the University of Sheffield and the University of Worcester.

These threats are all taking place within a growing 'culture war' regarding how the British landscape is conserved, managed and interpreting for current and future generations. The National Trust in particular has been embroiled in debates over its attempts to recognise the colonial legacies of its properties (e.g. Thorpe and Tapper 2021). This is interleaving with the aforementioned impact of Brexit, the climate crisis, a continued immigration crisis, growing nationalism, and a time when concepts of race and ethnicity, nationhood and the countryside are foci of intense debate and politicised rhetoric. This has created a powder keg situation regarding the mobilisation of ancient borders in contemporary political discourse. For example, in a speech at the COP2020 summit, UK Prime Minister Boris Johnson explicitly and falsely framed the climate crisis as a threat of uncontrolled immigration akin to the supposed fate of the Western Roman Empire (Cunliffe 2021).

Select aspects of these challenges are briefly reviewed in *British Archaeology* magazine 180 for September and October 2021. The front cover question identifies a gloomy situation: 'Who would be an archaeologist?' and 'The crisis facing the profession'. Mike Pitts' editorial identifies 'a sense of doom has been spreading over archaeology like a plague' (Pitts 2021). Within, the article 'What future for archaeology in Britain?' sketches the popular appeal for archaeology and the challenges we face. Leading names in archaeology and cognate disciplines lend their names to the value of the discipline (Duckworth 2021).

Superficially, it seems that UK archaeology is stepping up to these daunting challenges. However, it remains unclear whether archaeologists and cognate disciplines can 'work together with a common vision' (Duckworth 2021: 34). Indeed, there have been efforts from within to curtail campaigning for the academic discipline's future (thePipeline 2021; Williams 2021q). As such, the UK academic archaeology sector's future remains uncertain and lacking an agreed singular vision and public strategy to advocate and campaign for its own existence. In this situation, the future of academic input into initiatives such as the Offa's Dyke Collaboratory is uncertain.

How does all these circumstances directly pertain to the Offa's Dyke Collaboratory and the future of this journal? Three simple points. First, in the current political and socio-economic context, never has detailed interdisciplinary research about Britain's past in comparative perspective been more urgently required. This includes rich, informed and critical evaluations of linear earthworks and their frontier and borderland contexts. Second, equally, never has it been more important to sustain an open-access academic resource as a venue dedicated

to exploring the complex story of frontiers and borderlands from prehistory to the present-day to inform academic debates but also public discourse. In this contemporary whirlwind of crises, the enduring ancient banks and ditches of dykes silently look on, some forgotten, some half-remembered, but some increasingly drawn into the fray as debating tools and sometimes as weapons. The Collaboratory has a pivotal role in informing and challenging misuses of linear monuments in contemporary society. Hence, third and finally, this work cannot continue if there is not support for it within and beyond the archaeology and heritage communities and associated stakeholder communities. The research network's labour and endeavours certainly cannot proceed in a never-ending climate of toxicity and hostile attacks on the humanities in general, and archaeology in particular. We stand on a precipice, on a linear, looking out over various and uncertain futures. For now, however, the Offa's Dyke Collaboratory shall endure and endeavour to overcome.

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Patrons, Landscape, and Potlatch: Early Medieval Linear Earthworks in Britain and Bulgaria

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Often seen as exceptional monuments, comparative analyses of linear earthworks are rare. Exploring Offa's Dyke (Wales and England) and the Erkesiya (Bulgaria) as comparable expressions of authority in the early medieval landscape. This article is a revised and updated republication of an early study (Squatriti 2001), arguing that both linear monuments represent strategies to not only reflect, but actively create, royal power.

Keywords: Bulgarian Empire, Erkesiya, Offa's Dyke

Who built the seven gates of Thebes?
The books are filled with names of kings.
Was it kings who hauled the craggy blocks of stone?

Brecht (1977: 109)

Nowadays we imagine the only thing Britain and Bulgaria have in common are the sunburned British tourists who throng the Balkan nation's Black Sea resort towns in summer. But despite the superficial modern impression of difference and disconnection between the two countries' past and present, in the Early Middle Ages remarkable synergies and similarities existed. For instance, both the Anglo-Saxon kingdoms and 'protobulgar' Bulgaria were occupiers of former Roman territories administered by barbarians whose settlement there provoked fairly minor social changes. Both the Bulgars and the Anglo-Saxon kingdoms, however, managed to sustain a separate cultural identity much longer than most barbarians who found themselves within the Roman *orbis terrarum*. While very minimal vestiges of Frankish, or Vandal, or Gothic cultural production survive, from both Bulgaria and lowland Britain we have a respectable corpus of literature in the settlers' language, a sign of the tenacity of their culture after centuries of slow Romanization. Latin and Greek became widely used as languages of power only after conversion to Christianity among the Bulgars (in the ninth century) and the Anglo-Saxons (in the seventh century). Unlike other barbarians, Bulgars and Anglo-Saxons were slow to adopt Christianity, clinging to pagan cultural models far longer than most folks in the 'Volkerwanderungen.' Even khans who were open to Byzantine cultural influence used the rather inscrutable, steppe-derived pagan calendar in official documents, while Anglo-Saxon poets, though they lived in Benedictine monasteries, populated their compositions with entirely credible pagan figures. Moreover, the mechanics of the two conversion processes are aligned. Indeed, England and Bulgaria's Christianisations have been studied comparatively by no less a scholar than Henry Mayr-Harting, for whom the mid ninth-century conversion of

the Bulgars is a clear mirror in which to glimpse how conversion worked in Britain during the 600s (Mayr-Harting 1994).¹ Nor is Mayr-Harting the first to stress the similarities between English and Bulgar experiences in the postclassical centuries. Already in the 860s, in Rome, far removed from the Balkans and the Channel, the polymath Anastasius the Librarian observed that papal policies deployed in seventh-century England would fit perfectly in the context of contemporary Bulgaria.² Some early medieval people were as conscious as some late twentieth-century ones of the similarities and comparability of Mercia and Bulgaria in the Early Middle Ages.

The point, then, is that Bulgar khans and Anglo-Saxon kings are far less unlikely bedfellows than one might think. During the Early Middle Ages, the geographical distance between the extremities of the European East and its West was bridged by a surprising series of historical parallels. A further unsuspected similarity between the two places on the fringes of Europe, and one which will occupy us here, is the willingness of the early medieval rulers of these places to effect large-scale landscape transformations. Both geographically and chronologically, the lowland Britain of Bede and *Beowulf* and the Bulgaria of the khans who worried Byzantium are far from sixteenth-century Tuscany. Yet just as in Medicean Tuscany 'ambitious new architectural and engineering projects were started all over the region,' where 'building activity [was] directed at supporting and glorifying the prince, [and] reinforced political and artistic control from the centre,' so too in postclassical Bulgaria and Britain major building projects in rural areas added to the rulers' authority (von Henneberg 1996: 24).

To achieve this goal, the rulers conspicuously consumed resources in a way reminiscent of the potlatches that the First Nations of British Columbia arranged on occasion, well into the twentieth century. Indeed, Anglo-Saxon and Bulgar rulers consciously used landscape and alterations of it as marks of rulers' authority, or what German scholars quite intimidatingly call 'Herrschaftszeichen.'³

The particular form of landscape change which will occupy our attention here is the digging of ditches (Squatriti 2002). There are remarkable affinities between the early

¹ This represents a departure from older scholarship, like Sullivan (1966: 56, 138) for whom Bulgaria's experience is unique.

² Anastasius Bibliothecarius, *Epistulae* 5. Since two of pope Nicholas' famous *Responsa* (letter 99) to the inquisitive neophyte khan Boris refer to the English precedent (items 64 and 68), it seems that in ninth-century Lateran circles the similarities of Bulgar and Anglo-Saxon circumstances were widely known (St Boniface's experience in Germany was also held to be relevant in Bulgaria; see Mayr-Harting 1994: 16; Sullivan 1966: 128–129). Angenendt (1986: 749–754) sees in the strategy of leaving a royal son pagan (in English and Bulgar cases) a sign of comparable difficulties for rulers in making the transition to Christianity.

³ This is an expansion to the canonical list of medieval *Zeichen* (thrones, crowns, scepters, coins, clothes, jewels, and relics; Schramm 1954–1956). Pferschy (1989) treats buildings in the same way I wish to treat ditches, as barbarian rulers' claim to authority.

medieval efforts to build monumental earthworks in central Bulgaria (Thrace, at the time of construction) and the Welsh Marches (then known as Mercia) (Figure 1). To begin with the English case, in the second half of the eighth century (scholars are unsure about exactly when),⁴ on the western fringe of the Anglo-Saxon kingdom of Mercia, then at the apogee of its power, a large-scale fosse was excavated, known today as Offa's Dyke. It extends along the foothills of the Cambrian mountains of Wales in a north-south line between Liverpool Bay in the Irish Sea and the Severn river's estuary some 240km further south. Recent archaeological discoveries prove that the medieval belief in Offa's authorship of the entire bulwark was misplaced. He seems to have had about half the dyke dug (Worthington 1999: 341, but see now Ray and Bapty 2016). Meanwhile, the northern dyke, 'Wat's Dyke' may have arisen in the mid-fifth century (Hannaford 1999; but see also Malim and Hayes 1998). Generally, the trench is some 2m deep, but it spans up to 6m from bottom of ditch to top of bank in places. It was made by piling the fill up on the ditch's east lip, and the resulting embankment is at least 2m high. The whole structure averages 20m in width (Fox 1955: 44, 78, 277; Hill 1985).

In the most desolate, unagricultural, highland stretches, where it is best preserved (e.g. across Clun Forest), the height and depth of Offa's Dyke still attains monumental scale, forming a bold landmark (Figure 2). Yet, it is prudent to recall that where the earthwork is now abraded and visually softened, in the eighth century it was highly noticeable. Britain's local historians, brandishing palynological and place-name studies, depict the early medieval west Midland landscape as lightly wooded and heavily humanised (Davies 1982: 11–12; Gelling 1992: 6–19; Rackham 1994: 7–8; Tyers *et al.* 1994: 12–22). Whereas Sir Cyril Fox, first and most glorious surveyor of Offa's Dyke in the 1920s and 1930s, opined that jungle-like woods engulfed portions of the monument's trajectory (as he nicely put it, 'damp oaken forests'), pollen analysis indicates increased agricultural activity at early medieval sites around the Dyke (Fox 1955: 207; Everson 1993: 53–59; Dark 1996: 32–33, 37–38, 40–44, 46–47). Eastern Cheshire and northern Warwickshire had clusters of thick woods, or so suggest groupings of place-names with the *-leah* ending, but the monument shied from them. Offa's Dyke traversed land dedicated to growing grains, pastures, and open moorland, where stands of oak, birch, and hazel were managed and exploited.⁵ In some portions of the earthwork where excavation has been tried, charcoal has indicated that vegetation was burned off before digging began (Hill 1977: 29; Wormald 1982: 121). Though within a season or two plants must have recolonised the raw earth exposed by diggers, and attenuated the chromatic impact of the earthwork, this was a highly legible, visible feature in the early medieval landscape. It was unmistakable from both sides of the embankment along most of its course, and the Anglo-Saxons, fine connoisseurs of protuberances in the soil who distinguished by

⁴ Scholars agree Offa built it, on Asser's authority. But though some think it was built in Offa's later, more secure years, there is no certainty (e.g. Stenton 1971: 214–215; Gelling 1992: 102).

⁵ On *-leah* endings as a topographical indicator in the area of Offa's Dyke, see Gelling (1992: 6). Squatriti (2004) analyses the dyke's environmental impact.

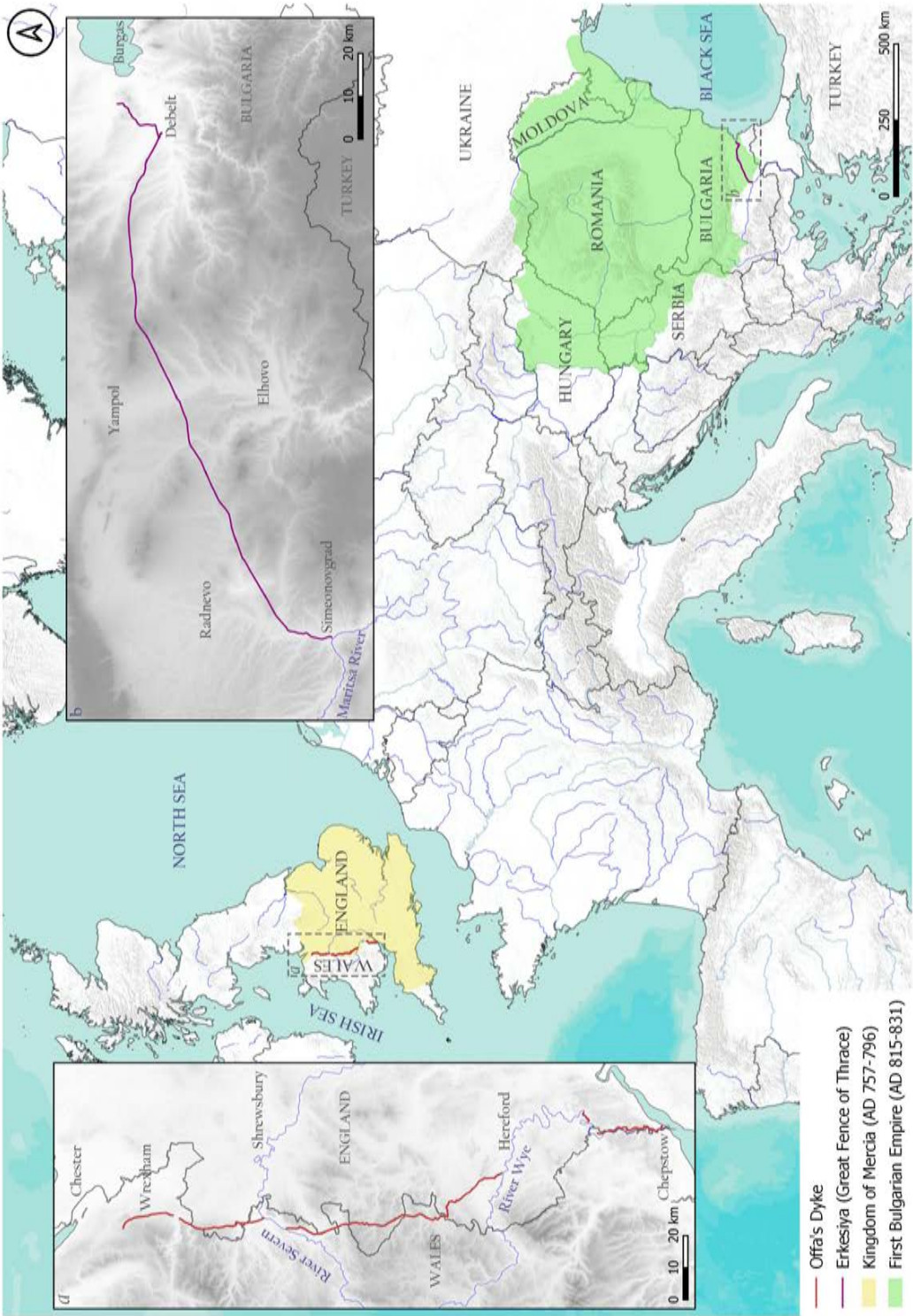


Figure 1 (opposite): The location of Offa's Dyke in relation to Mercia at the kingdom's greatest extent of hegemony under King Offa at the end of the eighth century AD and Erkesiya in relation to the Bulgarian Empire in the early ninth century (Map by Liam Delaney)

shape between a half dozen types of mound, would never overlook it (Hooke 1998: 3–5). Even when winter fogs enshrouded the low-lying sectors, the earthwork remained as sensible to the legs as it was, in clear weather, to the eyes.⁶

Far to the east of Mercia, within a generation of the completion of Offa's Dyke, another monumental ditch was dug in Bulgarian Thrace. What the Ottoman Turks called the Erkesiya, and what John Bury (1910) rechristened the Great Fence of Thrace, is a 130km linear earthwork from near the Black Sea port of Burgas along an east–west line to near the town of Simeonovgrad on the Maritsa river. Today it is severely eroded, the ditch seldom reaching deeper than one metre, with the embankment along its north lip about a metre high (thus, Bury's Fence was 'south-facing') (Figure 3). The 'Fence' is generally about 15m wide (Rasev 1982: 122–123; Soustal 1986, 150–152, 1991: 84, 261–262). It crosses lands of mixed relief, from the coastal plain to the southern foothills of the Balkan mountains (Soustal 1986: 151–152; see also Bury 1910: 276–281). The landscape through which the Erkesiya delves was, judging from literary and archaeological evidence, mostly farmland, with some vineyards mixed with woodland and open moors, in the postclassical period (Besevliev 1981: 1–5; see also Howard-Johnston 1983: 242–243; Poulter 1983: 90–101; Henning 1987: 35–40, 51–53; Randsborg 1991: 61–64). The almost treeless terrain of the eastern section of the Erkesiya contrasted somewhat with the Balkan piedmont, which was enough of a wilderness to provide a tenth-century Byzantine emperor with an excuse for returning thence to Constantinople with his army, instead of invading Bulgaria; but even there forest cover was patchy and interspersed with human structures.⁷ Hence, the 'Fence' was visible from afar, as well as from up close. This new, artificial landscape feature was, like Offa's Dyke, an ostentatious, unmistakable innovation in the territory.

Beyond the simple facts of their almost simultaneous construction, their technical similarities, and their visibility in the land, Offa's Dyke and Erkesiya share something else: both developed an early medieval reputation. By noticing, talking, and writing about these earthworks, early medieval people added another dimension to the ditches' prominence as landscape features, the dimension of memory. In the case of Bulgaria, whose culture was predominantly oral before the tenth century, one of the earliest

⁶ See Davies (1982: 6) on lowland fogginess. Transhumant shepherds and herders would have 'noticed' Offa's Dyke twice a year as they sought greener pasture.

⁷ Rasev (1982: 233–234) suggests that Bulgar ramparts adapted to the terrain they crossed (turves, earth, and wood alternated according to availability): if so, then the 'Great Fence's' builders found little woodland on which to rely, for they used only earth. See also Leo the Deacon, *Istoria* 4.5 (62–63).



Figure 2: Offa's Dyke looking north across the Clun Valley, Shropshire (Photograph: Howard Williams)

surviving Bulgarian texts refers to ditch digging by glorious rulers, which is suggestive of the centrality that activity enjoyed in Bulgarian culture.⁸ The early eleventh-century Vision of Prophet Isaiah credits Asparuch, the khan who in 681 first settled the Bulgars in what would become Bulgaria, with the excavation of a giant ditch in the Danube delta. In the eighth century, long before the Christian missionaries brought their alphabet, some khans began to use Greek to inscribe accounts of their deeds on stone pillars and in other official texts. One such pillar, fragmentary but extant (Figure 4), by chance records the Bulgar side of a treaty made with Byzantium in 816, and seems to refer to the Erkesiya. The inscription claims khan Omurtag 'established' his southern border with Byzantium along a line corresponding closely to the one Bury's 'Fence' follows.⁹ The pillar represents the ditch as a trophy of the khan, a sign of his prowess

⁸ The text is in *Bogomilski Knigi i Legendi*, with the pertinent chapter 3 on p. 282. *Visio Isaiae* is translated by Besevliev (1981: 499–500) and Petkanova (1979: 190–196). See Giambelluca Kossova (1983: 167–173) for background on its composition. Gjuzev (1984: 43–44) gives reasons for believing the *Vision* of Asparuch.

⁹ Fine (1983: 100, 106) claims 'the old frontiers' were restored and the 'Balkan mountains became the frontier again.' Bury (1910) was the first to connect the earthwork to the treaty inscription, and has been almost unanimously followed since (e.g. Besevliev 1981: 477–478). The inscription's text is in Besevliev (1960, n. 41, 190, with commentary at 192–206). For an additional useful commentary, see



Figure 3: Erkesiya (reproduced from vici.org: <https://vici.org/vici/35331/>)

and appropriate wielding of power.¹⁰ Early medieval observers outside Bulgaria agreed with Omurtag's evaluation of the earthwork. The Erkesiya entered the historical record in the account of the Byzantine chronicler Skyltizes, writing shortly after 1050, as a basic feature of Thrace's landscape in the 960s. In the tenth century, al-Masudi also singled earthworks out as the most significant monument in Bulgaria south of the Danube.¹¹ In the generations after Omurtag, landscape change ignited the historical imagination of Bulgaria's neighbours. Following Omurtag's triumphal inscription, the ditch had developed a set of cultural and political associations.

There survives no official Mercian inscription as plausibly related to the construction of Offa's Dyke as Omurtag's inscription is with the Erkesiya. Indeed, though Offa, the king of Mercia in the second half of the eighth century, worried about his posthumous fame and supported monasteries where history was written, almost all Mercian records have vanished, victims of the Vikings (see Jackson 1963: 22–23). The later, Wessex-inspired Anglo-Saxon Chronicle lists Offa's campaigns against rival rulers and his pious

Besevliev (1962: 11–12, 20). Treadgold (1984: 213–220) redated the treaty.

¹⁰ A trophy literally: the inscription was (evidently) kept at the royal palace in Pliska. Omurtag was innovative in his conscious use of building programs to assert parity with Byzantine emperors: palaces, bridges, and pillars claiming authority from God (*à la byzantine*) are known (Rasev 1983: 263–265; Besevliev 1981: 287–288; Stancev 1964: 347–349).

¹¹ Skyltizes, *Synopsis* 20 spoke of a 'megale taphrou.' see Al-Masudi, *Le livre*: 248). Omurtag's use of structures to communicate with foreigners is evident in another inscribed pillar now in Turnovo, but once at Pliska, about his erecting a residence on the Tica river 'displaying his power to the Greeks and Slavs' (Besevliev 1960: n. 56, 260). On his use of titles to claim parity with Byzantine emperors, see Besevliev 1971: 86–90.

patronage of religious houses without mentioning any construction activities (Keynes 1998: 39–45). But Asser, the Welsh biographer of King Alfred, writing less than a century after Offa's death, confidently ascribed the great embankment 'from sea to sea' to Offa, a king he disliked and characterised as an imperialistic bully ('*universis circa se regis et regionibus finitimis formidolosus rex*').¹² Asser and his Welsh audience were sensitive to the origin and meaning of the monument, and this attribution of its authorship was embraced by later Welsh writers (for instance in the *Brut y Tywysogion*: Williams 1860: 9).¹³ Nor were the literate alone in noticing, discussing, and attributing the earthwork. For at least 1000 years it has been called Offa's Dyke in both Welsh (Clawdd Offa) and English (Offa's Dyke). The popular association of formidable kingship and imposing ditch is further confirmed by the many pre-Norman place-names along the course of the Offan monument that allude to the king.¹⁴ Offa's Dyke made as deep an impression on the early medieval imaginations of the Welsh and the English as it did on the soil. The long trench inscribed royal hegemony on the topography. The ditch was a living testimonial to a king who otherwise risked becoming just like dozens of other Anglo-Saxon hegemony with odd, now unpronounceable names: quaint and forgotten. Frank Stenton, who thought Offa 'at once the most important and the most obscure of early English kings,' considered the monument 'the greatest public work of the whole Anglo-Saxon period' and precious evidence of Offa's political might. He was, in effect, continuing a historiographical tradition (Stenton 1970: 62; 1971: 212).

Thus, Omurtag's 'Fence' and Offa's Dyke became effective, long-term advertisements of rulers' authority. Such efficacy derived from their visibility, from the flagrant, enduring changes they made upon the landscape, changes which were impossible to ignore. But if the ditches enjoyed a second life in the minds of later people, it was contemporaries who constituted the primary audience for Omurtag and Offa. Longsighted as they may

¹² The phrase '*a mari usque ad mare*' was used by Bede (*Chronica*: 515)) to describe Roman walls in northern Britain, and by the *Historian Brittonum* to describe Celtic settlement in Britain. Asser (*Alfredi* 14) adopted it to signal the dyke's (imaginary, as about 70km of the 240km seem not to have been built) completeness. On Asser's opinion of Offa, see Scharer (1996: 205).

¹³ See Keynes (1998) for a subtle reconstruction of Asser's milieu (to me, that Asser was not a Ramsey Abbey forger living c. 1000 is still the safest position: see Nelson 1998: 115–124). The reputation earthworks could create for themselves is exemplified in the fact that in the 500s Britons living far from Rome's linear defences in north Britain knew, thought, and (in the case of Gildas) wrote about these structures (Higham 1991: 1–5). Bede (*Hist. Ecc.* 1.5, 1.12) too, who lived closer to the Roman walls, cared about them and demonstrates how early medieval people preserved stories about these idiosyncratic monuments.

¹⁴ See Hill (1977: 312) on 'Offan' place-names. Omurtag's name was not attached to the Thracian soil in this manner, though attaching names of the mighty to places was a known practice (victorious Byzantine rulers liked to rename sites in Bulgaria after themselves or relatives: Preslav became Ioannoupolis in 976 and Preslavitzza became Theodoroupolis (Jordanov and Tapkova-Zaimova 1988: 19, 120) while Pliska became Nicephoropolis in 811 (Fine 1983: 96).



Figure 4: The pillar with the treaty inscription of AD 816 claiming khan Omurtag established the Erkesiya (after Curta 2019: 22, fig. 2.3, reproduced with permission)

have been, the Mercian king and Bulgar khan were also pragmatic men enmeshed in difficult, contested political situations for whom the momentary, immediate impact of digging the vast trenches was vitally important. Indeed, the spectacular nature of the process of excavation was central to the manifestation of rulers' power which landscape change achieved.

For the actual digging of the gigantic ditches was truly a spectacle. Mercian (and Welsh) or Bulgar (and Byzantine) societies beheld in the excavation how much control over land and people Mercian kings or Bulgar khans exercised. For Omurtag and Offa, the months of construction were a moment of triumph, a brief time during which they carried out in practice the kind of control which at other times remained theoretical. Today, in totally different demographic and technological circumstances, we are accustomed to public works projects on a gargantuan scale, to states fully capable of mobilising many thousands of labourers and machines in order to build highways, dams, border surveillance systems, and the like. But as the Medici lords of Cinquecento Tuscany knew all too well (or realised each time they pondered large tasks like draining the Maremman marshlands), things have not always been so. Organising systematic work on the staggering scale necessitated by the Erkesiya or Offan dyke was a heroic

achievement in postclassical Europe: it is sobering, in this regard, to consider that 'Britain's leading motorway contractors threw up their hands in despair when... asked to cost (Offa's Dyke) today,' namely in the 1980s, and eventually concluded fifty million pounds sterling might suffice, though none of them considered such a project viable for their own company: such sums were unimaginable forty years ago.¹⁵ Surveying, designing the trajectories to be followed (disregarding local, traditional systems of land ordering), summoning the diggers, organising the work, providing equipment, and furnishing food and shelter so as to make it possible to move millions of tons of soil make the minimal list of difficulties which Offa and Omurtag overcame so spectacularly (see Grigg 2018: 63–83; Ray 2021).

Given the small populations of the West Midlands or northern Thrace in the early Middle Ages, given the very limited taxation rights of rulers, their limited ability to extract work from subjects, and their ongoing need to negotiate the terms of their authority with the aristocrats of the two realms, imposing some months of forced labour on several thousand peasants and conscripting slaves and prisoners to dig a vast furrow, the completion of such earthworks was an important political statement.¹⁶ Neither Offa's Dyke nor the Erkesiya was a credible military barrier, and neither lay on the border of Mercia or Bulgaria, so the political statement seems to have been the ditches' main purpose. For both Offa and Omurtag the ability to marshal and organise the resources which their earthworks represented was a mark of their legitimacy and authority. The fact that the ditches did little beyond represent, whether to the diggers themselves or to all contemporaries who saw or heard about the ventures, added to their impact. Rather like the Chinook of the American Northwest, whom Franz Boas famously portrayed as willing to 'waste' their resources very publicly so as to inform their peers and subalterns of their power and wealth, early medieval Bulgar and Mercian

¹⁵ Other bulwarks like the Ming period Great Wall of China or Hassan II's 450km sand embankment against Polisario had the advantage of crossing almost uninhabited wildernesses. For modern British data, drawn from a BBC television program, see Smith 1988: 26 (my thanks to Luisa Squatriti for this reference). Recent efforts to assess the labour invested in Offa's Dyke are in Grigg, 2018: 63–83, and Ray 2021.

¹⁶ Hill 1985: 140–142, using the Burghal Hidage of 917, reconstructed the schedule of labour in Mercia, suggesting two springs were sufficient to Offa. On English kings' labour appropriations, see: Brooks 1971: 69–84; Hollister 1962: 59–62; Hodges, 1989: 88). On the prevalence of small, self-sufficient farms in early medieval Bulgaria, see Henning 1987: 30–37, 40–41. Bulgar peasants served in the army, though unwillingly (to judge from the draconian punishments envisioned for the lackadaisical in Pope Nicholas, *Responsa* 22–23 and 40). On military arrangements see Browning 1975 114–134; Besevliev 1981: 347–354. Desertion was an acute concern for both Omurtag and his predecessor Krum (Besevliev 1981: 262; Bury 1912: 360). On forced labour in Bulgaria, see Browning 1975: 48, 51, 86, 112, 114; Gjuzeev 1988a: 50, 1988b: 87; Shepard 1988: 171–172. Slavery existed in both England and Bulgaria during the early Middle Ages, but it is difficult to establish its importance for the economy generally and the ditches in particular.

lords invested conspicuously in ditches (Mauss 1923–1924: 39, 95–96, 152–157, 167–174; SchulteTenckhoff 1986). Byzantine and Welsh neighbours, along with Bulgar and Mercian audiences, witnessed this earthy potlatch, and must have been duly impressed, as the immediate historical fame of the structures suggests. In fact, the ability of Omurtag and Offa to ‘waste’ their time, their often-challenged rights over other people’s work, and the endless logistical supports digging the dykes required, was central to the renown of these potentates. Stranded in the piedmont countrysides of the Cambrian and Balkan mountains, the great furrows presented an enduring reminder of these early medieval potlatches and the power behind them.

Instead of thinking about Bulgaria’s and Mercia’s large-scale earthworks as unique military installations to secure borders, therefore, we can appreciate their significance as landscape features by realising how much they had in common.¹⁷ The Dyke or ‘Fence’ slicing through humanised rural settings had a monumental quality which was appreciated by early medieval people. Traces on the earth like these had unmatched suggestive grandeur, and implied to contemporaries, not to mention later generations, something of how mighty men were, or had been, able to refashion the environment in which all lived. These were obviously laborious structures which served no clear purpose. The completion of the superfluous projects signalled the rulers’ status, their capacity to amass, order, and consume resources. Such prodigality could serve to warn hostile or recalcitrant neighbours. Rulers like Omurtag and Offa also found in ditch-digging a rare chance to actualise the kind of relationships between ruler and ruled which lay dormant during most of their lifetimes. Around 800, constructing earthworks was truly the bellows in the forging of the monarchy. The patronage of building projects that changed the physical appearance of the landscape reinforced and indeed created monarchical power.

In sum, dyke-making illustrates how close the experiences of barbarian ‘successor states’ like Bulgaria and Mercia could be, and shows that eastern and western Europe shared a great deal in the centuries after the fall of Rome. On the shores of the Irish Sea as on those of the Black Sea social, political, and cultural developments had a striking similarity. Whether on the western fringe of the early medieval West or on the northern edge of the Byzantine oikumene, ditches served symbolic purposes both for the powerful who originated them and for all observers, within and outside of Mercia and Bulgaria, who wondered about the place of humans on the surface of the earth.

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¹⁷ The earthworks have always been considered military structures (e.g. Higham 1995: 140; Kirby 1991: 164; Runciman 1930: 73, 288–290; Browning 1975: 51) or border markers (Skorpil 1931: 30; Fox 1955: 28, 44, 218; Hart 1977: 53; Hill 1977: 22; Davies 1982: 110; Hodges 1989: 144; Soustal 1991: 151;).

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Offa's Dyke: A Continuing Journey of Discovery

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Dick Finch, Niall Heaton, Jon Hoyle and Simon Maddison

New observations concerning the Mercian/Welsh frontier, principally on Offa's Dyke (but also on Wat's Dyke and in the Vale of Chwyd), were made each winter between 2016/17 and 2019/20 by the lead author with, at one time or another, each of the collaborators in this article. The prime focus here is upon Offa's Dyke in west Gloucestershire and in Flintshire, in both of which areas fieldwork is adding incrementally to our stock of knowledge about the extent and nature of the monument. However, observations elsewhere on its course, such as in west-central Herefordshire, at Hem (Montgomeryshire), and near Trefonen (Shropshire) are also noted in brief descriptive sections. The identification of 'new' lengths of Offa's Dyke in Tutshill (near Chepstow) and between Lower Redbrook and Lower Lydbrook south-east of Monmouth indicates that the linear earthwork was built as a near-continuous or continuous monument in these southerly areas. Meanwhile, the discovery of lengths of linear earthwork in Flintshire that could have formed part of a continuous course reaching the sea near Gronant east of Prestatyn has also raised important questions about the relationship of Wat's Dyke to Offa's Dyke.

Keywords: fieldwork, Offa, Offa's Dyke, survey

Introduction

The book *Offa's Dyke: Landscape and Hegemony in Eighth-Century Britain* (Ray and Bapty 2016) argued that Offa's Dyke was both a physical and a political monument, one component of a broader 'march land' frontier, paralleled on the Continent by the Kingdom of the Franks under their charismatic leader Charlemagne. The Dyke was carefully placed in the landscape with the twin objectives of maximising its visibility when seen from the west and realising its surveillance potential from the Mercian side. Furthermore, by noting the recurrence of specific *construction* forms and methods, a more consistent and intricate understanding emerged of the character of the monument wherever it is to be found. Features that had been considered anomalous or the result of badly executed building practices were revealed instead to have been carefully planned. The Dyke was a sophisticated piece of engineering, designed and executed with a keen eye for strategic advantage, even in areas where at first glance it seems poorly sited (Ray and Bapty 2016: 122–251).

Offa's Dyke should be understood also as a demonstration of Mercian power and the ability of that hegemonic kingdom to plan and deliver major public works. That this was an example of the political ambitions of King Offa himself is probably reflected in the fact that, even a century on from its construction, his name and the monument were inextricably linked even in the minds of members of the otherwise antagonistic West Saxon court of King Alfred (Keynes and Lapidge 1983: 71). The Dyke, like Offa's

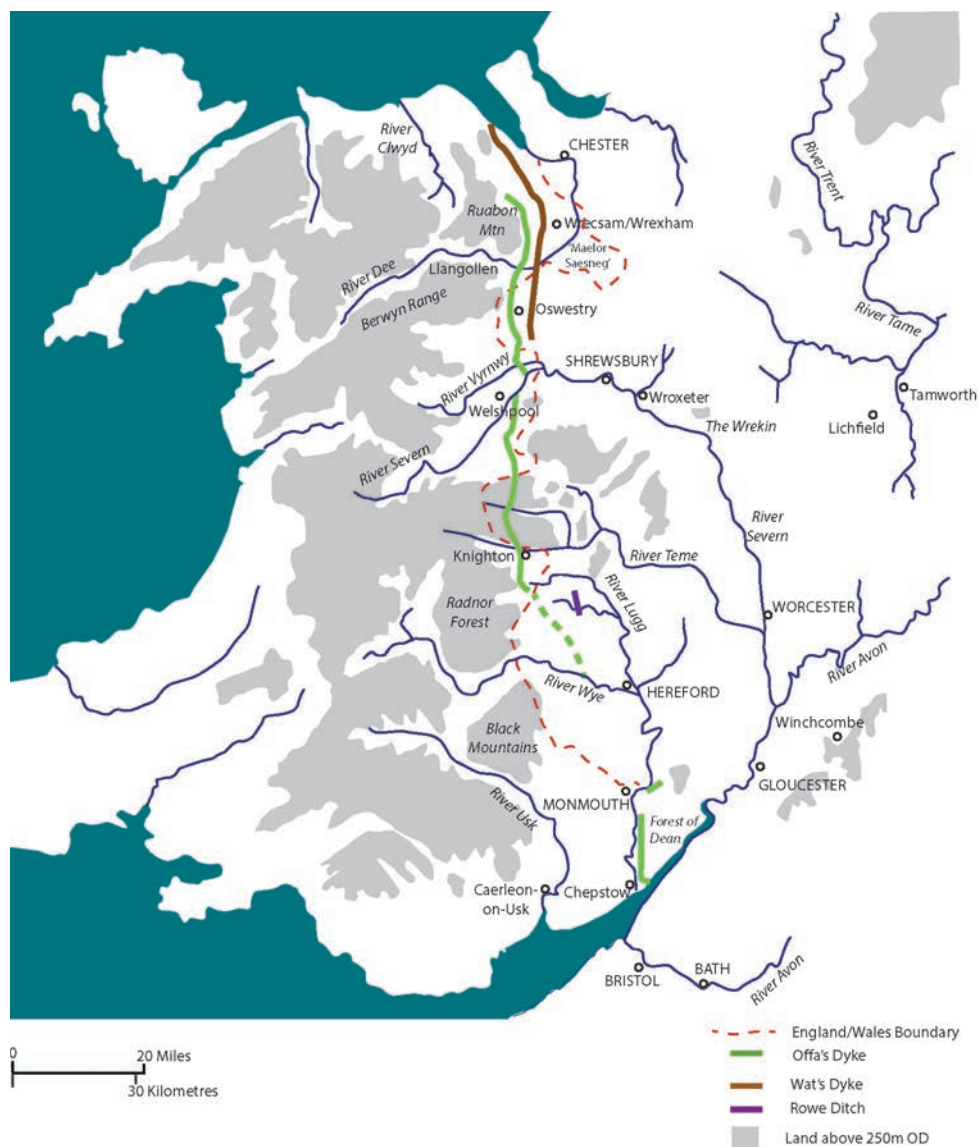


Figure 1: The extent and course of Offa's Dyke and Wat's Dyke as understood in 2016 (after Ray and Bapty 2016, figure 1.1)

coinage (and that of his successor King Coenwulf) with its repeated depiction of the monarch dressed in Roman imperial garb, also served to identify the Mercian ruler as the foremost inheritor of *Romanitas* in Britain (Ray and Bapty 2016: 254–364).

While Ray and Bapty (2016) both reviewed past research and specified new interpretations in greater detail than hitherto achieved regarding Offa's Dyke's siting, design and construction methods, the aim was also to emphasise what we do *not* yet know about Offa's Dyke and the frontier. Some aspects of this ignorance, such as the exact date of construction of the earthwork, are very basic but remain difficult to

resolve and the book aimed to provide a stimulus to further work (Ray and Bapty 2016: 3–5, 19–25, and 371–373). This has led since 2016 to the formation of the Offa's Dyke Collaboratory (referred to subsequently here as ODC): a network and a vehicle for the sharing of information and insights about the dykes of the early medieval Anglo-Welsh frontier and their conservation. This initiative has facilitated meetings, collaborations and fieldwork (reviewed by Williams and Delaney 2019; see also Belford 2019; Grant and Jones 2019).¹

The reconnaissance visits and observations reported in a highly interim manner in the present article have contributed a further element to this new era of study (Figure 1). The present article comprises first, an introductory essay explaining briefly how the Dyke can be recognised and distinguished in the field, followed by seven locationally specific essays before a similarly brief concluding essay. These seven sections outline the interim findings of recent field studies in the lower Wye valley in Gloucestershire (three essays), in north Herefordshire, close to Montgomery town on the Montgomeryshire/Shropshire border, near Trefonen in north Shropshire, and across central and northern Flintshire.

Identifying Offa's Dyke in the field from its key characteristics

Keith Ray

The history of the study of Offa's Dyke as a monument in the landscape has featured numerous attempts to explain the many apparent gaps that occur along its course. Some of these gaps are readily explicable as resulting from subsequent activity and corresponding loss. Two examples are a quarry at Treflach Wood near Trefonen west of Oswestry (Fox 1955: 63 and plate XIVa) and the yet more extensive quarry on Lynclys Hill nearby (Fox 1955: 65–66, fig. 28). Other gaps occur where rivers stand proxy, as with the dislocation along the River Severn that occurs over the course of 8km north-east of Welshpool, and with a more minor displacement on the Dee south of Ruabon. Wherever doubt remained as to the former existence of the Dyke where it was thought that it *ought* to have existed (as for example in north Herefordshire north-west of Hereford) much effort has been expended trying to find an explanation for its apparent absence.

Cyril Fox attributed the intermittent presence, or actual gap, in north Herefordshire to thick forest having existed in such locations at the time of earthwork construction

¹ Among other things, the launch of the Offa's Dyke Collaboratory and its website prompted the definition of a series of research questions and agenda, and a conservation agenda (Ray 2017a, 2017b, 2017c, 2017d, all of which have since then been available through that website). Other new fieldwork involving excavation on or near the Dyke or the course of the frontier has taken place at Spital Meend in Gloucestershire (Hoverd and Mayes 2018; Ray 2019), and at Breinton House near Hereford (Delaney and Ray 2018: 156–157).



Figure 2: The Offa's Dyke 'adjusted-segmented' design/construction device. 2a (above): at Rushock Hill, Herefordshire. 2b (below): at Spoad, Newcastle-on-Clun, Shropshire (Photographs, left: Keith Ray; right: Adam Stanford)

(Fox 1955: 179, 210–211). However, David Hill and Margaret Worthington dismissed this idea, pointing out that ‘Herefordshire had the smallest amount of forest recorded for any of the Domesday shires along the Welsh border’ (Hill and Worthington 2003: 130). Having themselves sought without success to discover traces of the Dyke that might fill in these gaps in this area during their protracted ‘Offa’s Dyke Project’, they ultimately concluded that the lengths of linear earthworks at Lyonshall and elsewhere in what they termed ‘The Herefordshire Plain’ had nothing whatever to do with Offa’s Dyke (despite providing no other plausible explanation for their presence; see Fox 1955: 174–182; Hill and Worthington 2003: 129–138). This conclusion was in turn questioned in the *Landscape and Hegemony* book, where arguments in favour of this gap being more apparent than real (including eyewitness testimony extending back into the seventeenth century) were provided at some length (Ray and Bapty 2016: 285–288).

The difficulties of tracing the line in some locations were rehearsed carefully by Cyril Fox, such that he specified some principles to be applied to any length that might be proposed as having once formed part of the monument. This came down to a ‘rule’ he devised that he specified as ‘the acceptability of uncharacteristic sectors as veritable portions of the Dyke depends on their being in direct extension of characteristic portions, on an alignment such as the Dyke might be expected to take’ (Fox 1955: 215). While Fox and others have defined key characteristics of the design and building practices of the Dyke, the common assumption has been that it was a simple construction (e.g. Fox 1955: 281–282; Hill and Worthington 2003: 101).

It therefore came as a surprise to discover during the field examination of the monument along its length in preparation for writing the *Landscape and Hegemony* book that some fundamental features of its construction had either not been adequately reported or had escaped notice altogether.² A key example of the latter was the way in which the Dyke had been built in segments, and had often been arranged in what was thenceforward termed an ‘adjusted-segmented’ manner (Figures 2a and b; Ray and Bapty 2016: 194–208). It follows logically from this, that it is not physical continuity that is necessarily the most important determinant of whether any ‘candidate’ length of linear earthwork can be regarded as likely to have formed part of the original scheme (although its location along a plausible former route is a necessary corollary). Rather, the full suite of siting practices and construction devices should be regarded as sufficiently distinctive that the co-presence of two or more such practices or devices can be taken as indicative of the likelihood that the length in question formed part of the Dyke’s course and construction. This approach has helped guide the field investigations reported on below.

² Such as the extent and nature of quarry-ditches or the existence and form of ‘angled turns’ (Ray and Bapty 2016: 190–191, 234–240).

Offa's Dyke at 'Striguil' by the River Wye in the Tutshill (Gloucestershire) area (ST 540 944 to ST 537 950)

Dick Finch, Simon Maddison and Keith Ray

The arguments for accepting that the lengths of massive linear earthwork overlooking the River Wye and its valley gorge separating West Gloucestershire from Monmouthshire formed an integral part of the overall Offa's Dyke frontier scheme are both complex and compelling. Ray and Bapty concluded that the construction and siting characteristics of the Dyke in Gloucestershire were directly paralleled by near-identical built forms (particularly the 'scarp' mode of construction and the angled turns) and siting practices throughout the course of the earthwork, for instance in Radnorshire, Montgomeryshire and Shropshire (Ray and Bapty 2016: 84–91, 142–151, 165–174, 234–140, 276–277, 283–289).

The recurrence of such near-identical placement and build characteristics argues strongly for contemporaneity of construction and the conception and execution of a single project. Moreover, the earliest categorical reference concerning the Dyke, a reference of AD 1321 to a place west of St Briavels in Gloucestershire as 'Offediche' demonstrates that the attribution of the Gloucestershire lengths of the Dyke could not have been a nineteenth-century invention.³

Towards the end of Fox's account of the Dyke in Herefordshire and Gloucestershire is a section about the relationship between Roman roads and the Dyke in both counties (Fox 1955: 221–222). Prominent within this account is a discussion of the Gloucester to Caerleon Roman road (RR60a: Margary 1967; Silvester and Toller, 2010, figure 4.3) which traced a course from close to the west bank of the Severn near Newnham, then skirting the southern flank of what became the Forest of Dean. It survives today in some stretches, and is nowhere better preserved than in the gradual descent to the Wye on the Gloucestershire side of the river towards the site of the 'Bridge of Striguil' immediately upstream of the port and castle named Striguil (or Strigoil).⁴ The latter is among the earliest Norman stone fortifications in Britain, and it has been argued that its fabric contains Roman period fabric assumed to have come from a Roman settlement on the site of the later town attested from coin finds and a cremation burial cemetery (Shoesmith and Allen 2006: 2–3, 10–12). Fox argued that just to the north of this early bridging-point of the Wye nearest the Bristol Channel, the Dyke descended from Chapelhouse Wood to the bank of the Wye and moreover that here, uniquely in Gloucestershire, the 'frontier line' became the river itself.

In view of observations made by the present authors early in 2018 and 2020 (with permission for access from the relevant landowners), it is now evident that Fox was mistaken in his

³ Contrary to the suggestion by Hill and Worthington (2003: 42). The St Briavels reference was cited in Baggs and Jurica (1996: 247–271).

⁴ Frank Noble (1983: 2) noted that the Striguil bridge 'still has the bases of its timber piers revealed at exceptionally low tides.'



Figure 3: Chepstow Bridge (an early iron bridge across the Wye built by the engineer John Rastrick in 1816) looking north. The bank of Offa's Dyke occupies the top of the break of slope north from the bridge (above the houses on either side of the ancient routeway). Early in 2020, the co-authors traced the bank of the Dyke surviving in good condition ascending the slope diagonally from the roadside opposite Elm Villa up through the grounds of Castleford House to a point overlooking the cottages at left in this view (Photograph: Keith Ray)

suggestion that the linear earthwork descended to the riverbank in Chapelhouse Wood.⁵ Instead it is possible to trace it (albeit in much eroded form) along the top of the low river-cliffs here (ST 534 950 to ST 532 947) and then south-eastwards across the line of the Roman road (at ST 532 948). Moreover, to the east of Elm Villa there are traces (not identified by Fox) on the slopes above John Rastrick's (1816) single-span iron Chepstow Bridge. For example, in 2020 it was found possible to identify the earthwork surviving remarkably well both at the (newly discovered) angled turn situated above Castleford Hill Road on its northern side (ST 534 946), and then to trace its bank climbing diagonally eastwards across the south-facing slopes through the southern grounds of Castleford House Care Home (ST535946; Figure 3).⁶

⁵ This is not a new objection to Fox's account. Frank Noble (1983: 2) also noted that Fox's reasoning that the Elm Villa bank (Figure 3) could not have formed part of Offa's Dyke 'involved a total inversion of logic', observing also that 'It would have suited Fox's theories (about Welsh boatmen and the exacting of tolls for passage upriver) better to have recognised this Elm Villa bank as the line of the Dyke, rather than to claim that, at the crossing (of the Wye) of the major route between England and Wales, the river bank itself was sufficient frontier' (Noble 1983: 2).

⁶ Further south again, the reconfigured main road (A48) crossing of the Wye next to the railway bridge (a late twentieth-century project) on the Gloucestershire bank involved cutting through limestone bedrock on the line of the Dyke at the rear of gardens on the west side of Beachley Road, Tutshill. This appears to have intercepted the line of the ditch here, since a large walled-up V-shape plainly visible in the side of the road cutting stands in exactly the spot that would be anticipated for the line of the Dyke: an observation not made before 2017.



Figure 4: Offa's Dyke at 'Striguil'. 4a (above): the front of the bank of Offa's Dyke at Elm Villa, Tutshill, Gloucestershire, looking north-west (Photograph: Keith Ray). 4b (below): the line of Offa's Dyke south-east of Chapelhouse Wood and north-west of the Elm Villa bank, looking north-west. The hedge-line here (left) has been cut into the front of the Offa's Dyke bank. The level area to the right of the walking figure (Liam Delaney) is where the quarries for the Offa's Dyke earthwork bank were initially cut through the Roman road as it descended the final gradient towards the Wye riverbank (over the hedge to the left). The resulting level area could then have housed the inner part of the Dyke gateway infrastructure (Photograph by Keith Ray)

Between these two newly recognised stretches of Offa's Dyke, at Elm Villa itself, the earthwork has been modified by the building of stables along the track that follows the former course of the ditch (at ST 5335 9445; Figure 4a). However, beyond these buildings north-westwards it survives well along a stretch measuring more than 100m long (Figure 4b). There are clear indications of the presence of quarry ditches immediately along the northern flank of the earthwork, then a broad bank standing even today more than 2m high, with a drop to the south of 4–5m down to the infilled ditch. Further westwards it reduces in height to become a 2m-high lynchet followed by the later field hedge.

As the former Roman road descends the slope westwards towards the river here, it reaches a point where what are apparently more of the quarry-ditches of the Dyke seem to cut across its line. This is particularly clear in LiDAR imagery for the site (Figure 5, based upon LiDAR imagery provided courtesy of Jon Hoyle and Gloucestershire County Council). It is potentially highly significant that, as the Roman road descends the slope westwards towards the river and just to the east of the point where it is intercepted by the line of the Dyke, it changes character abruptly in precisely the location where one would expect quarry ditches for the Dyke to have been dug.

Two possibilities therefore exist here. One possibility is that the digging of the Dyke quarries to obtain material for the bank involved the truncation of the road at the point where it abruptly changes character. This would have meant the severing of the former route and would have required an early medieval, Anglo-Saxon, re-siting of the Wye crossing to a location close to Rastrick's bridge, directly opposite Chepstow town. The alternative possibility is that there was a complex adjustment, and potentially also a rebuilding, of the Roman road in some way so that it could pass through a newly installed control point or gateway through the Dyke that then gave access directly onto the river frontage and the (presumably rebuilt) Roman bridge.

Either of these possibilities present fascinating further avenues of enquiry, and inevitably nonetheless more questions. In the case of the former possibility, for example, was the re-siting made deliberately to stimulate a Mercian market on the 'Welsh' bank of the Wye, beyond the Dyke?⁷ Ostensibly the weight of current evidence is against this.⁸ Interestingly, as already noted there are a number of Roman period finds from Chepstow itself (Noble 1983: 2–4; Shoesmith and Allen 2006) which suggests that it

⁷ The name 'Chepstow' is derived from Old English *ceapstow*, 'market-place'; Ekwall (1960: 100).

⁸ The Normans recorded the name as *Striguil* in 1086, which is an anglicisation of the Welsh word 'ystraigyl' which simply means 'the bend' (Shoesmith and Allen 2006: 6). It is not inconceivable that this was the Welsh name for the place that was known at the same time to the English as *Ceapstow*. Noble, however, was convinced that the line of the Roman road was deliberately truncated, and the river crossing diverted southwards to the location later occupied by the Rastrick Bridge, precisely to stimulate a new Mercian market settlement at Chepstow (Noble 1983: 2–3).

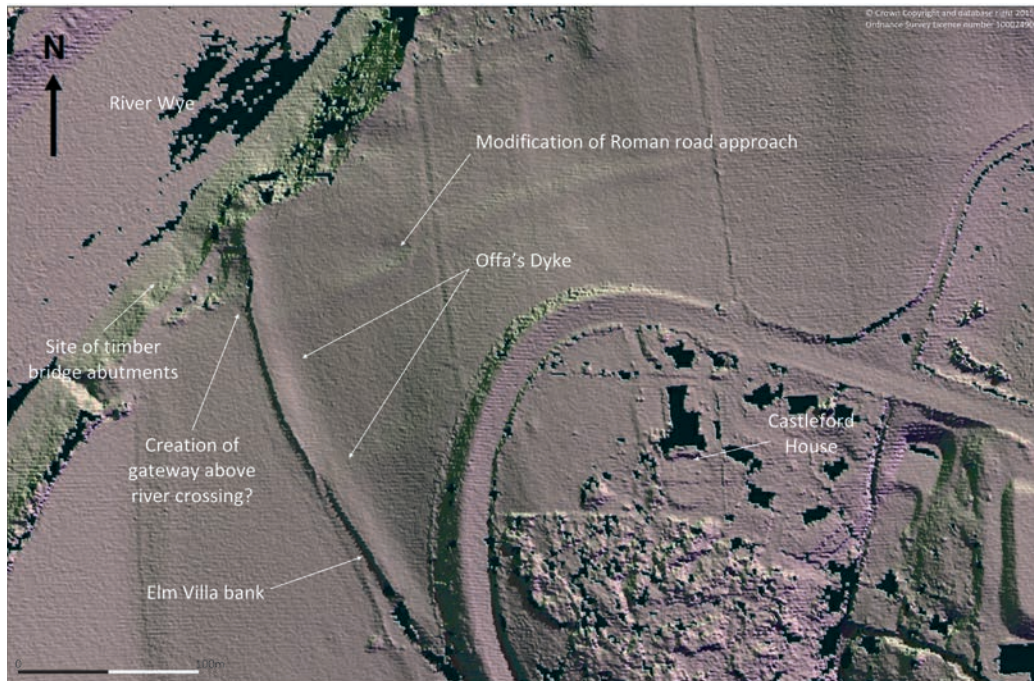


Figure 5: LiDAR data DTM enhancement illustrating the principal features at the Wye crossing immediately below and to the north of Chepstow Castle (LiDAR mapping Gloucestershire County Council; annotation: Simon Mayes, for Keith Ray)

may have continued as a settlement of some kind in the post-Roman centuries. The Roman road continues west of Chepstow from its visible embankment at High Beech (ST 525 931) and on to Crick, situated on the road towards Caerwent (Burnham and Davies 2010: 316).

The very pronounced *agger* of the Roman road approaching the Chapelhouse Wood area of Tutshill, and the road crossing the southern margins of Piercefield Park approaching the bridgehead from the west therefore indicate the crossing-point of the river most likely to have been used.⁹ Only excavation at the point where the line of the Dyke crosses this road on the left bank of the Wye south of Chapelhouse Wood will resolve the question as to whether the road was truncated by the Mercians when they built the Dyke and the bridge was moved 800m or so downstream southwards; or whether the intersection of road and Dyke was deliberately used to create a gateway and customs point on the Mercian side of the river.

⁹ Two excavations have apparently identified the footings of the Roman-period bridge. One was an excavation undertaken in 1911 on the Welsh bank by Dr Orville Owen. Another was conducted in 2004 for an 'Extreme Archaeology' TV series programme. For the latter, samples were taken from footings on the English side for dendrochronological and radiocarbon analysis, producing a date in the first century AD (Anne Rainsbury, Chepstow and Monmouth Museums: pers. comm. to Simon Maddison).

To the north of Chapelhouse Wood, the cliffs overlooking the Wye increase in height to as much as 90m above the River Wye. Quarrying that has taken place in historically recent times northwards here in the Woodcroft area towards Wintour's Leap has cut the cliffs back, and it has probably resulted therefore in the total loss of the earthwork along this whole stretch. However, in 2017–18, a series of exploratory investigations carried out at Spital Meend promontory fort and involving surface survey, geophysics and a single trench excavation (ST 541 967) found possible traces of the Dyke bank along both northern and southern margins of the high promontory overlooking the Lancut peninsula (Hoverd and Mayes 2018; Ray 2019). The excavated section bisecting a bank crossing the promontory close to its tip overlooking the Wye raised the possibility that the short earthwork concerned was first built in post-Roman times before modification in the medieval period.¹⁰

In summary, it can now be understood that the stretch of Offa's Dyke on the east bank of the River Wye from the railway bridge across the Wye (parallel with the A48 main road; at ST 541 941) northwards to a point opposite Chepstow Castle and on towards Woodcroft and Spital Meend was originally a continuous work. It has been much interrupted by limestone quarrying and suburban development in the past two centuries, and it is therefore far from easy to trace in the present landscape. More of its structure survives, however, than has been identified by previous fieldworkers. New reconnaissance fieldwork will concentrate more closely on the eastern part of this area. For example, a close search in gardens along the western side of Beachley Road, Tutshill might well reveal hints and clues concerning the survival of short stretches of earthwork between formerly quarried areas. The survival of lengths of earthwork until now dismissed as the result of quarrying and erosion northwards from Chapelhouse Wood also needs to be countenanced and further survey carried out.

However, it is the 'junction area' near Chapelhouse Wood, Tutshill, close to the point where the Roman road from Gloucester to Caerwent and the Dyke traversing the area immediately opposite the site later occupied by Chepstow Castle that most urgently needs to be the subject of intensive investigation.¹¹ This area, which encompasses the road crossing from east to west, and the line of the Dyke as envisaged by Noble and as now underscored by the recent studies reported here includes both the Elm Villa bank and what Fox dismissed as a 'lynchet' running north from it. Whatever the result was in terms of the later history of the crossing of the river Wye in the 'Striguil'/Chepstow area, the line of a major Roman road was clearly disrupted by the creation of the north-south aligned earthwork that traverses it here, and that we now envisage as an integral part of Offa's Dyke. The importance of the site is therefore very considerable: this location in our

¹⁰ Iron Age and Romano-British pottery found associated with this bank was heavily worn and mixed and was therefore deemed residual (Hoverd and Mayes 2018; Ray 2019).

¹¹ The focus of this essay within the overall 'Continuing journey' article is upon Tutshill. This is not to say, however, that other locations, such as the Spital Meend fort, do not merit further study and investigation.

view provides the best opportunity *anywhere along the course of the Dyke* to obtain evidence concerning a clear relationship between a major Roman period work and the Dyke.¹² An archaeological examination of this location should be a research priority for Offa's Dyke.

Tracing Offa's Dyke in the Lower Redbrook to English Bicknor area, Gloucestershire (SO 542 096 to SO 595 170)

Jon Hoyle and Keith Ray

This span of country is situated immediately to the north of the last traditionally recognised length of Offa's Dyke following the Wye Valley (on the high north-south ridge near Highbury Farm before that ridge descends to Lower Redbrook village (at SO 539 092). The stretch in question is located on the western margin of the village of Lower Lydbrook at Tumpshill Grove (SO 596 169) which was for many years presumed to lack traces of Offa's Dyke. Writing in 1894, for example, Maclean wrote: 'On the next occasion, accompanied by Mr Oakeley, I explored the whole length of the county boundary from Staunton to Bellman's Oak without discovering the Dyke.' (Maclean 1893–94: 27–28). Likewise, Noble presents a similar view: 'It is probable that if any full-scale Dyke existed between Redbrook, Symond's Yat and Lydbrook it would have been recorded by earlier surveyors and antiquarians' (Noble 1983: 11). Cyril Fox also noted the lack of any trace of the Dyke west of Symond's Yat. Oddly, he refused to accept portions of the Dyke that he himself had carefully noted in the eastern part of English Bicknor parish, as certainly having formed part of the Dyke (Fox 1955: 184–186).

Jon Hoyle and Jo Vallender (then of the Gloucestershire County Council archaeological service) carried out a 'condition survey' of Offa's Dyke in Gloucestershire in 1996, funded by the (then) historic environment organisation English Heritage (Hoyle and Vallender 1996). They highlighted how several of the isolated surviving lengths of Dyke in English Bicknor parish had construction features typical of the Dyke elsewhere, and they noted further isolated lengths of bank, for instance one to the south of Symond's Yat (see below).¹³

¹² There is a considerable irony here: that Fox failed to recognise this conjunction and to excavate here, given that his explicit reason for excavations at Mansell Gamage west of Hereford and at Forden in Montgomeryshire (Fox 1955: 203–2044; 115–116, respectively: in both places where there was allegedly an intersection between a Roman road and the Dyke) had been to establish which preceded which, and in what way. The irony is compounded by the fact that he failed to demonstrate any such relationship in either of these other places.

¹³ All the above fieldworkers (including Hoyle and Vallender, whose fieldwork took place in September) appear to have conducted their surveys in summer conditions when vegetation growth obscured much of the ground. In contrast, all the Gloucestershire fieldwork of 2016–17, 2017–18, and 2018–19 took place after leaf-fall and frosts (and sometimes snowfall) had reduced vegetation levels and improved visibility considerably.



Figure 6: The Dyke at full proportions facing north (right) overlooking the River Wye on the east-facing slope of a ridge at Great Collins Grove. Viewed from the east in February 2018 (counterscarp bank to right, ditch at centre, bank to left) (Photograph: Keith Ray)

Building on Hoyle and Vallender's observations, the reconnaissance visits reported here were designed therefore to follow up this earlier work under ideal winter conditions for the visibility of sometimes very subtle surviving earthworks. The result is that we can now say with some confidence that it is possible to trace the Dyke as a significant feature (and in some locations surviving in its original form and substantially complete) more or less *continuously* between Lower Lydbrook (in the east) and Symond's Yat Rock (in the west). Furthermore, southwards of this stretch, lengths of the Dyke can be discerned both north and south of Staunton village.

The Dyke at Tumpshill Grove (SO 595 171; point A on Figure 9) that was only tentatively identified by Fox has now been inspected under better conditions than obtained hitherto either in Fox's survey of 1931 or during the 1996 study and it has been found to survive remarkably well either side of the former Monmouth and Ross railway line immediately west of Lower Lydbrook. It exists as a prominent feature along Tumps Hill, through Great Collins Grove to Collins Grove, and down the narrow coombe (at SO 580 164) below Rosemary Topping (Figure 6; point B on Figure 9). It is absent only where its structure has been compromised by subsequent development (for instance by the building of roads or houses, by quarrying or by agricultural works).



Figure 7: The Dyke at Coldwell Rocks, approaching Symond's Yat Iron Age multivallate promontory fort, viewed from the east. Although eroded, the profiles of the bank (at left centre), ditch (at right-centre), and counterscarp bank (at right) are plainly visible (cliffs above the River Wye are located downslope to the north) (Photograph: Keith Ray)

The Offa's Dyke earthwork can, moreover, be traced in woodland along the scarps directly overlooking Coldwell Rocks (Figure 7; for example, point C on Figure 9). It can also be shown not to have reused any of the concentric circuits of defensive ditches of Symond's Yat hillfort as Fox and others had assumed. Rather, at least on the eastern side by Coldwell Rocks (less affected by historically recent limestone quarrying), it appears to have cut straight across the north-eastern extremities of these banks and ditches to link up directly with the Yat Rock itself. This would have served to emphasise the importance of the likely frontier gateway (cf Yat = 'gate' place-name) at that location. It also mirrors to some extent the way in which the Dyke appears not to have used the major defensive earthworks at Spital Meend near Chepstow (see Finch, Maddison and Ray above, this article).

Beyond the Symond's Yat promontory south-westwards, the stretch of bank that had been recorded by Jon Hoyle in 1996 was re-visited in 2018. This again was found to conform to build practices known from elsewhere in Gloucestershire. Two further observations were however added to those of two decades ago. The first was that the shortness of this recorded length is due to the former progress of limestone quarrying to the west (long ago halted) immediately adjacent to the River Wye. This fragment has survived due to the fact that it was the easternmost length to have existed in this area south-west of the Iron Age promontory fort, and it is truncated by two different 'lobes' of the riverside quarry to the north-west and



Figure 8: The Dyke sited along the rocky ridge south-west of Staunton (Gloucestershire), approaching the Buck Stone, viewed from the south-west. The bank survives here as a series of lengths of bank linking the rock outcrop: much of its bulk was removed and made into an estate wall here (Photograph: Keith Ray)

to the south-west (location at approximately SO 560 154; point D on Figure 9). The second observation is that the bank and ditch forming the northern (east–west oriented) boundary of Mailscot Wood (here in the form of a classic ditched medieval woodland boundary bank) cuts straight through the apparent Offa’s Dyke bank, providing a clear stratigraphic relationship: the ‘Dyke’ bank clearly pre-dates the woodland boundary bank.

In 2019, the line of the Dyke was traced intermittently along the rocky north-facing scarp westwards from Staunton village uphill towards the Buck Stone (SO 543 123; Figure 8; point E on Figure 9). This provided a prospect over the hills on either side of the Wye gorge north-east of Monmouth. At this point, the earthwork appears to have turned southwards and then a series of extended lengths of bank was found, again surviving intermittently along south- and west-facing slopes at Staunton Meend and southwards again from Knockhalls Lodge (being discernible at approximately SO 542 115) downslope into Knockhall’s Inclosure (point F on Figure 9) and the valley bottom upstream of Upper Redbrook (SO 544 109).¹⁴

¹⁴ All this area will require future closer scrutiny and mapping. The available LiDAR data permitted identification of likely linear earthwork locations. In some places these were readily traceable on the ground: as where they followed the crests of west-facing scarps. Vegetation that was dense even in winter made it difficult to find some linking stretches. At one point, the linear bank approached a massive spring from both (north and south) sides and appears to have detoured around the upper lip of the curving scarp that enclosed it.

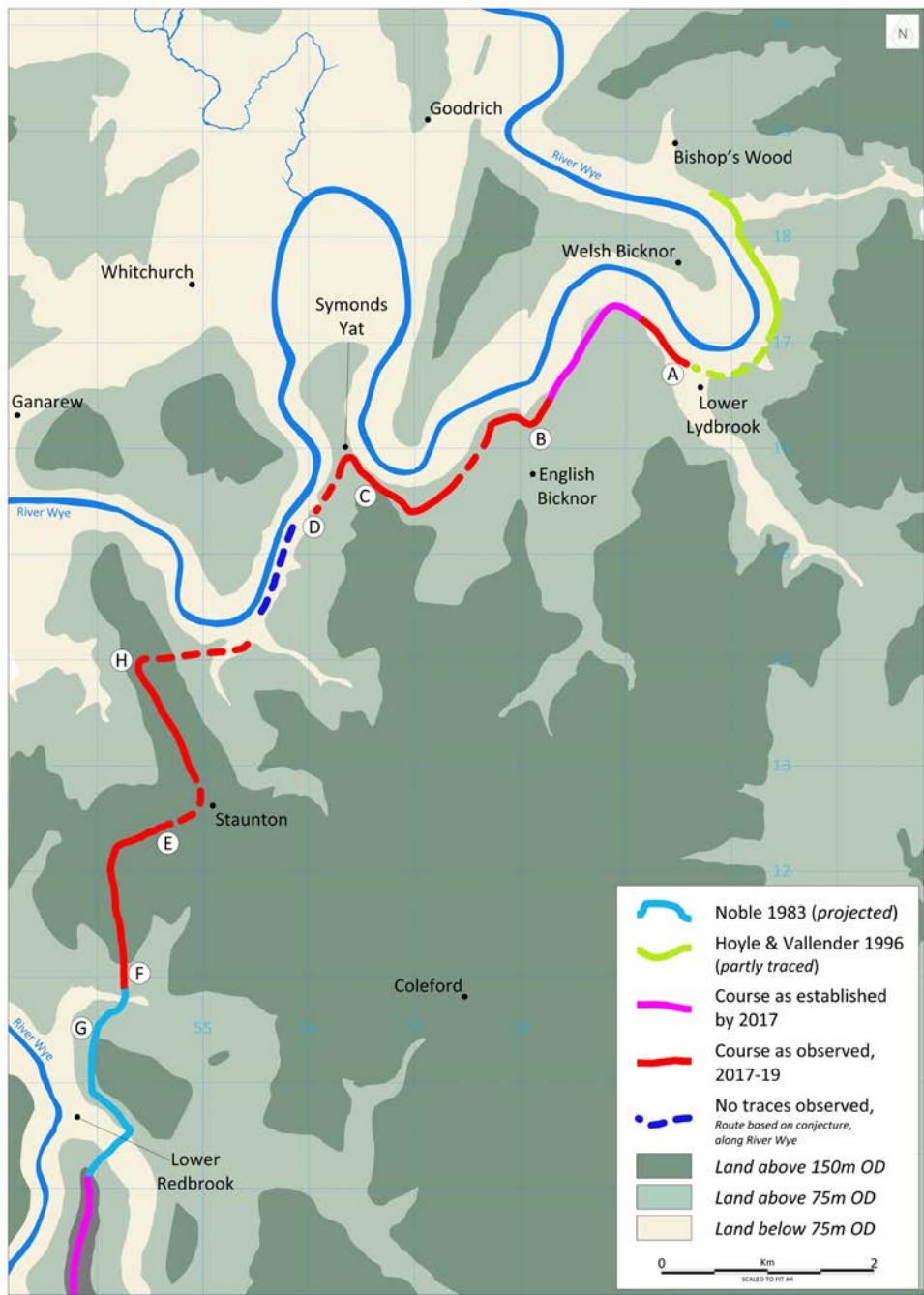


Figure 9: The course of Offa's Dyke in north-west Gloucestershire above the River Wye and south-east of Monmouth. The map indicates the lengths previously known or suspected from survey work by Cyril Fox in 1931 (short lengths close to English Bicknor village), Frank Noble in the late 1970s (immediately north of Lower Redbrook), and Jon Hoyle and Jo Vallender in 1996 (north-east of Lower Lydbrook and into southern Herefordshire). All lengths marked in red were walked and ground-checked by the authors of this section of this article in visits in 2017, 2018 and 2019. Annotation of base mapping: Simon Mayes (under licence from the Ordnance Survey).

The close examination of LiDAR survey data enables the tracing of a near-continuous bank through Furnace Grove (G on Figure 9) and along the south-west facing slope in Forge Wood above Lower Redbrook. At approximately SO 544 095, this bank appears to turn southwards downslope towards the southern limit of the wood in the valley-bottom of the Valley Brook, whence it must be assumed it climbed up the steep north-east facing slope to meet the ‘known’ length of the Dyke at Highbury Farm.¹⁵

North of Staunton, a prominent north-south aligned earthwork bank is traceable to the east of an access track leading towards Redding’s Lodge (SO 547 133). This bank runs parallel to a steep slope facing westwards onto Highmeadow Woods. A much slighter linear feature runs in a curve north-westwards towards this scarp and may mark the former line of the Dyke towards Near Harkening Rock (at SO 543 140) or the nearby Suck Stone (point H). Just to the east of this point the county boundary with Monmouthshire runs eastwards down a broad spur. Halfway down this spur the boundary is marked by a deep natural cleft that leads down to a broad plateau standing prominently above the Wye at SO 552 143. Despite several attempts to locate the presence of a linear earthwork between here and the northern end of Mailscot Wood, no trace could be found. One possibility is that 1200 years ago, as now, the river itself formed the boundary and stood in place of the Dyke. Only further intensive survey is likely to resolve this question (Figure 9).¹⁶

The cumulative impact of this reconnaissance work across three winter seasons (2016–17, 2017–18, and 2018–19) has been to envisage *for the first time*, the former existence of a continuous span of the Dyke from Sedbury Cliffs on the Severn Estuary northwards to the historic border with Herefordshire north-east of Lower Lydbrook. Jon Hoyle’s survey and LiDAR ground-truthing visits have moreover located short lengths of earthwork to, and beyond, Bishops Wood on that border, and there are hints also that it continued beyond Bishop’s Wood and towards Howle Hill (Hoyle and Vallender 1996; Hoyle 2019).

¹⁵ The existence of this earthwork was also noted by Frank Noble: ‘There is a local tradition at lower Redbrook that the Dyke continued north-eastward from Highbury Farm, across the valley and up through Forge Wood. This has proved too dense for a brief survey, but a line of low bank, unrelated to modern boundaries has been traced for more than a quarter of a mile through the woods on the crest of the slope above Upper Redbrook, and another stretch on the other side of the road to Newland, across the old railway cutting, runs beside the track along the crest of the spur towards the Buckstone near Staunton’ (Noble 1983: 11). It can hardly be a coincidence that this is precisely the course through Knockhall’s Inclosure that we traced, albeit southwards (and without realising that this was identical to Noble’s description) early in 2019.

¹⁶ This represents the only remaining conundrum of the Gloucestershire course selected for the Dyke. It is not impossible that the Dyke extended in one form or another northwards to Far Harkening Rock at SO 541 151 (the names of these ‘hearkening stones’ are themselves intriguing) and then turning abruptly eastwards opposite the Severn sisters Rocks on the right (Herefordshire) bank, and extending around opposite The Biblins to link up to the Mailscot Wood stretch of the earthwork (see below).

This raises the question of exactly why Offa's Dyke extended northwards towards the Wye gorge east of Monmouth to reach Symonds Yat, but then turned eastwards rather than being picked up on the north bank of the river continuing on a more directly northwards course. The simplest answer is to point out that the quasi-independent British kingdom of Ergyng stood in the way on that bank of the river. A more nuanced possibility is, however, that what was being protected (or sequestered) by the Dyke in the lower Wye valley was not simply 'Mercia', or even the former independent Anglo-Saxon kingdom of the Hwicce, but rather Dean itself. What would have been included within the span of the Dyke (clearly an impressive work throughout its Gloucestershire course, and a more formidable barrier here, arguably, than almost anywhere further north along the frontier), therefore, was rather a resource: the extremely valuable, and taxable, economic asset of manufactured iron.

In the years immediately after its construction, the wall-like appearance of the Dyke must have been very evident when viewed eastwards across the Wye valley between Tutshill in the south and the Buck Stone, Staunton, in the north; when viewed south-eastwards between the Buck Stone and Symonds Yat; and then when looking southwards between Symonds Yat and Lower Lydbrook (and beyond). This massive work in this way served to reinforce the fact of appropriation of this key resource into Mercian, and, subsequently, English royal control.

The results of field observation here clearly need to be followed up, both by more detailed (measured) survey and by selective excavation, to establish the true character (and potentially also the date) of these lengths. The 'lived reality' of the creation of these sections may have been even more complex than suggested here. Only further intensive survey of these nonetheless 'difficult' landscapes, and well-co-ordinated localised investigation by excavation, will eventually serve to resolve the attested anomalies.

The implications of the fieldwork reported here are nonetheless considerable, and considerably important. What is most important is that, by showing Offa's Dyke to have been continuous in this part of the Wye Valley, it has reinforced the sense not only that its planning and execution was deliberate, but that there was a clear intent to isolate Dean physically from the land to both the west and the north. The key implications of this realisation are the related and consequential ones that, firstly, the Dyke's construction was undertaken with multiple aims and purposes in mind; and, secondly, that this continually took into account the real-world and on-the-ground complexities of a multi-dimensional political and strategic frontier.

Construction features of Offa's Dyke in Gloucestershire: some new evidence

Tim Copeland, Jon Hoyle and Keith Ray

A series of winter season field studies in the early months of 2017, 2018, and 2019 have been looking anew at the Dyke in Gloucestershire. They have involved field visits right along its course to review places where the exact routing of the linear earthwork was uncertain, but an additional concern has been to try to better understand aspects of its

construction and siting.¹⁷ One of the key categories of discovery concerns the relationship of the Dyke to field systems apparent on LiDAR images (see also Hoyle 2019). An example is at Madgett Hill where (at SO 546 007) a prominent lynchet forming part of an early field system located on a north-facing slope was observed as having clearly cut through by the ditch (and covered by the bank) of Offa's Dyke (Figure 10).

Meanwhile, at Brockweir, the bank of the Dyke crossing the Brockweir stream (at SO 546 015) is encased entirely within the stone-wall-enclosed structure of a (long-since breached) medieval dam. At Wyeseal Wood above the Mork Brook, the Dyke has now been traced along a stretch of scarp-edge located high up, overlooking the Wye (at SO 547 060). It had not previously been recorded here because of the masking effect of (almost continuous) subsequent quarry-delves that repeatedly cut through the top of the scarp along which the Dyke ran. At Red Hill Grove (Lower Meend, St Briavels: SO 547 046), the very stony bank of the Dyke has been traced, partially submerged in marshy ground, all the way northwards to the stream at the foot of the south-facing scarp upon which Lindors Farm stands (Figure 11).

However, it is the observations made concerning the construction features of Offa's Dyke along the north-facing and west-facing scarps overlooking the Wye that are discussed at some length here. One feature of particular interest is how the almost pristine condition of the Dyke in locations such as at Great Collins Grove (SO 584 167) facing north-westwards across the Wye to Welsh Bicknor) and at Lippetts Grove/Passage Grove above Tintern Abbey (SO 540 002) has meant that the recognition of both original profiles and primary built details has been possible. In both places, for example, the Dyke is still capped with stones placed over an earthen base, while the original profile featuring a steep west-facing frontal scarp and a much more gradual slope eastwards to the rear of the rampart is clearly recognisable. At Great Collins Grove, as well as at Madgetts Hill (at SO 546 013), there is clear evidence for a layered stone slab fronting structure to have been set in successive receding layers to form a wall-like facing above the ditch.¹⁸ Among other things, this enables an appreciation of the structure of the Dyke elsewhere where a stone fronting was created but has since eroded almost completely away (see the section on Pentre-shannel near Trefonen, below, for example).

Other structural features include indications of a horizontal stone slab course built into and along the rear of the bank within an angled turn at Tumpshill Grove (SO 592 173), which had been exposed during refurbishment of an approach road to modern commercial office premises and observed in 2017. Between Passage Grove and the Devil's Pulpit, what had been assumed to

¹⁷ These winter observation/reconnaissance visits have been undertaken either solo by Keith Ray or accompanied either by Jon Hoyle (three visits) or by Tim Copeland (three visits), or by Dick Finch and Simon Maddison (two visits). They have underscored the importance of visiting and revisiting key locations (such as for example Plumweir Cliff and Caswell Wood: see Ray and Bapty 2016: figure 1.28).

¹⁸ Madgett's Hill layered slab capping: see Ray and Bapty 2016: figure 5.17.



Figure 10: The line of Offa's Dyke on its north-south trajectory clearly cuts through a prominent east-west early field system lynchet by Beeches Farm here, on a steep north-facing slope at Madgett Hill near Brockweir, Gloucestershire. Viewed looking uphill from the north-west, the lynchet bank (facing the camera position) is visible at right-centre and centre, crossing from right to left, where the ditch of the Dyke truncates it (bank of the Dyke visible as a skyline feature)(Photograph: Keith Ray).



Figure 11: In the valley of the Mork Brook, south of Lindors Farm, in March 2018: looking south here, the north facing scarp of St Briavels Common is just visible through the trees as a skyline feature. The quarry ditches for the bank of Offa's Dyke are located to the left (where Tim Copeland stands in this photograph), the much eroded and spread bank, capped by stones, fills the ground at centre-right. The west-facing ditch is visible at right (Photograph: Keith Ray)

be a modern cut through the Dyke has been re-appraised during recent inspection surveys. Here, a trackway leading up from the Wye opposite Tintern approaches the Dyke from the north-west, up the southern side of a prominent spur. As the Dyke approaches the point at which the trackway traverses the Dyke from north-west to south-east, the northern bank length is aligned to the south-east, deflecting away from the course northwards that the southern bank length takes. This results in a hollow way that rises up in a curve through the earthwork. The curve of the hollow way so formed continues up onto the higher ground behind (east of) the

Dyke bank. The effect is similar to the angled ‘postern gates’ found within the defences of some Iron Age hillforts (Figure 12). The choreography of the bank lengths (which were deliberately set so that the southwards trending bank segment turns inwards as it approaches the gateway, and the northwards trending one turns outwards) and the trackway is such here that it was clearly a design feature of the original construction, rather than an afterthought or subsequent modification (Figure 12a and b).¹⁹

Nearby, north of the modern forestry cut through the Dyke at Passage Grove (SO 541 001) that has already been noted above, the Dyke approaches the prominent promontory hill spur projecting out into the Wye Valley, up the southern flank of which the trackway just mentioned passes. However, instead of extending out to the tip of the promontory spur, it deliberately and abruptly turns north to cut across the

inside of the promontory in a 100m-long straight length. This is quite probably the best-preserved length of the Dyke that exists anywhere along its course. The abrupt shift *could* be seen simply as an expedient measure enacted to save the effort of taking it to the extremity of the promontory. However, the configuration of the sides of the further, excluded, area of the promontory westwards beyond the Dyke earthwork itself includes a series of features that cannot have been formed naturally, or coincidentally. To begin



Figure 12: Just north of the Devil's Pulpit, two lengths of the bank of Offa's Dyke move apart to accommodate a trackway leading up from the river crossing (the 'passage' of Passage Grove) opposite Tintern, and towards Lydney. In these photographs, 12a (above) is viewed from the southerly bank looking downslope towards the Passage; 12b (below) is viewed from the northerly bank looking south in the direction of The Devil's Pulpit (Dick Finch standing in the centre of the gateway path) (Photographs: Keith Ray)

¹⁹ This feature was first recognised as an original feature of the Dyke's construction on a visit conducted jointly between Dick Finch, Simon Maddison and Keith Ray early in 2018.



Figure 13: At Caswell Wood, Offa's Dyke makes a pair of angled turns with a short straight length between them that together take it on a course that excludes the most prominent natural spur (other than that at Symond's Yat itself) on its entire course in Gloucestershire. Why this should be so is uncertain, but the tip of the spur is occupied by a substantial ditched oval mound aligned north to south. The view here westwards from the bank of the Dyke to the tip of the spur (Offa's Dyke Path is visible beyond the ditch in the foreground) (Photograph: Keith Ray)

with, the area just west of the ditch of the Dyke appears to have been carefully levelled, and the edges of the promontory tip to north and south appear form a sharp scarp with a slight bank evident just inside this rim. The whole is reminiscent of the relict bank around the edges of the promontory at Spital Meend promontory fort. Towards the very tip of the promontory (at SO 539 002) another broad low bank crosses the promontory in parallel with the Dyke itself, but some 50m westwards from it. Beyond this bank there is a broad curving ditch which defines the eastern side of another stone-capped feature. This is an oval mound oriented north-south (Figure 13).

The ditch defines the edge of the mound on the west side also, to outline a boat-shaped mound cut off from the rest of the spur. The question as to what this feature signifies will take some effort to resolve. It is most certainly not a 'round barrow' as described in an entry in the Gloucestershire HER. Standing directly above Tintern and on the very tip of the most prominent spur in the district, the fact that the Dyke itself respects its presence must provide some clue as to its former importance. Either it was a pre-existing monument of unknown form, or it was integral with a deliberate design for the promontory as a whole here, that was created at the same time that the Dyke was built. Dominating its

landscape, to some degree echoing the way in which the Pillar of Eliseg visually dominated the Dee valley landscape near Llangollen, it is difficult to avoid the impression that it was a monument to the completion of the work itself, or to its creator.²⁰ Is it too far-fetched to see this feature, with its boat-shaped form, as some kind of cenotaph to Offa himself? Again, only further, more intensive, study will begin to resolve this question: in this case, beginning with a fine-grained survey of the whole of this promontory.

The Wye frontier west and north-west of Hereford

Liam Delaney and Keith Ray

Despite the existence of Offa's Dyke west of Hereford having been discounted by Hill and Worthington, written testimony extending back as far as John Aubrey (c. AD 1690) indicates the presence of a continuous Offa's Dyke earthwork in northern Herefordshire, for instance at Moorhampton west of Hereford (Aubrey folio 87/59; Fowles 1982; Ray and Bapty 2016: 58). Although there is much still to explore in Herefordshire using a variety of field methods, one of the outcomes of the *Landscape and Hegemony* book was to highlight the importance of the area to the eighth-century and later frontier. New studies of LiDAR imagery and new field observations have begun to corroborate the idea of the former presence here of a continuous earthwork between Herrock Hill in the north and the River Wye at Garnons (Byford) west of Hereford (Delaney 2021; including an image of the LiDAR plot, showing the location of the excavation trench). One focus of research since 2016 in this area has been upon the nature of the frontier between Garnons and Hereford, and in particular how the River Wye here, on its east-west course downstream to Hereford itself, may have been enlisted as in effect a frontier work approximating the role of the Dyke itself elsewhere.

The first discovery made during this work involved the processing of LiDAR data of the Breinton area. This revealed the existence of a previously unknown earthwork apparently pre-dating the Norman church, the latter being sited partially over it. The earthwork had a peculiar 'staple'-shaped three-sided plan (the 'fourth' side being the river), at the centre of which had later been placed the walled and ditched enclosure that had provided the summer residence for the Treasurer of Hereford Cathedral from c. AD 1150–1450.

Another particularity of this earthwork was that its ditches were around 20m wide, which is approximately the same width as the ditch belonging to the middle to late Anglo-Saxon defences around Hereford itself. The fort-like character of this earthwork was revealed in an excavation undertaken in September 2018 (Ray 2018; Delaney and Ray forthcoming). The bank comprised a clay core fronted by turves, into which façade had been placed large river cobbles and other stones to create a battered drystone frontage

²⁰ The Pillar does not directly overlook the River Dee itself, but is located in a side-valley. But its presence locally is arguably dominant within the wider valley landscape, especially when viewed from the north.

which would have looked like a strongly built stone wall when viewed especially from the north. While this fortification has yet to be dated closely, its structure suggests broad contemporaneity with the Dyke (Figure 14).

Westwards from Breinton, the Dyke itself descends south-eastwards from Garnons Hill at an oblique angle and reaches the River Wye at SO 408 427 having at that point followed the parish boundary between Byford and Bridge Sollers. The latter settlement was identified simply as 'Bridge' in 1086, and presumably it is no accident that a bridge located here had been sited deliberately close to the ending of the Dyke at the Wye in a particularly dramatic way, overlooking the Brecon to Kenchester Roman road and the River Wye itself. Much of the frontier further north appears to possess a number of key elements from west to east: a zone of English settlement to the west of the Dyke marking the furthest point forward of the frontier; eastwards from this the north-south corridor through which the Dyke passes, and then eastwards again a 'service zone' behind the Dyke, perhaps with military or further reconnaissance installations; and then to the east yet again a north-south Roman road marking the rear of the zone (and in principle enabling rapid movement of Mercian forces along the frontier).

It is possible to envisage similar components having existed in the valley of the Wye immediately west of Hereford, but with the elements ranged south to north rather than west to east. In other words, the frontier was turned here through a right-angle to run east-west rather than north-south. In these terms, the southern limit of the frontier (and of English settlement) would have been close to Aconbury hillfort south of Hereford; the River Wye would have played the same 'corridor' role as the Dyke did elsewhere; the Breinton earthwork (if it had been in existence by then) located as one of the rearward military installations; and the 'back' of the frontier zone being marked by the Roman Road that had formerly run from Brecon through the walled town at Kenchester, and then eastwards towards Worcester.

Meanwhile, study of the available LiDAR data for the Garnons area near Bridge Sollers has demonstrated why, when Hill and Worthington's team dug two excavation trenches at two different locations close to the parish boundary along the crest of Garnons Hill, they failed to find any trace of Offa's Dyke at all (Hill and Worthington 2003: 137–138).²¹ The LiDAR data now available clearly shows, however, that the course that the Dyke took was not over the summit of the hill at all but some 200m to the west, along the crest not of the hill itself but of its steep west-facing slopes. As the Dyke rose up from the riverbank, it headed for a prominent sub-circular enclosure (also first discovered from the LiDAR data, owing to the heavily wooded terrain) located on the southern end of the Garnons Hill summit ridge. The Dyke then looped around the western perimeter of this enclosure, and proceeded northwards along the scarp-edge, to descend towards the already well-known straight length east of Moorhampton (Williams and Delaney 2019: 8–10; Delaney 2021).

²¹ Site 73 at SO 403 439 and Site 130 at SO 402 444.



Figure 14: Breinton House excavation, September 2018.

14a (above): from the west. Scale 1m. The southern margin of the 20m-broad ditch slopes northwards (to the left), with the tumbled stones from the former bank-facing partially removed to reveal the angle of descent towards the centre of the ditch. The turf-fronted rampart with layered turves is visible to the right. Amidst the tumbled stones were burnt lumps of (furnace?) daub, and sherds of late Anglo-Saxon pottery (Photograph: Keith Ray). 14b (below): to the right (south), clay core of bank with possible post-hole; centre: layered turves fronting the clay bank; left (north): southern lip of the ditch that defined the north side of the fortification, with collapsed stone facing made of river cobbles (the late Anglo-Saxon pot-sherds and burnt clay from corn-driers were found in the soil matrix around these stones). Excavation: Liam Delaney and Keith Ray, with volunteer and professional assistance (Photograph: Liam Delaney)

The Dyke at the Camlad near Hem, Montgomery (SO 233 984 to SO 230 997)

Tudur Davies, Liam Delaney and Keith Ray

The significance of the place name 'Hem' as denoting a key location on the Dyke on the northern margins of the Vale of Montgomery was noted in the *Landscape and Hegemony* book as meaning 'an edge', like the hem of a garment (Ray and Bapty 2016: 278–279).²² As such, it was a significant naming of a place (at SU 230 003) where, if one is moving northwards, the Dyke again approaches the River Severn, here in its middle reaches. When moving southwards, conversely, this is the location where it departs from its course shadowing the River Severn upstream from near its confluence with the Vyrnwy and where it turns away southwards to cross the Vale of Montgomery and then to climb towards the Clun uplands. In these terms it was a significant place geographically and topographically, as well as culturally: in effect for the Mercians the margin of the Anglo-Saxon world.

Immediately below this significant, if subtle, turn, southwards of the ridge where it is performed (with Hem farm 500m to the west and Great Hem 400m to the east), the Dyke traversed the Camlad river, which drains westwards here (unusually, since most rivers crossed by the Dyke flow eastwards). At this traverse, between Pound House (on the north side of the floodplain at SO 230 998) and Devil's Hole, Rownal (on the south at SO 232 985), the earthwork appears to be very slight as it extends up to the present course of the Camlad in either direction (Figure 15). This slightness of scale is an illusion: following the line of the Dyke along the long-distance path, it may not be readily apparent that the path occupies the very crest of the bank: the bulk of the earthwork is submerged beneath the alluvial silts that have accumulated here over centuries.

Just north of Devil's Hole, the Dyke appears to make an oblique crossing of the river. This too, is illusory, since the present course of the river here is not the ancient one, and the river has broken through a formerly continuous length of the earthwork. This much is evident from the study of LiDAR data, that indicates that at least one former course of the river meandered across the floodplain some 300m to the north of its present course (Figure 15).²³ The Dyke maintains the alignment that has been followed at this point for more than 1km north from Rownal, and heads straight for a particular former loop of the river. Here, it was carefully placed to cross the (then) main channel of the river by making a minor adjustment to its course in a segment of less than 50m long. This crucially enabled the earthwork to cross the river course at the perpendicular, before resuming the alignment immediately on the opposite (northern) bank.

²² The suggestion was made (ibid) that the naming was a deliberate reference to this point along the course of the Dyke being perceived by the Mercians, perhaps, as the furthest westerly outpost along the Dyke, facing boldly up the Severn valley into central Wales.

²³ LiDAR representation and geomorphological mapping by Tudur Davies. Separate field visits were made by Liam Delaney and Keith Ray, and subsequently by Tudur Davies and Keith Ray to check these features on the ground.



Figure 15: View northwards towards the hill at Hem, from a point close to where the modern course of the Camlad cuts through the former line of Offa's Dyke. Along the course of the north-south field boundary hedge visible at left-centre is the point where the single palaeo-channel of the Camlad was traversed by the Dyke (Photograph: Keith Ray)

This short, adjusted, length crossing the former main stream is a vital piece of evidence in terms of the most likely interpretation of both the geomorphology and the archaeology. For the geomorphology, it demonstrates that this former stream channel was in existence, and active, approximately 1200 years ago when the Dyke was being built. For the archaeology, it demonstrates not that the Dyke was built across the channel, as much that in some form or another it actually *bridged* across it (otherwise it would not have been necessary to make the kind of angled adjustment that remains detectable today). This raises an important possibility: namely, that the Mercians built a bridge over the River Camlad here, spanning from the northern end of one Dyke length to the southern end of another, and from bank to bank of the stream channel.

This has two further important implications. The first is that it raises the possibility that there was originally some form of walkway along the crest of the Dyke, such that a bridge was deemed an important feature enabling access along these lengths (and inferentially was also a feature likely to have been present in similar situations elsewhere). The implications for the surveillance practices along the whole course of the Dyke hardly need emphasising: a walkway crowning the bank in at least some locations would have provided clear oversight of the country on both sides. The second implication is that timbers forming the foundations of the bridge may be preserved here. This in turn highlights a further potentially crucial eventuality: that it may be possible, ultimately, to obtain a felling date for the timbers and a close calibration of the date of construction of the bridge (and, locally at least, the Dyke itself: unless the bridge was a later addition).²⁴

²⁴ The potential significance of these three aspects cannot be overemphasised. Firstly, if excavation reveals water-logged timbers that can be dated by dendrochronology (Christensen 2003, see also Roesdahl 2008) then a specific part

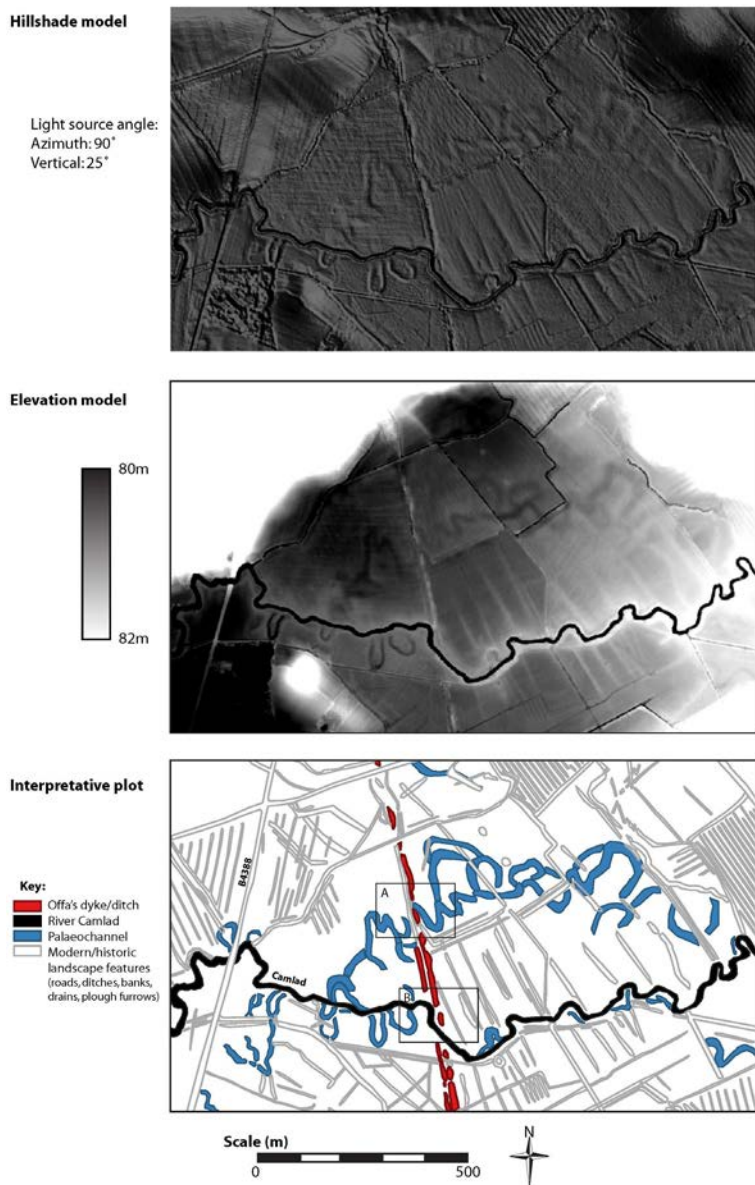


Figure 16: LiDAR-based mapping of Offa's Dyke at its crossing of the floodplain of the River Camlad north-east of Montgomery. The interpretive plot shows how the present-day stream-channel (flowing from right to left here) simply cuts through the Dyke, whereas the Dyke builders made a subtle adjustment to cross the river at the perpendicular at a loop of the former stream-channel.

The three images reproduced here were generated by Tudur Davies.

of the construction of the Dyke may be closely dateable). Secondly, if a bridge is proven to have been present, then the construction of a 'military' Dyke is of a piece with 'bridgework and fortress work', and the means by which the labour was brought to the frontier to build the Dyke is established. And thirdly, if there was a bridge it implies that there was a walkway along the top of the Dyke which enabled Mercian forces or patrols to cross the floodplain here.

A length of the Dyke at Pentre-shannel, Oswestry, Shropshire (SJ 258 273 to SJ 257 277)

Niall Heaton and Keith Ray

In 2019, an inspection was made by the authors of this section of the paper of the particularly well-preserved length of the Dyke located between Pentre-shannel Farm and Trefonen village.²⁵ In brief, three aspects of the site were noted. Firstly, the profile of the bank (standing at SJ 257 275 to a full height of more than 8m above the base of the ditch – as currently partially infilled: it would originally have been deeper) is of the ‘classic’ Offa’s Dyke form: on the eastern side a long slope upwards (westwards) to the crest of the bank and then a steep scarp facing west above the ditch.

The second observation is the presence of a stone capping over the crest of the bank (Figure 17, photo of the bank at Pentre-shannel). These features combined suggests that at this point the bank of the Dyke retains something of its original profile. Such a profile and capping exactly mirrors the form of the well-preserved lengths of the Dyke in Gloucestershire discussed earlier in this article, and this in turn reinforces the conclusion that although separated often by considerable distances from one another, the different lengths were conceived and executed as a single construction project.

The third observation concerns the nature and disposition of construction quarries and the evidence for earth-moving on the eastern side of the bank locally (Figure 18). As the Dyke approaches a slight rise in the ground and crosses a spur of the hill at SJ 2582 2745, satellite imagery dating from 2005 indicates the existence of a distinct oval-shaped quarry (necessarily undated) on the south-eastern flank of the spur only 30m east of the Dyke bank, and other less distinct areas nearer to the back (eastern flank) of the bank itself, but again on the southern flank of the east–west trending spur.

That these quarries are contemporary with the bank cannot be proven, but a further remarkable phenomenon was noted on the ground. This was that the entire central area of the spur directly eastwards from the Dyke had purposely been graded level to a single (reduced) level, presumably when the Dyke was under construction. This is what appears most likely to have happened here, as indicated most directly by the survival of a narrow lip of gravel along the edge of the spur on its north-east facing side, where the levelling incision had been made. The probable explanation for this is that to obtain material with which to raise the bank, the Mercian construction team had not only quarried into the spur but had opportunistically carried out levelling operations upon it.

This reinforces the view expressed earlier (Copeland, Hoyle and Ray, this article) that the work of creating the Dyke, and most especially the preparation of the ground by quarrying to its west, was a sophisticated and considered, rather than hasty, operation. It indicates that the ground was carefully surveyed before construction began. These

²⁵ Accompanied by Andy Heaton and Dylan Ray.



Figure 17: The top of the bank of Offa's Dyke at Pentre-shannel, north of Trefonen (west of Oswestry) showing the remains of a former continuous stone capping (Photograph: Keith Ray).



Figure 18: The view of Offa's Dyke at Pentre-shannel, looking north towards Craig Morda, in May 2018. In the foreground is the area 'shaved level' for material to be placed in the bank of the Dyke (Photograph: Keith Ray)

observations also indicate the need for further, closer and intricate – and perhaps above all, *informed* – survey and recording of the structure of the Dyke throughout its course, but also the selective analytical investigation of particular locations (Pentre-shannel would be a good one), where good preservation means that more information could be gained by excavation of both the Dyke and parts of its immediate environs, designed to answer closely defined questions.

A frontier in the north: Offa's Dyke in Flintshire re-established? (c. SJ 267 578 to SJ 078 838)

Ray Bailey and Keith Ray

The results of work from the 1970s onwards suggested that, despite assertions by Fox and others to the contrary, slight linear earthworks near Walwen, Newmarket (SJ 101 794) Brynbella, Whitford (SJ 130 772) and at Holywell Racecourse, Whitford (SJ 150 755), traditionally referred to as 'Offa's Dyke' (and included as such on Ordnance Survey maps; and see Fox 1955: 13–28) were instead a mix of prehistoric and post-medieval constructions (Hill and Worthington 2003: 154–161; Jones 2008). It seemed likely by 2016, therefore, that the northern terminus of Offa's Dyke was, as had been suggested as long ago as 1781 by Thomas Pennant, at Treuddyn north-west of Wrexham (Pennant 1784). However, the interim conclusion of the new field reconnaissance studies reported formally for the first time here is that there is an alternative possibility. This is that the Dyke was built northwards from Treuddyn, but on a course somewhat to the west than previously envisaged, with an entirely contrasting outlook.

A series of exploratory field excursions to locations in northern Flintshire began in 2017.²⁶ The first site visited was to a boundary earthwork north of a prominent hill immediately adjacent to Acre Wood, just to the south-west of Gronant (SJ 084 821). An area of north-facing fields here has a fine prospect overlooking the Irish Sea, and running downslope northwards there is an earthwork marking the boundary between the civil parochial communities of Prestatyn and Llanasa (Figure 19 a and b).

²⁶ The first visit was made by Keith Ray and Howard Williams early in 2017 to lengths of Wat's Dyke close to (and at) the northern end of Wat's Dyke in April 2017. Keith Ray gave a talk about the 'Landscape and Hegemony' book in Rhuddlan in March 2017. Ray Bailey attended that talk and afterwards questioned the suggestion that there was no authenticated stretch of the Dyke north of Treuddyn. He thought that the accounts of antiquaries that had pointed out the linear earthworks in the Trelawnyd, Whitford and Ysceiog areas needed to be re-examined and re-assessed, particularly in reference to the earthworks on the ground. In September 2017, Ray invited Keith Ray and Howard Williams to visit a location north of Gop Hill (Trelawnyd) and south-east of Prestatyn to inspect a boundary feature that he thought might be germane to an understanding of the frontier.



Figure 19: The earthwork at Gronant in September 2017. 19a (above): looking north, with the remnant bank and partially infilled ditch to right, and the much-spread counterscarp bank to left. 19b (below): looking south, with the massive (but spread) bank left and centre, and the ditch and counterscarp bank (reduced and topped with a fence) to right (Photographs: Keith Ray).



Figure 20: The degraded (or bulldozed) former course of the Gronant boundary descending to the narrow coastal strip (viewed from the south: the beach to the east of Prestatyn is in the background) (Photographs: Keith Ray)

The earthwork along this boundary is much-degraded, but it is possible to observe possible former quarry-hollows to its east, then westwards successively a much-reduced but still substantial bank upon which the field fence has been placed. Westwards again there is an eroded and partially infilled ditch; and, further to the west, the near-continuous spread vestiges of a broad counterscarp bank. Its course is marked by a series of lengthwise segments adjusted to the terrain, and it is traceable for approximately half a kilometre. At a point where the slope steepens markedly, the earthwork disappears (apparently having been levelled), being replaced by a fence-line (at SJ 084 826; Figure 20). Although the former bank is vestigial here, it is potentially instructive to note that it follows a course downslope that features several short lengths whose existence as a continuous earthwork is nonetheless apparently arranged in segments whose positions have been adjusted, length by length.²⁷ If this represents the original northern terminus

²⁷ Subsequent searches by Ray Bailey and members of his 'Offa's Dyke Collaboratory North' group have established that this vestigial course is again to be observed further down the slope in woodland (on west-facing slopes along the western edge of The Dingle woodland). At the foot of the slope beyond the woodland its course is picked up by a modern drainage dyke crossing the narrow coastal strip to the beach at the perpendicular.



Figure 21: The bank at Tan-y-walk, Caerwys. 21a (above): view south over the earthwork sited on the top of a natural bluff. 21b (below): south-eastwards down the valley (earthwork surmounting the slope to the left) (Photographs: Keith Ray)



of Offa's Dyke, it could not have been more spectacularly sited, descending steeply from a point close to the highest summit in the hills directly overlooking the Point of Ayr to Prestatyn coastline.

A further visit was carried out to examine a feature that was shown on the Ordnance Survey 1:25000 scale map to exist north of Caerwys. This appeared potentially to be a linear earthwork facing south and aligned north-west to south-east along the top of a natural scarp. It appeared to descend eastwards down a slope to cross the valley north-east of Caerwys. Although some c. 10km south-east of the southern end of the 'Gronant' earthwork this linear feature at Coed Tan-y-walk in the close environs of Caerwys Hall (SJ 133 736) was considered to be well-located to pick up a route running southwards that Offa's Dyke might be expected to follow.

It was considered at least possible that the Tan-y-walk earthwork (Figure 21) was in origin some kind of enclosure bank such as is common for a medieval or later deer park boundary, or pale. If so, it might be expected to follow a course that in some way (partially at least) encircled the Hall. However, the apparent absence of the rest of the 'circuit' of such a pale argues against this. Meanwhile, it appears to do exactly what we might expect the Offa's Dyke linear earthwork to do when approaching the valley of the Caerwys Brook: namely, to turn inwards (eastwards), to make the crossing before swinging around southwards to take advantage of the steep west-facing slopes facing Caerwys village. Further survey will be needed to attempt to trace its former course on the south/east side of that valley, directly eastwards from Caerwys village.

Even if the Caerwys Hall earthwork was other than a former park boundary earthwork, it was realised that it hardly filled the 'blank' that still existed in a projected approximately 30km line of the Dyke between Gronant and Treuddyn. It seemed reasonable therefore to speculate that if the Offa's Dyke earthworks that have been recorded in the landscape to the south of Treuddyn were also heading north from the east-west ridge across which that settlement is spread, there was no reason to suppose that they would, as Pennant had suggested, have been heading for the Clwydian Hills overlooking the Vale of Clwyd from the east.²⁸ Surely, the Dyke would have continued to follow a direct route northwards, heading for the place chosen to mirror the southern 'flourish' at Sedbury by Chepstow with an equivalent dramatic northern terminus near Gronant?

The broad valley basin now mostly occupied by the town of Mold is clearly laid out when seen from the south at the eastern limits of Treuddyn. The valley is oriented north-south, with the River Alyn flowing southwards along its northern margins. It is evident

²⁸ Somewhat hopefully, Ray and Bapty (2016) had suggested that the former northern course of Offa's Dyke was actually the same earthwork later identified as Wat's Dyke in the Northop area and extending 'to the Dee estuary' at Basingwerk. This was in part based upon local namings of Wat's as Offa's Dyke: a confusion easily understood given their proximity. In light of the recent fieldwork noted here, it seems more sensible to reject that possibility.



Figure 22: The massive west-facing bank (right) extending from the road between Mold and Cilcain for a distance of more than 400m at Llanerch, Rhual (Mold), viewed from the south-east. The bank clearly faces south-west here. Its continuation northwards to Benllan lies just beyond the trees on the horizon in this view (Photograph: Keith Ray)

that any potential course of the Dyke northwards would have to cross the River Alyn to the west of Mold at an optimal location to achieve exclusion while offering a convenient route northwards. A promising location for the location of a southern approach to this valley crossing was identified a mile to the north-west of Mold, at Llanerch close to Rhual mansion (at approximately SJ 217 647).²⁹ This location was chosen for two reasons: firstly, to determine whether the Dyke crossed the place here where the Alyn emerged from a steep-sided narrow valley into the broader valley around Mold, and secondly, to follow a route that would most likely provide the best surveillance over the hills that rise westwards towards Nercwys Mountain. Extraordinarily, although there had been no prior indication that such a feature existed here, the location chosen proved to be bordered to the east by a massive 3m-high linear bank (Figure 22).

This feature was traced southwards from Llanerch (at SJ 216 647) for more than 400m but could not be found in the shallow valley bordering Maesgarnon Farm at SJ 217 643. However,

²⁹ This location was selected by Keith Ray as a line on the map following a public footpath, that could easily be visited and checked on the ground. In late September 2018, therefore, another meeting with members of the by then burgeoning Flintshire 'Offa's Dyke Collaboratory North' group was arranged, to look at this and other locations nearby. The visit was repeated the following Spring (in snow) this time accompanied by Howard Williams.



Figure 23: The linear earthwork at Pen-y-garth, south of Rhydymwyn looking south-west in the direction of Mold. The person on the left is standing behind the putative bank (the latter located at centre, surmounting the natural south-facing scarp here); while the person on the right is standing in the largely silted-up ditch with the counterscarp bank behind them (Photograph: Keith Ray)

even cursory examination of both satellite imagery and aerial photographs has indicated the presence, less than a kilometre to the south (at SJ 224 634), of what looks like a straight linear ditch running for half a kilometre southwards on a north-west to south-east trajectory (to approximately SJ 227 628. This ploughed-out feature is bisected by the A5119 road into Mold, just north of its intersection with A494 Ruthin to Connah's Quay trunk road).

Across the road northwards from the bank noted above at Llanerch (by the Pantymwyn–Mold road: SJ 216 647), the line of the earthwork is followed by a track (initially, from the south, placed along the top of the bank) at Benllan. As the track (and the bank) approaches the crest of the north-facing slope overlooking the Alyn valley, the bank again reaches massive proportions: first in a hedgerow bordering (on its north-eastern side) the access track to the Benllan cottages (at SJ 215 650, to the north-east), and then in woodland (also to the north-east of the track) down the north-facing slope here (SJ 216 651). As it descends the north-facing valley slopes obliquely here, it is hidden amongst the undergrowth: although it formerly had an impressive prospect north-westwards up the Alyn valley and across the river.

Where it reaches the valley bottom, it crossed the river at the perpendicular (at SJ 217 653) modern land-use has removed it for the most part here). Beyond this, its route is marked by a segmented hedge-line climbing up the steep south-facing hillslope above



Figure 24: The linear earthwork at Nannerch. 24a (above): looking north-east from the west end of Nannerch village, the bank is ranged along the top of a south-facing scarp, to some degree obscured by modern hedgerow and trees. 24b (below): the view north-west towards the same south-facing scarp across the driveway to Piw Gwyn Farm: the bank surmounting the scarp at right-centre (Photograph: Keith Ray)



the river. Having climbed the slopes northwards, it makes a sharp north-westwards turn (at SJ 216 654) before continuing as a broad eroded earthwork (nonetheless featuring quarry scoops, a broad bank, broad but mostly infilled ditch, and outer lip representing the counterscarp bank), along the top of the south-facing scarp overlooking the Alyn (Figure 23). Entering Coed Pen-y-garth woodland from the south-east, it follows a south-facing scarp-edge deploying what can be termed the ‘scarp’ mode of construction (to SJ 214 655; see Ray and Bapty 2016: 170–171, for the definition).³⁰

Northwards of this, in the Rhydymwyn area, boundary hedges can be observed that extend beyond the limits of individual fields and that broadly follow the contours of south-facing slopes in a flat-bottomed valley linking the Alyn and Chwiler valleys. These continuous or near continuous hedge-lines run northwards and then westwards between SJ 210 668 and SJ 200 678 before being lost to quarries in the Hendre area westwards towards Nannerch.

Some indications of a formerly more massive linear earthwork exist on west-facing slopes near Gelli 1km south-east of Nannerch village (for instance visible as a linear lynchet at SJ 172 686). The watershed valley curves northwards and then westwards and the west-facing then south-facing slopes along a half-mile stretch here feature a near-continuous boundary marked by a hedge over a pronounced linear lynchet that is sometimes capped by a massive bank. All this distance it overlooks Nannerch village from the opposite (northern) side of the valley (Figure 24).

To the west again, a sand and gravel quarry has removed (and continues to remove), the south-facing slopes to a point above Sarn Farm south of Ysceifiog village where Swan Wood covers an east-trending spur running parallel with, but some 150m above, the valley-bottom. Within Swan Wood a linear bank unrelated to existing land parcel boundaries mostly occupies the crest of the ridge for nearly half a kilometre (from SJ 153 707 to at least SJ 150 708, and beyond). This bank is broad and in places stands as high as 2.5m. It has the characteristic profile of Offa’s Dyke, with a long slope up the rear (here, north-facing) side of the bank, and a sharp steep scarp facing forwards and looking southwards over the lip of the natural scarp down to the valley below (Figure 25).

Where it is possible for the bank to occupy ground directly above the south-facing scarp it does so: providing clear sight lines down to the valley-floor south-westwards. From this point it is likely to have followed a curving route north-westwards to occupy west-facing slopes near Trefraith overlooking the south-trending valley east of Caerwys village (at SJ 134 730). Just north of here, it may have turned westwards to plausibly link up with the Coed Tan-y-walk length described above.

³⁰ Comprising a slight bank along a scarp-top, artificial scarping of the west-facing slope beneath this to make the bank appear massive when viewed from the west, slight ditch at the foot of this slope, and a modest counterscarp bank beyond this.



Figure 25: linear bank in Swan Wood, above the Chwiler/Wheeler valley. 25a (above): looking south-east along its line, valley to right. 25b (below): looking westwards, earthwork bank to left (Photograph: Keith Ray)



The length of bank at Coed Tan-y-walk is sited only half a kilometre north of Caerwys village. Its orientation is south-east to north-west, and a projection along this alignment for around 7km north-westwards would reach a point at an ancient farmstead 2km south of Gop Hill. This farmstead has for at least 500 years been named ‘Terfyn.’ In the Welsh language this word means ‘an end, or a boundary’ (Evans and Thomas 1987: 408).³¹ Whether the course extended around the east or west side of Gop Hill is unknown, nor is it impossible that it ascended that prominent (251m OD) hilltop. In whichever case, it is likely that, to reach the hilltop at Acre Wood, it would have followed a course c. 1km to the east of Gwaenysgor village.

To recapitulate, reconnaissance survey in central and northern Flintshire has involved a series of observations concerning lengths of possible linear earthwork that share several characteristics of Offa’s Dyke occurring elsewhere. These are beginning to chart, at least in outline, a plausible northernmost course of Offa’s Dyke, north of Treuddyn. The degree to which such a course mirrors (or shadows) the course of Wat’s Dyke (often consistently 2.5km to the east) is remarkable. If the identification of a northern series of lengths of Offa’s Dyke here is correct, this geographical separation remains constant over considerable distances (see below).

The implications of this potential identification of a northern course to Offa’s Dyke between Treuddyn and the sea are enormous, and will be discussed further in the concluding section of the paper, below. It is not only the existence of the Dyke here that is of importance, but also its course. The location of any crossing of the Alyn was bound to be significant, since this is the largest river that is largely contained within the county. However, what is of especial interest is that once this is achieved, the low-lying valley that ultimately connects the Vale of Clwyd with the north Cheshire Plain is followed until a point is reached south of Caerwys where there is an opportunity, topographically, to alter course northwards.

This is the kind of choice made by the ‘designers’ of Offa’s Dyke time and again along its course. This correlation, together with the frequent scarp-edge siting and the structural form of the linear earthworks identified in northern Flintshire between 2017 and 2019 provide quite compelling support for the identification of a once-continuous northern course of the Dyke (Figure 26). However, only further fieldwork and investigation will, cumulatively, provide the firmer evidence to support, or to disprove, this possibility.

Conclusion: markers along the ‘continuing journey’

The focus of this article has been on the specific characteristics of a series of locations, and of surviving (if sometimes badly eroded) linear earthworks: whether in terms of presence/absence of Offa’s Dyke or the details of its siting, design and construction. It is arguable in this context, nonetheless, that this still evades the central question of

³¹ Further ‘terfyn’ placenames have been researched by the ‘Offa’s Dyke Collaboratory North’ team. A prominent example exists at Terfyn Hall, which is located 500m east of the line of the earthwork descending to the Irish Sea between Gronant and Prestatyn, and where the location directly overlooks the narrow coastal plain.

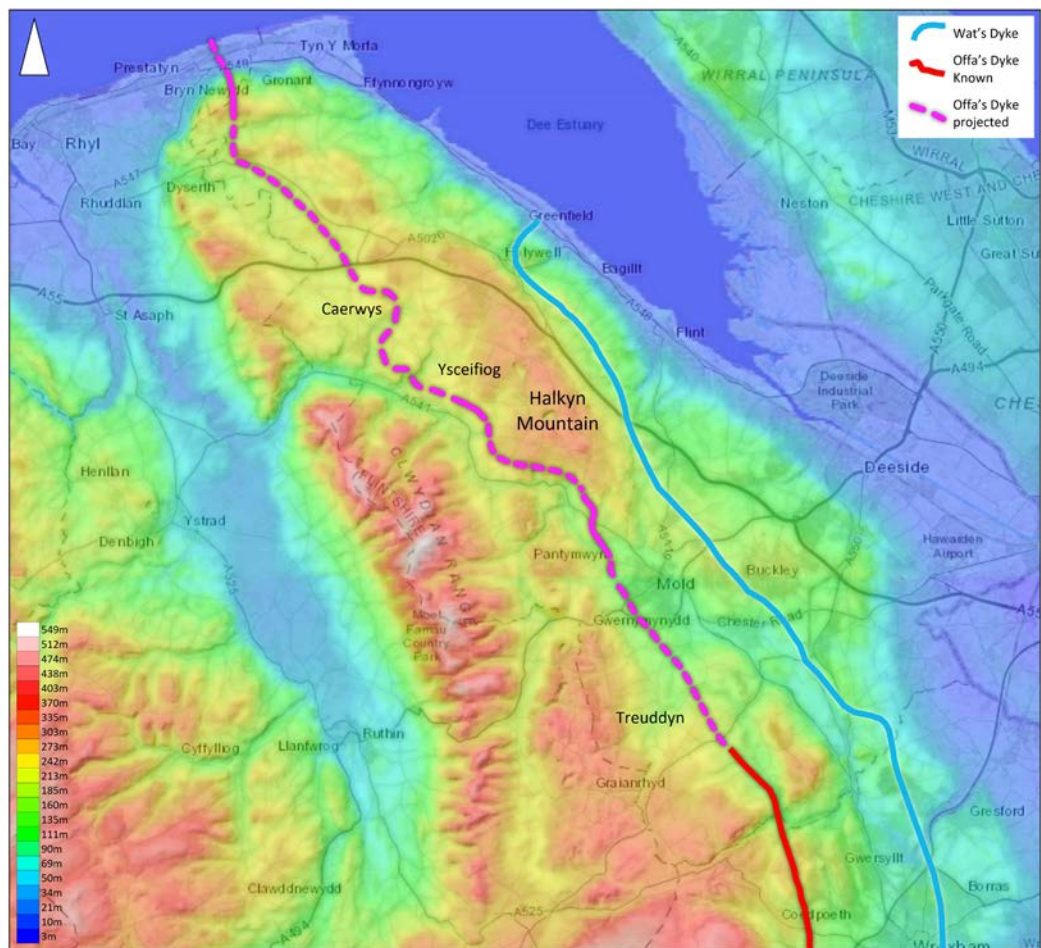


Figure 26: The lengths of 'putative' Offa's Dyke traced, and projected, in central and northern Flintshire, mapped alongside the known lengths of both Offa's Dyke (south of Treuddyn) and Wat's Dyke (mapping by Simon Mayes, designed by Keith Ray)

why the Dyke was built as and where it was. Here it is helpful not to focus solely upon its westwards-looking stance, but to envisage it as having constituted a key part of a particular process: that is, the transformation of a hitherto ill-defined borderland into something approaching a formal frontier, and more particularly, a *march* (Ray and Baptý 2016: 344–350).

The insistence upon a line that deviated as little as possible from a strictly north-south course indicates the intention to define once-for-all what was Mercia as distinct from the lands occupied by the Welsh kingdoms to the west (that were nonetheless regarded as potentially subject to future Mercian domination). The purpose of a march (a concept in the later eighth century already taking material form in the Carolingian domains) was however to serve as a frontier *zone*, which might be narrower or wider at different places and times (Ray and Baptý 2016: 344–353). The central element of such a frontier was

unquestionably the Dyke itself, so that the border was both rigid when it needed to be, and permeable at other times. Among other things this enabled Mercian armies to campaign westwards when deemed necessary or desirable but inhibited retaliatory raids eastwards.

So, the frontier was a complex entity, for which the linear earthwork was itself but the principal component. The further importance of the Dyke was twofold. Firstly, it created a potential source of revenue for the King, his regime and especially for the emerging Mercian state apparatus. The mention of frontier ‘customs posts’ in the hugely more extensive surviving Carolingian documentary record explains very clearly what may have been intended to happen also in contemporary Mercia (Ray and Baptý 2016: 347, citing Smith 1995). And this is the main reason why there most likely were indeed gateways through the earthwork serving as toll-places, and why these were in some cases complex pieces of border infrastructure, as at Hergan in Shropshire (Ray and Baptý 2016: 236).

Secondly, the Dyke not only made manifest the power of the Mercian kingdom in its physical scale and scope, but also in the colossal mobilisation of men and materials involved. It thereby impressed upon the wider consciousness (in Wales, along the frontier itself, within Mercia, among its allies, and among its rival kingships – including on the Continent), the organisation, cohesion, vision, innovation, determination and military capability of the Mercian regime and its forceful King. And it is in these terms especially, that Asser’s allusion to the Dyke (Keynes and Lapidge 1983: 71) needs to be read: even a century on, the Dyke could be regarded as a product of ‘recent times’ and stand as an adequate metaphor for Offa’s aggressive dominance and oppressive power.

The various observations described and discussed in the foregoing text each need to be followed up with detailed investigation and recording since they are so far the product only of reconnaissance visits and so their results at this stage must be regarded as provisional. Nonetheless, it is perhaps worth reviewing, briefly, the picture that they are cumulatively providing in terms of a number of interim conclusions (Figure 27).

The claimed possibility (at present of course requiring much further investigation to be certain) that far from ending, always somewhat inexplicably, at Treuddyn, Offa’s Dyke continued northwards to the sea just east of Prestatyn is a remarkable one to make, given the length of time across which the ‘basic facts’ concerning Offa’s Dyke have been rehearsed and debated. One extraordinary aspect of such a course as projected here is that between a point just north of Nercwys village (around SJ 235 617) and a point north of Rhydymwyn on the River Alyn (at roughly SJ 209 675), Offa’s Dyke would have run for more than 7km on a south-east to north-west orientation *almost exactly parallel with*, but just under 5km west from, a 7km-long stretch of Wat’s Dyke running from near Penyffordd (SJ 298 607) northwards as far as Mynachlog west of Northop (SJ 233 683).

At this point, Wat’s Dyke turns abruptly northwards at just the latitude that, those only 3km to the west, Offa’s Dyke may have made an equally abrupt turn westwards. What

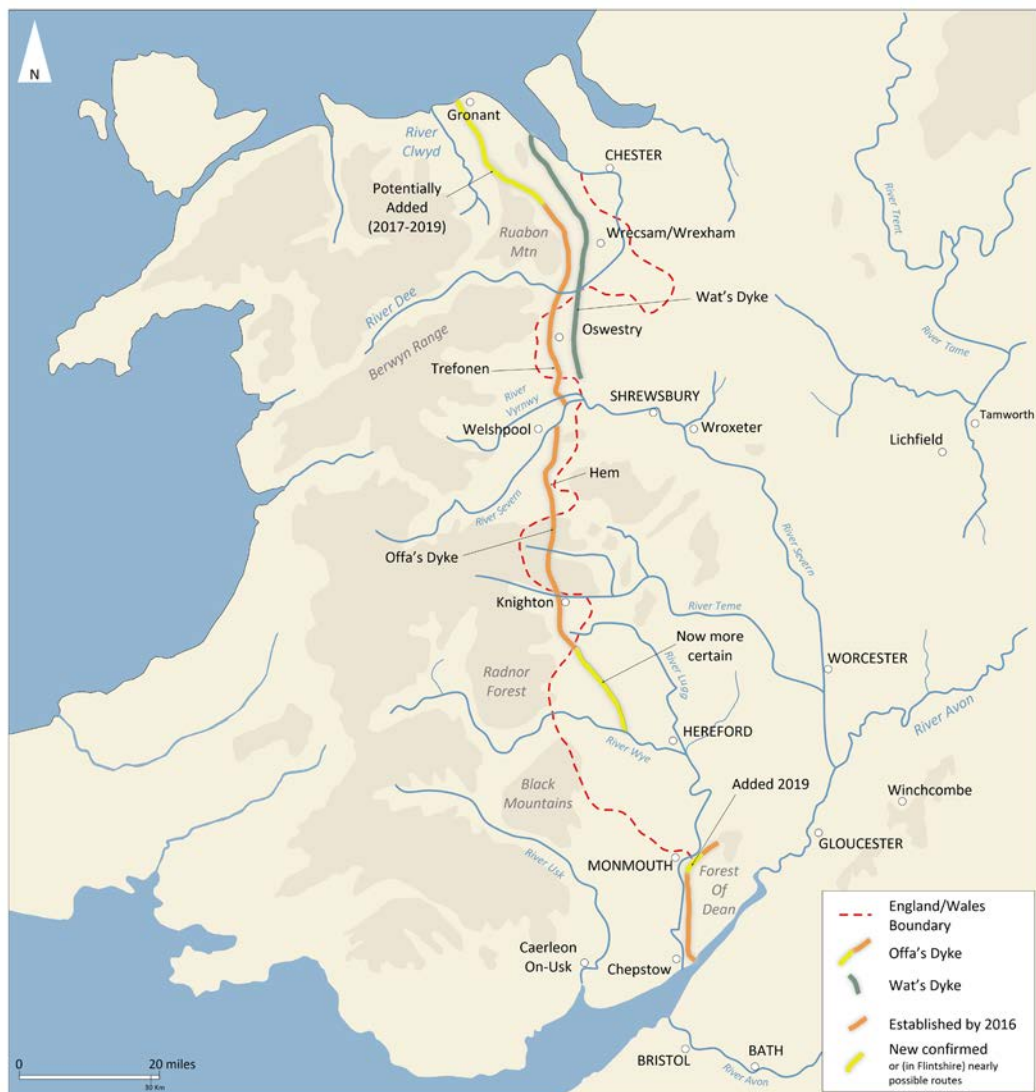


Figure 27: The status of current understanding of Offa's Dyke and Wat's Dyke as a result of field reconnaissance efforts between 2017 and 2020. Map redrawn by Simon Mayes

this would have created was an enormous 'funnel' between the Dykes with each broadly running parallel with the other but a short distance apart, extending from the 'mouth' of the funnel in the Rhosesmor area at the southern end of Halkyn Mountain southwards for a distance of around 30km to a point near Ruabon where they were situated only 1km apart.

Two further questions emerge from this discussion: why was the putative frontier zone expanded to engulf the broad Halkyn Mountain ridge? And, what relation did the two dykes have with one another? For the first, there is an important likelihood that the

Mercians may have developed an interest in the mineral resources of Halkyn Mountain, which since at least Roman times had been producing lead. In order to place the latter resource firmly within the Mercian domain, the preferred routing for Offa's Dyke would have taken it from the high ridge at Treuddyn directly northwards to the River Alyn west of the later medieval town of Mold, before following its tributary stream the Afon Chwiler north-westwards towards Caerwys and then directly northwards towards the coast.

In view of this lead-related and economic dimension, there is a helpful correspondence with the reference in Thomas Churchyard's extended poem, *The Worthines of Wales*, published in 1587, to this area between the dykes as 'free ground' that had traditionally served as a neutral trading zone between the English and Welsh. Close inspection of the text of the relevant stanza suggests that this was a negotiated zone with agreed terms for trade and agreement also over the consequences of unauthorised movement eastwards or westwards beyond it.³² As was noted in another recent paper, this raises the possibility not so far considered at all, that the two dykes, instead of being of different dates, were in fact used, if not necessarily built, at the same time (Ray 2020: 130).

As this long article reaches its ending, the potential of a very different observation reported here to transform our understanding of the Dyke needs perhaps to be emphasised. This is the ostensibly simple observation, arising from LiDAR data and expertise in the mapping of geomorphological features on the part of Tudur Davies, that there is a crucial adjustment in the route of Offa's Dyke as it crosses the floodplain of the Camlad north of Montgomery.

This is at the point where the Dyke approached the former principal channel of the river. Firstly, if excavation reveals waterlogged timbers that can be dated by dendrochronology (a bridge in Denmark was dated to Harald Bluetooth's reign in this way) then a specific part of the construction of the Dyke may be closely dateable.³³ Secondly, if a bridge is proven to have been present, then the construction of a 'military' Dyke would have been of a piece with the 'bridgework and fortress work' of the Mercian charters from Offa's and Coenwulf's reigns. In this way, the mechanism of obligations of service to the regime by which the labour was brought to the frontier to build the Dyke could be regarded as

³² The stanza of the poem 'Worthiness' concerned reads: 'Within two myles, there is a famous thing;/ Cal'de Offaes Dyke, that reacheth farre in length:/All kind of ware, the Danes might thether bring,/It was free ground and cal'de the Britaines strength./Wat's Dyke, likewise, about the same was set,/Betweene which two, both Danes and Britaines met/And trafficke still, but passing bounds by sleight/The one did take, the other prisoner straight.' Cyril Fox (1955: 226) noted the existence of the stanza concerned, but simply observed that it was 'the earliest reference to Wat's Dyke as a distinct structure.'

³³ Whether this would produce a date in Offa's or Coenwulf's reign is less significant than tying the construction to a particular decade. If in Coenwulf's reign it would not necessarily 'prove' that the Dyke was built by Coenwulf and not by Offa: rather it would certainly demonstrate that it was in use in Coenwulf's time. Nor, of course, would it prove the construction of the Dyke everywhere dated to that period.

established. And thirdly, if there was a bridge it implies that there was a walkway along the top of the Dyke which enabled Mercian forces or patrols to cross the floodplain here. At one place, it would be possible, therefore, to move discussion along substantially concerning the date, the means of building, and the functioning of the Dyke.³⁴

As for the southern extremities of the Dyke in Gloucestershire, again there appears to have been a carefully executed tactical plan to deny the Welsh communities of Archenfield in southern Herefordshire access to the Forest of Dean, its iron ore and its ironworks. The continuation of the Dyke eastwards along the Wye Valley here finds its equivalents at various points along the course of the Dyke and frontier. Such brief east-west stretches no doubt reflected the political circumstances of the building of the Dykes, and they occur three times in the environs of Herefordshire. The other two instances are the frontier that existed without the Dyke along the Wye valley to the west of Hereford, and the curious turn of the Dyke eastwards along Herrock Hill and Rushock Hill towards the River Arrow in the far north-west of Herefordshire. In each case, it can be suggested that the need for surveillance was the key reason for the adjustment of orientation.

Where does this leave our overall understanding of the Dykes and the frontier? For one thing, we are beginning to become more fully aware of the complexities not only of the Dykes as structures, but also of the frontier as comprising both a varied and a dynamic political and cultural entity. If we compare the map of the frontier as envisaged in terms of the known extent of the Dykes in 2016 (Figure 1) with a re-casting of this map in light of the recent fieldwork (Figure 27) the difference lies not only in the lengths of the principal linear earthworks now known, or suspected, to have existed. It is also clear that we can now envisage a frontier that was *zoned*, from north to south. This zonation was itself undoubtedly complex (addressed by Ray 2020).

A glance at this 'new' map indicates that at least four major contrasts appear to exist from north to south. The frontier in the north was bounded to west and east by each of the two Dykes, and extended southwards from two different points on the north coast to a location close to the course of the River Vyrnwy south of Oswestry. The frontier in the centre spanned the whole distance southwards from the middle reaches of the River Severn near Welshpool to Bridge Sollers on the River Wye west of Hereford. The frontier south of Hereford still appears to have no Dyke present at all, perhaps due to the existence of treaty relations between the Kingdoms of Mercia and Ergyng. Here, the River Wye may have stood proxy for the existence of an earthwork. The frontier in the south was again marked by a huge and imposing linear work, in this case as much to mark off the Forest of Dean as a Mercian (royal?) possession, along with its ironworking industry,

³⁴ This surely also enhances the importance of promoting and funding an intervention archaeologically, albeit in potentially difficult (waterlogged) conditions, to examine this location through controlled research excavation.

as to confront the undoubted might of the Kingdom of Gwent to the west of the River Wye. Why the frontier took the form it did in the centre and north is a matter for future speculation. Yet, the co-existence of Offa's Dyke and Wat's Dyke represented to an extent an unstable compromise. Tensions, not only between Mercia and Powys but also Mercia and Gwynedd, seem likely in light of the number of recorded battles between Mercian and Welsh forces along the North Wales coast in the early ninth century.

Finally, the work reported here once again serves to remind us we are only now close to the end of the *beginning* of the journey of discovery and continual re-assessment of this complex and diverse frontier. It will be important in future years to harness many people's enthusiasm, and the financial support of many organisations and institutions, to fuel the ongoing process of discovery.

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Utilising Lidar Survey to Locate and Evaluate Offa's Dyke

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The enigmatic and gigantic Offa's Dyke has long been understood as a demonstration of the power of the Mercian state in the long eighth century. Despite this, rarely have previous studies involved anything more than the visual observations of the earthwork. Moreover, ground-level perspectives cannot possibly contextualise its total breadth and character. The shortcomings in the resulting quality of data on the Dyke has led to uncertainties and debate over its route, extent, and placement in the landscape. With the application of lidar and other digital technologies, my ongoing doctoral research is providing a fresh understanding of the nature and original extent of Offa's Dyke's route by the creation of an accurate and empirical dataset. This digital dataset for Offa's Dyke is identifying hitherto unknown sections of the monument. Furthermore, it is providing the foundation for new investigations of the nature of the frontier in the eighth century by creating the basis for new investigations into the placement and landscape context of the monument. This article presents interim results on the investigation of the Herefordshire section of Offa's Dyke, a stretch that has been among the most problematic and poorly understood from all sections of the earthwork. This study thus provides fresh perspectives utilising digital heritage tools and data sources to examine and re-evaluate evidence of the nature and extent of the monument and the wider Mercian frontier.

Keywords: GIS, Herefordshire, Lidar, Landscape Archaeology, Offa's Dyke

Introduction

The route of Offa's Dyke survives running roughly north–south following the topographical border between Britain's western highlands and eastern lowlands through the modern administrative areas of Flintshire, Wrexham, Shropshire, Powys, Herefordshire, and Gloucestershire. Nevertheless, combinations of natural and deliberate destruction alongside dense woodland results in limited visibility hindering detailed terrestrial survey. Ambiguity persists over the presence or absence of the earthwork, the antiquity and significance of 'gaps' in the route (Fox 1955: 170; Noble 1983: 44), or indeed where the monument really was a continuous construction (Ray and Bapty 2016: 285–288). In the far north, there is ongoing debate regarding how and to what extent Offa's Dyke continued through Flintshire towards the Dee Estuary and the Irish Sea (Ray 2020, 2021).

These issues are pertinent in Herefordshire where there are only smaller segments of linear earthworks surviving separately between Rushock Hill and the River Wye (Figure 1) (Fox 1955: 174–182; Ray and Bapty 2016: 285–288). These disparate lengths – along with no recorded presence in the Herefordshire Plain and South Herefordshire – coupled with the revaluation of the Whitford Dyke (Hill and Worthington 2003: 156; Jones *et al.* 2013) were the basis of a theory declaring that Rushock Hill was the southern terminus

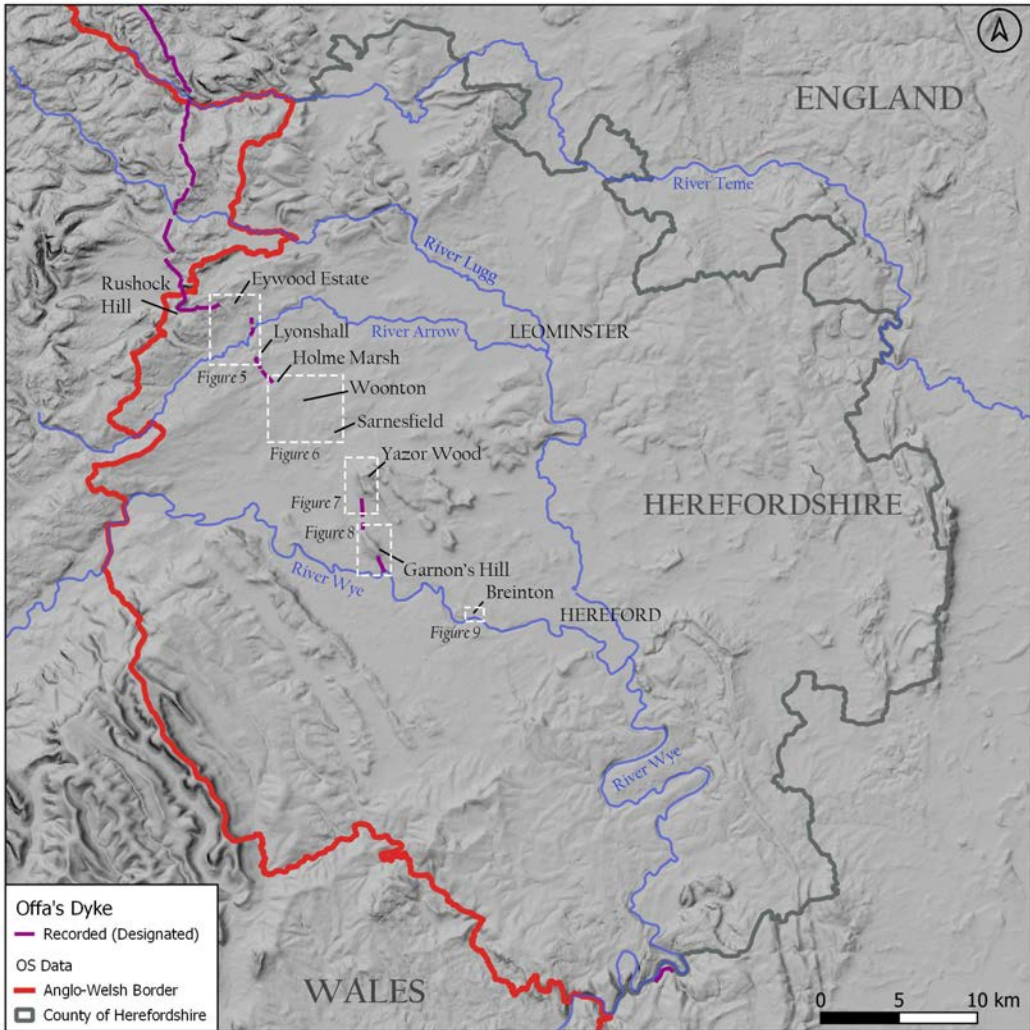


Figure 1: Plan of Offa's Dyke in Herefordshire with locations along the route mentioned in this paper. Illustrated is the recorded existence of Offa's Dyke in the current available data, prior to the lidar survey outlined in this paper (Base Map: Hillshade)

of Offa's Dyke and thus stretches of linear earthwork further south were unrelated (Hill and Worthington 2003: 107). Although extensive field observations tackling that model indicated a continuity of build practices across extant segments over the entire route (Ray and Bapty 2016: 164–213, 335–336), debate over the nature of the gaps in the route linger (Belford 2017: 75–77). In summary, there is still no exact consensus for the route, or in places the existence of, Offa's Dyke in Herefordshire. Given this situation, it remains difficult to conclusively study a monument without knowing its likely full extent, this Herefordshire stretch is a crucial zone demanding further investigation.

The ramifications of this study extend beyond academic questions regarding early medieval linear earthworks: they pertain to modern practical heritage issues over the

conservation and management of Britain's longest earthwork. Sections which are not formally recognised as part of Offa's Dyke are among those at greatest threat from accidental or deliberate damage. Moreover, the COVID-19 pandemic has demonstrated that Offa's Dyke still has a significant place in the popular consciousness and political discourses of modern Britain. The differing legislation and guidelines between Wales and England led to Offa's Dyke being mistakenly and rhetorically presented as the physical manifestation of the Anglo-Welsh border (Smith 2020; Williams 2020: 12). One of the issues that stems from this common misunderstanding is the considerable ambiguity over the exact route and placement of the monument in which the modern border, the Offa's Dyke Path National Trail, and stretches where the monument survives as an earthwork are frequently conflated and confused (Fox 1955; Hill and Worthington 2003: 47–50; Ray and Bapty 2016: 29–54; Ray 2020). Such public misconceptions thus match, and are arguably fostered by, the ongoing academic uncertainties regarding the precise extent and character of Offa's Dyke.

Set against this popular awareness but widespread confusion, this research attempts to better understand the route, placement, and form of Offa's Dyke in its entirety, contextualising the monument in relation to the landscape. Using digital modelling to better understand the monument's route and placement, it may be possible to garner insights into what dictated decisions over its construction and use. To this end, I focus on exploring Offa's Dyke in Herefordshire through lidar survey (Figure 1).

Methodology

Utilising lidar data in archaeological survey has proved to be an effective tool to add detail to surveys. Such data reveals aspects of the landscape that have evaded traditional terrestrial or measured survey. By controlling the light source aspects, the landscape can be seen in shadows cast along the lidar models, revealing earthworks and other features which are not always visible on the ground.

The significant advantage of utilising lidar is the ability to strip away dense vegetation cover (Bennett *et al.* 2013: 197–206), this aspect reveals even heavily degraded features, including those with next to no surface expression. The effectiveness of lidar survey has already been proven before on Offa's Dyke, where previously unrecorded segments of the Dyke were identified through Wyeseal Wood, and north-east of St Briavels (Hoyle 2008: 77, 96, 120). In my own ongoing research, the Camlad floodplain between Shropshire and Wales is a great example of a preserved length without apparent surface expression now revealed by lidar (Figure 2; Ray 2021). Meanwhile, the identification of Offa's Dyke through Leighton Woods, Powys, is an instance of this method's application to better discern the monument's route through dense woodland (Figure 3).

In the UK, lidar data is accessible through the Environment Agency who are in the process of making available 1m resolution lidar for the whole of England and Wales

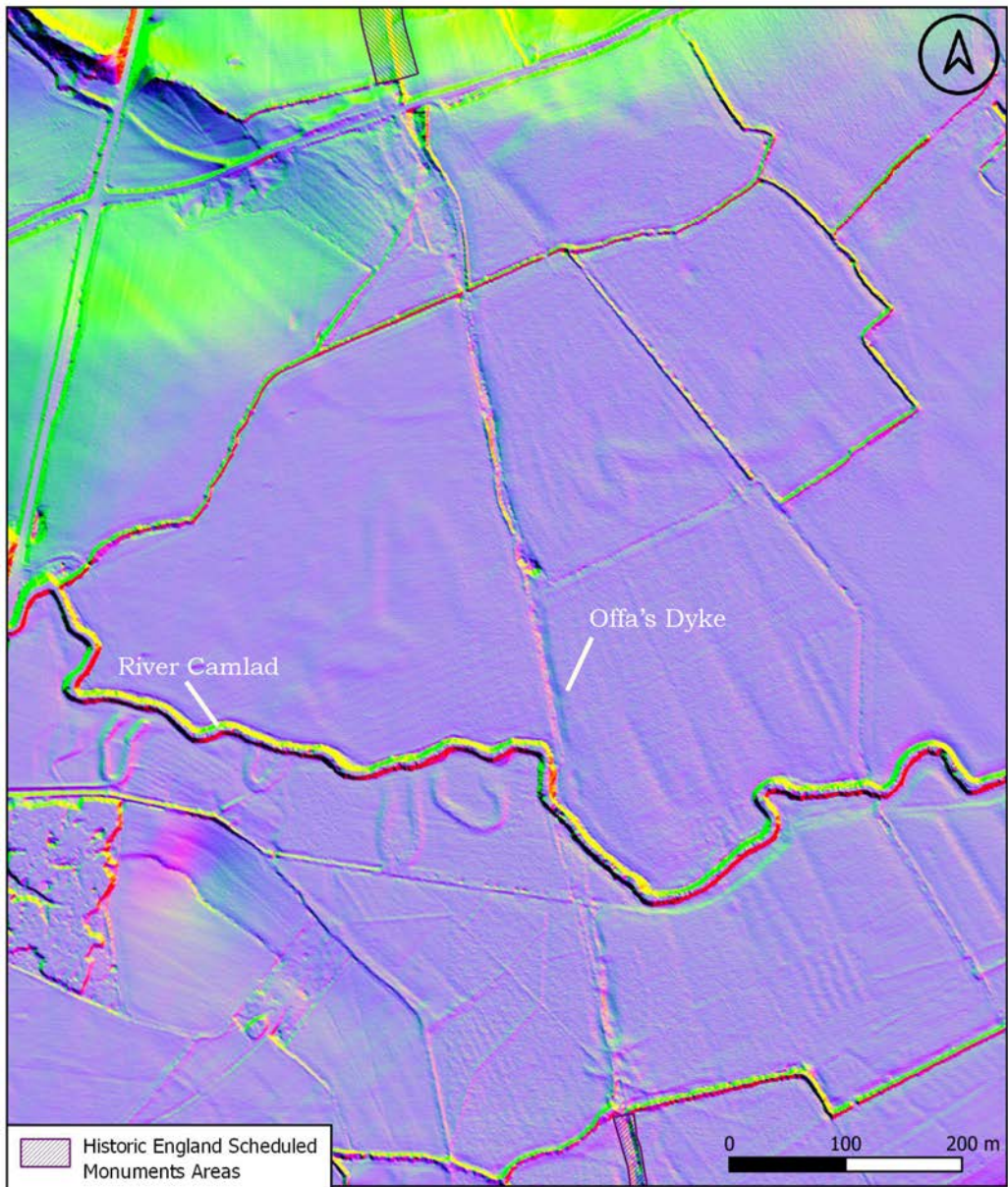


Figure 2: There is almost no visible trace of Offa's Dyke over the Camlad floodplain despite there being two scheduled extant segments either side of it. On lidar a continuous trace can be seen running between these two areas and navigating the Camald crossing. The floodplain has likely silted up around the dyke itself, leaving it intact, which could preserve some interesting elements if we were able to undertake some exploratory excavation (Base Map: PCA)

(Environment Agency 2021). In utilising this valuable resource, it is possible to systematically record the entirety of the monument digitally for the first time.

The Environment Agency lidar data for Herefordshire was downloaded, processed, and then analysed using QGIS 3.18 in 5km² blocks as per the OS Grid. At the time of the

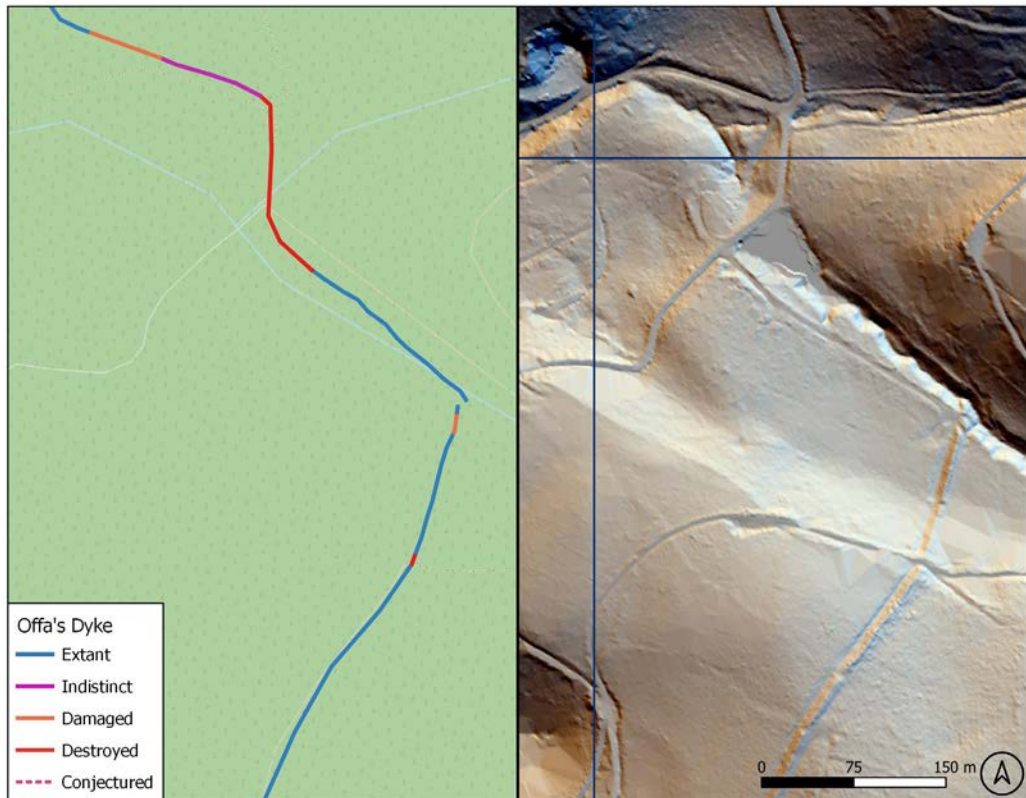


Figure 3: Fox was never able to trace the route of the Dyke through Leighton Woods, where thick post-medieval plantation made terrestrial survey incredibly difficult. However, the lidar data clearly reveals that as the Dyke enters the wood to the north, it has been destroyed by later landscaping but survives parallel to the watercourse before taking a right-angled turn heading south (Base Map: OpenStreet Map/Multi-Hillshade)

survey being undertaken Herefordshire has now largely 1m resolution though the study area of the Dyke, although there are small areas still with 2m and a large gap in the Herefordshire Plain where lidar has yet to be flown.¹ Where there are segments without lidar coverage these have been presented here with observations retrieved largely from Aerial Photography and Historic Map regression. It should be noted that this method is inferior to lidar study which means these interim results should be considered with a lower certainty of confidence.

The Digital Terrain Model (DTM) visualisations were created through RVT 2.0 tools (Kokalj *et al.* 2019) whilst alternative visualisations were also used during the mapping. It was found that an optimal mix of different visualisations could be used to enhance the

¹ This should only be seen as an interim solution; when the 1m lidar data is available this will be updated in the doctoral research. I felt it pertinent to present results in their current form to demonstrate the effectiveness of remote survey.

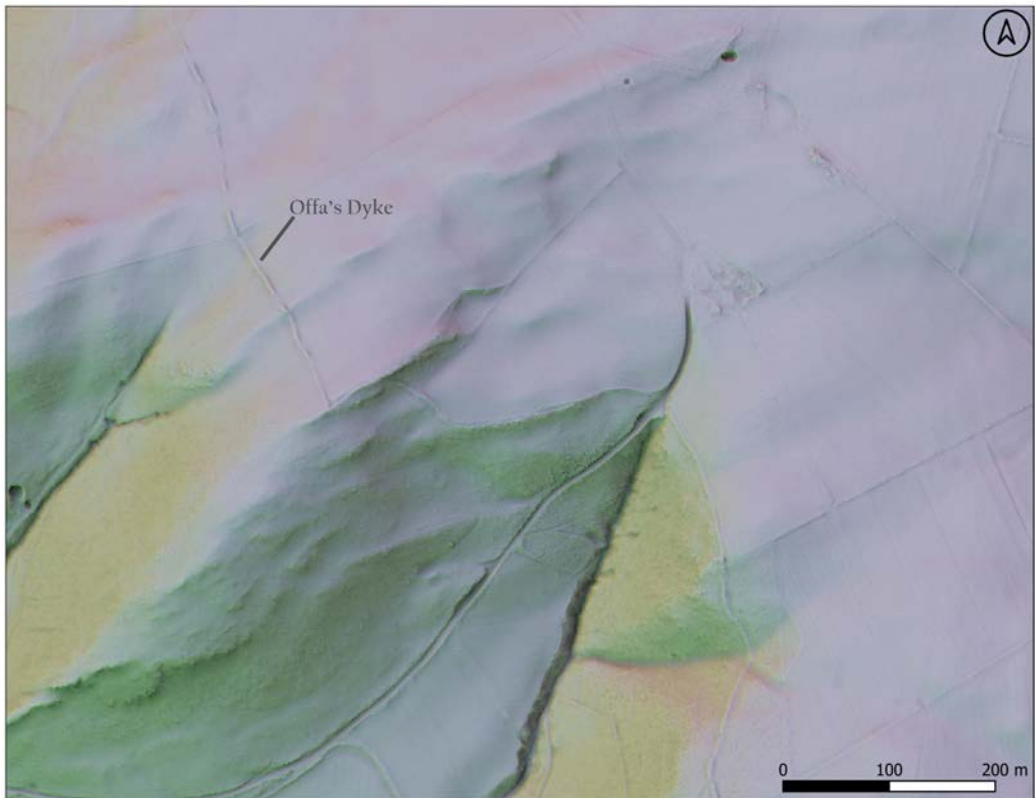


Figure 4: Section of Dyke crossing Cwm-Sanaham at showing the combined visualization of Anisotropic sky-view factor, positive openness, slope and PCA, designed to enhance the legibility and features of the Dyke.

Dyke's visual appearance in the data which assisted with identification and recording (Figure 4). This combined visualisation was used primarily throughout the mapping survey:

- Anisotropic sky-view factor (0.65–1.0, 50% opacity, multiply);
- positive openness (70–93, 50% opacity, overlay);
- slope (0–45°, 35% opacity, luminosity);
- Principal component analysis (PCA) as a base layer.

The resulting shape created a polyline which was designed to record route and existence of the Dyke.

Whilst undertaking the survey, several different dimensions were recorded, notably the monument's form (how the Dyke presents in the landscape) and type (the surviving components of the Dyke). This paper will concentrate on form, this classification was based upon continuousness, survivability, and surface expression in order to categorise the existence of the earthwork:

- Extant: Offa's Dyke can be seen in a continuous and above-ground form;
- Indistinct: it has limited positive expression, surviving mainly below-ground or through its ditch only;
- Damaged: it cannot be seen as a continuous above-ground or below-ground form, but fragments or remnants can be mapped;
- Destroyed: no remnants of the Dyke but clear indication it was removed in a later period (such as a modern construction);
- Conjectured: Lidar data has been inconclusive and there is neither clear evidence of the Dyke existing nor any clear indication of post-construction demolition. It is possible that these areas represent true gaps in the route.

An important aspect to this mapping was utilising 3D modelling to view the landscape relief in an environment from any perspective. This allowed the lighting to be controlled in real-time, allowed full control of both observation and visualisation of the landscape, and allowed a control and tangibility to the mapping which is simply not available in 2D GIS programs. This functionality brought to light aspects of the feature which would have been missed in standard 2D mapping. It really demonstrates the often-overlooked functionality of using 3D mapping for identification and mapping. To visualise the lidar data in 3D, planlaufTERRAIN was used (Meidlinger 2021)

The following results of the survey will be presented from north to south: from the North of Herefordshire south towards the River Wye. The most comprehensive data that exists is from the Offa's Dyke Conservation Management Plan (ODCMP) and Historic England's designation data, and these have been used to project the current recorded existing lengths of Offa's Dyke to provide a consistency in data standards (Figure 1). Additionally, within the text where roman numbers are presented, they refer to annotation on the figures to aid navigation and identification.

Results

North Herefordshire (Figure 5)

Utilising the same methodology DTM survey was undertaken in the area between Rushock Hill, through the Eywood estate and the River Arrow Valley to Lyonshall (covering around 7.7km²). The ODCMP in this area consists of only two small extant segments (measuring approx. 420m combined). The smaller lies just north of Berry's Wood (SO 32393 58708). Meanwhile, the larger stretch is situated on the southern banks of the River Arrow where it was later cut by the 1857 construction of the Leominster and Kington Railway (SO 32473 258028).

In the Eywood Estate, immediately after the designated segment along Rushock Hill, an extant but almost indistinct linear earthwork is visible in the data extending north-east

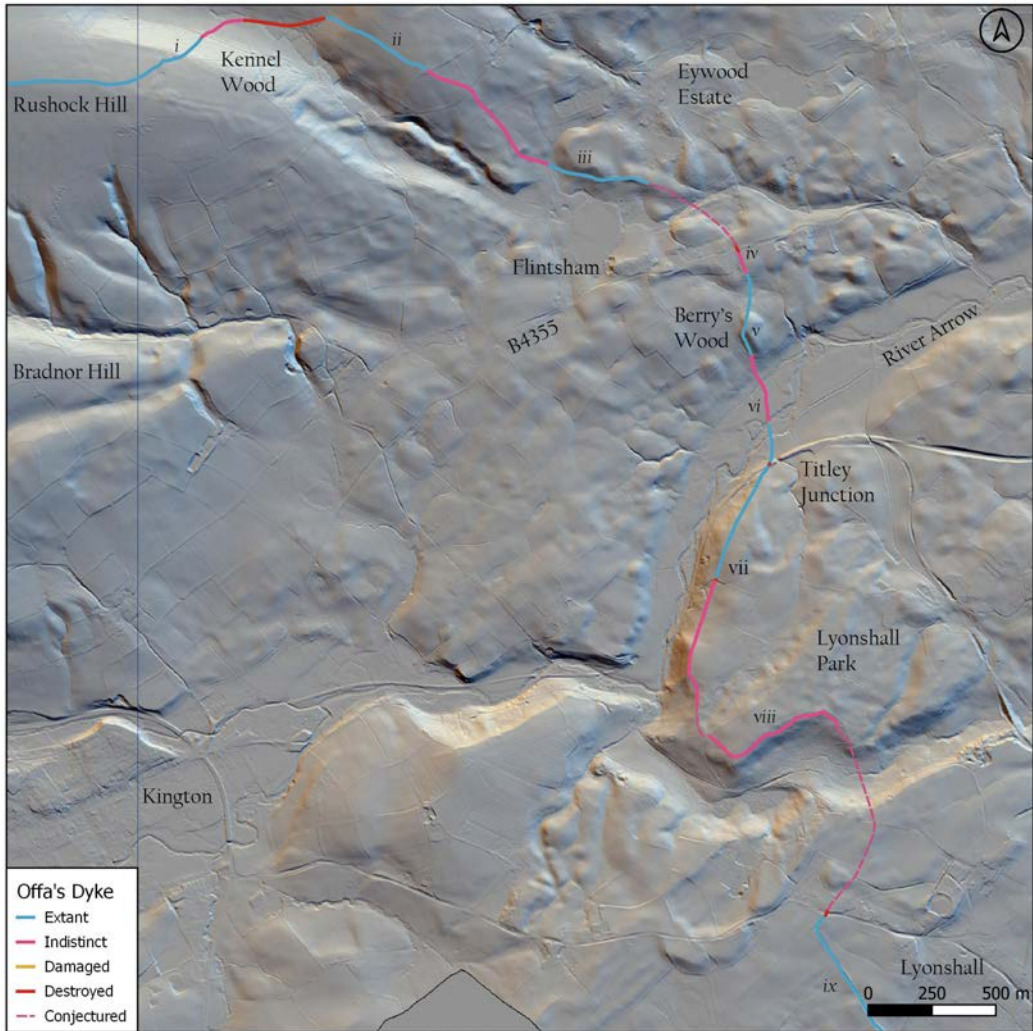


Figure 5: Map of Offa's Dyke traversing North Herefordshire and the Arrow Valley. After lidar survey there are only a few areas where a continuous earthwork cannot be traced suggesting this area was not just a series of smaller disjointed lengths. (Base Map: Multi-Hillshade)

through Kennel Wood (SO 30327 59752) beyond where it was identified by previous investigations, before quickly being lost in the landscape scattered with post-medieval ponds (i).

On the opposite side to the ponds is an unusually deep bank and ditch, slightly sinuous and traversing upslope and across higher ground along the west-facing slope to the west of Eywood Estate (ii). This earthwork, respected by post-medieval field boundaries, continues heading south-east before its physical expression in the landscape fades (SO 31147 59570). Still, the feature does continue indistinctly until the south-west slope of a rise in the landscape between Cave Wood and Garden Wood where it is preserved

by a historic trackway (iii) (SO 31798 59145). Further south, it skirts the ridge of this plateau before turning south and disappearing within the post-medieval landscaped Eywood Estate (SO 32083 59099). It then emerges again just north of the B4355, north of the River Arrow Valley (iv) (SO 32341 58887).

South of the B4355, the lidar data reveals a more continuous monument towards the River Arrow, an indistinct bank and ditch linear can be traced, surviving mainly as a subsurface feature through to join the extant segment north of Berry's Wood (SO 32393 58708). The Dyke then traverses Berry's Wood hill in a manner echoed along the whole route of Offa's Dyke (v); scaling the western slope of the hill's ridge, skirting the top of the hilltop before descending on the southern banks in what appears to be a more scarp-like form (Ray and Bapty 2016: 145–146). At the southern edge of the wood the Dyke can be seen as an indistinct linear feature crossing the floodplain of the River Arrow (vi) with only a slight surface expression, possibly a product of silt deposition from centuries of seasonal flooding. This feature continues to the north banks of the Arrow directly opposite the extant segment located there (SO 32461 58309), strongly suggesting this is indeed the continuation of Offa's Dyke.

South of the River Arrow, the Dyke ascends the valley slope, cut by the railway line, and continues along the ridge of the plateau-like high-ground atop the river cliffs. The DTM shows this linear feature continuing all the way along these clifftops, albeit in a much more damaged form (vii), akin to many similar lengths of Offa's Dyke recorded at Wyegate Hill, and Tutshill to Lancut, both in Gloucestershire above the River Wye (Fox 1955: 188–194). Other parallels include how the Dyke navigates Oswestry Old Racecourse south to Trefonen, Shropshire above the River Morda (Fox 1955: 60–61). This linear feature is recorded on the Herefordshire Historic Environment Record (HER) as a medieval wood bank or the medieval deer park pale (Herefordshire HER 1166). However, the continuous nature of the feature from the extant segment infers that originally it was same linear monument, perhaps later reused as a park pale. At the end of this clifftop, the earthwork turns east into the landscaped post-medieval Lyonshall Park, where it continues to skirt across a hilltop ridge (viii), eventually becoming untraceable. This regular behaviour is seen on many western facing hilltops throughout the route, such as Rushock Hill, Herefordshire (Fox 1955: 148–149), and Llynlyn Quarry (Fox 1955: 65–66). On the opposite side of Lyonshall there is then the longest extant segment of the Dyke in Herefordshire (1.6km) which continues towards Holme Marsh (ix).

Together, these new lengths of Offa's Dyke completely change the idea of north Herefordshire being an area of small, disjointed lengths of linear earthwork: it is an area where the Dyke can be now shown to have been as continuous as elsewhere. This explicitly counters the argument by Hill and Worthington (2003: 129–133) who were emphatic the monument did not extend south of Rushock Hill.

Herefordshire Plain (Figure 6)

Despite numerous surveys there has never been any proven segments of the Dyke recorded through the Herefordshire Plain. Yet, equally, there has been no satisfactory reason for the Dyke not to be constructed here. Cyril Fox proposed that this was due to thick primordial woodlands that prevented the construction of the Dyke and acted as a barrier itself (Fox 1955: 206–208). Noble surmised there was a wooden palisade constructed (Noble 1998: 25–28), whereas others have suggested that there simply was no construction through the low lying plain (Hill and Worthington 2003: 129–133). Ray and Bapty questioned the idea that the segments in Herefordshire were discrete and unrelated short dykes and indicated places where their orientation and placement was not plausible as cross-valley and cross-ridge dykes (Ray and Bapty 2016: 48–50); they argued that this region required a more detailed survey, which this article now can provide.

Through the Herefordshire Plain there is a gap of around 9.5km between the next recorded (and designated) segments of Offa's Dyke, which are between Holme Marsh in the north-west and at Clayfields in the south-east, encompassing the villages of Woonton and Sarnesfield. This landscape is ideal for agriculture, a stark contrast to the higher ground which dominates the more northern stretches of Offa's Dyke or its use of steep valley slopes along the Wye in Gloucestershire. The Herefordshire Plain was subject to later extensive agriculture, the heavy loam soils providing the perfect environment for the establishment and growth of substantial farmsteads from the fifteenth century, in association with the piecemeal enclosure and reorganisation of the fields, leading to production from intensive land use (Lake and Edwards 2006: 36; Lake and Edwards 2020: 2–3). These factors together mean the Dyke was likely modified or ploughed, essentially removing much of its physical appearance and former line.

An additional modern factor hindering interpretation for this area is that the main data source that has been used to undertake this project (Environment Agency Lidar data) is currently completely absent for a large part of the central part of the Herefordshire Plain. Although these results should be considered of a lower certainty, as these interim observations in this section of Herefordshire have been done from observations based on a mix of lidar data and aerial photography and will be updated when the lidar data is available.

The development of Holme Marsh has obscured any trace of the Dyke going through the village. It enters at the north-west side, from the designated segment (i) (SO 33665 54805), then at the south-eastern end of the village a very faint linear continuing on a similar alignment can be traced heading south-east. The modern road breaks this line, but it continues as a much larger, more distinct linear, utilised as a substantial field boundary with a bank to the north-east and a south-west facing ditch (ii) (SO 34247 54326). Indistinguishable from other lengths of the Dyke elsewhere, this linear extends for around 415m before its surface expression fades out of the data.

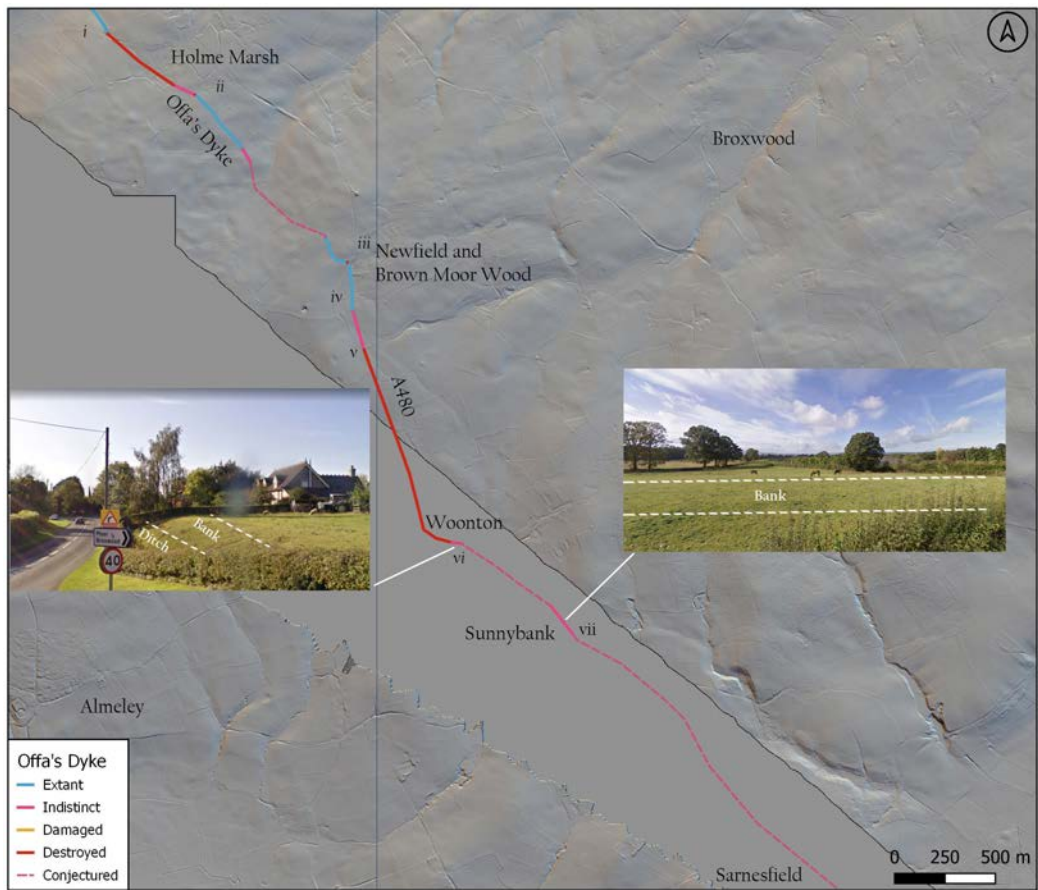


Figure 6: Map of Offa's Dyke through the Herefordshire Plain. A large part of the Plain is still not covered by accessible lidar, but Google Map images have helped identify possible lengths of the Dyke either side of the road and north of the Plain has revealed evidence for the Dyke. (Base map Multi-Hillshade)

Nearby, an earthwork bank and ditch can be seen skirting and cutting through the end of Newfield and Brown Moor Wood (iii). This earthwork is identified as a large wood bank and was highlighted by Ray and Bapty as a possible component of Offa's Dyke (Ray and Bapty 2016: 288), and as it traces the edge of the wood it makes a sharp turn east, followed by a right-angled turn south exiting the wood (iv) (SO 34796 53678). Then, in the DTM, this bank can be seen heading south becoming increasingly degraded, first through an orchard before it meets the A480 and is no longer visible in the data (v) (SO 34939 53234).

These remote observations do strongly suggest there is the possibility that the majority of Offa's Dyke now lies beneath the A480, from Brown Moor Wood (SO 34870 53622), through Woonton (SO 35299 52299) and Sarnesfield (SO 37009 50787) continuing a north-west to south-east trajectory to around Moorhouse Coppice (SO 37585 50311). It is

not unusual for Offa's Dyke to be subsumed by later features; elsewhere the Dyke's route has been supplanted by modern roads, such as the B5101 north and south of Llanfynydd in Flintshire (Fox 1955: 33). Where this has happened, relict earthwork evidence can be seen alongside the modern road, surviving in places where the road did not completely supplant the earthwork. This survival has been proven through excavation (Hill 2020).

If one continues this tentative theory, then either side of the A480 there would be evidence of Offa's Dyke. Therefore, using aerial photography, Infra-Red Photography and Google StreetView, a rapid survey was undertaken as there is currently no lidar data. In Woonton, a large linear earthwork bank facing south-west crosses a small area of green open space and is perpendicular to the northern side of the road (vi). This earthwork is clearly demarcated on the first edition OS (SO 35399 52277), and even though it is only a short segment it is a perfect candidate for a remnant of Offa's Dyke.

Furthermore, 500m to the south of this linear feature, at Ferny Common the A480 road takes a small chicane. This reveals a west facing earthwork bank ignoring this chicane and crossing through a field to the south and then connecting to the road again (vii) (SO 35918 51893). Notably, the linear crosses in front of an eighteenth-century house that has been named 'Sunnybank', presumably after the linear bank. This suggests a well-recognised and long-lived feature in the landscape, one explanation for which is the former presence of Offa's Dyke.

These are only small glimpses of possible surviving earthworks that provide an indication that the Dyke may have continued through the Herefordshire Plain. Together, lidar allow us to infer a hint of an original continuation of the feature which has not been possible before.

Yazor Wood, Burton Hill/Ladylift Clump (Figure 7)

The Herefordshire Plain ends around 2km south-east of Sarnesfield where lidar data is again available, and the topography starkly changes. Again, there are smaller areas of higher ground. After the long stretches of lowland these would presumably have been a target for the surveyors of Offa's Dyke in order to tactically utilise the high ground as at other stretches of the Dyke (Ray and Bapty 2016: 154–156). This area, known as Burton Hill and Ladylift Clump, is now densely covered by Yazor Wood. There has been no record of the Dyke neither on nor north-west of the hill, although there are known extant segments of Offa's Dyke running directly south of Burton Hill from Claypits to the Yazor Brook, then beyond to Garnon's Hill (Fox 1955: 179–180). The fact that there has been no confirmed trace of Offa's Dyke on Burton Hill (Fox 1955: 179; Ray and Bapty 2016: 74) can be reasonably explained: the hilltop has been subject to extensive post-medieval quarrying, tree planting and landscaping (particularly carriageways) which has no doubt had a large effect on the survival and visibility of any earthwork (Hoverd 2004: 8).

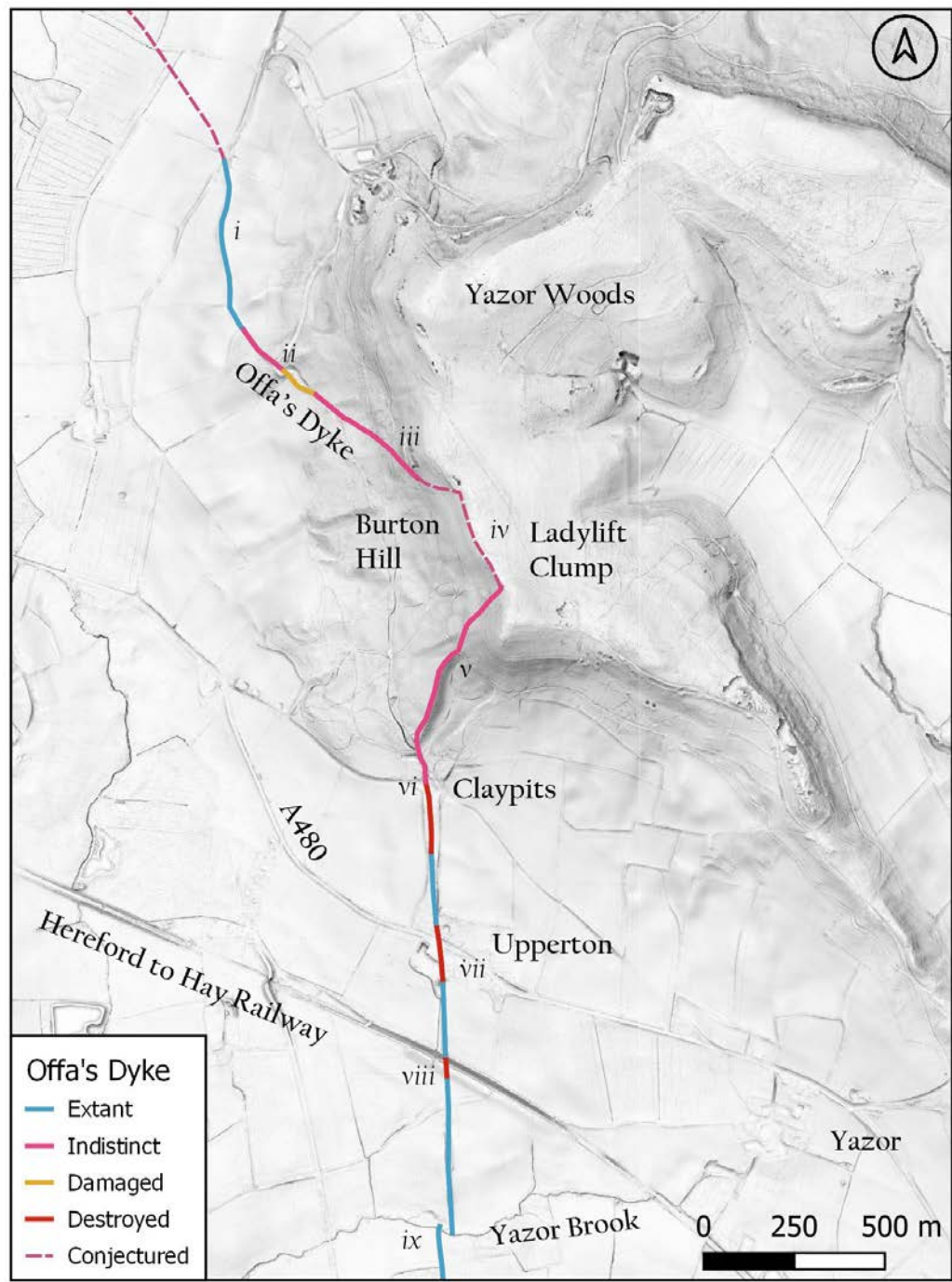


Figure 7: Map of Offa's Dyke through Burton Hill/Yazor Woods. An earthwork at the north end of Burton Hill possibly represents Offa's Dyke, but as it ascends Burton Hill the route of it becomes more confused. It is possible that in places it has been preserved by footpaths but the pattern on lidar data is not very clear as it heads towards Claypits. (Base map SVF-A)

There is no verifiable trace of the earthwork exiting the Herefordshire Plain, nevertheless, lidar survey has revealed an earthwork on the north-west side of Burton Hill which runs from the B4230 in the north-west to the base of Burton Hill in the south-east, around 480m in length (i) (SO 38861 48883). This earthwork is slightly sinuously, west facing with a ditch on the western side; it has not been preserved as a field boundary in the field systems but has survived as a large lynchet. Given its position, size and form it is likely this is Offa's Dyke emerging from the Herefordshire Plain to cross Burton Hill, with the sinuous form presumably a product of the adjusted segmented build practice preserved in the landscape (Ray and Bapty 2016: 203–208).

When it reaches Burton Hill, this linear earthwork has become a trackway and ascends the western slopes of the hill (ii), this characteristic occurrence is oft repeated across the entire length of Offa's Dyke (Ray and Bapty 2016: 154–156). It is structurally logical as the solid bank provides an ideal pathway above muddy areas of land. This trackway can be followed for a duration of 740m as it ascends Burton Hill before it presumably crests the ridge of the hill (iii). The route is unclear on lidar, however along the ridge of the hill there is a recorded 'bank and ditch' on the Herefordshire HER (Herefordshire HER 32190) which possibly could be the remains of the Dyke (iv). Again, the exact route back down the slopes of Burton Hill to Claypits is masked on lidar by a network of inter-crossing trackways (v); it may not be until further work has taken place that the route can be confidently established.

After Burton Hill the Dyke continues down towards Yazor Brook, surviving on the lidar as a low field bank. The earthwork is preserved quite differently north and south of Yazor Brook. North of the Yazor Brook it is obscured by the modern development of Claypits (vi) (SO 39434 47149), Upperton Farm (vii) (SO 39463 46777), and the former Hereford, Hay and Brecon Railway (viii) (SO 39477 46427). These have together caused significant damage and destruction to the earthwork, creating three surviving individual designated segments. In contrast, south of Yazor Brook, the low-lying earthwork is much more continuous surviving preserved in field boundaries (ix) (SO 39500 45560) as it heads further south to Garnon's Hill.

Garnon's Hill (Figure 8)

Garnon's Hill is an area of dense forest, thick vegetation cover, and extensive Victorian quarrying which together have obscured previous observation of any presence of the Dyke in this area. Previous excavations by the Offa's Dyke Project undertaken in this area were situated according to unreliable and simplistic mapped data of the Dyke, leading to the incorrect conclusion that it was not present (Hill and Worthington 2003: 137–139). The employment of a Digital Terrain Model (DTM) contradicts their preliminary determination, revealing a degraded linear feature that extends from the extant segment north of the River Wye.

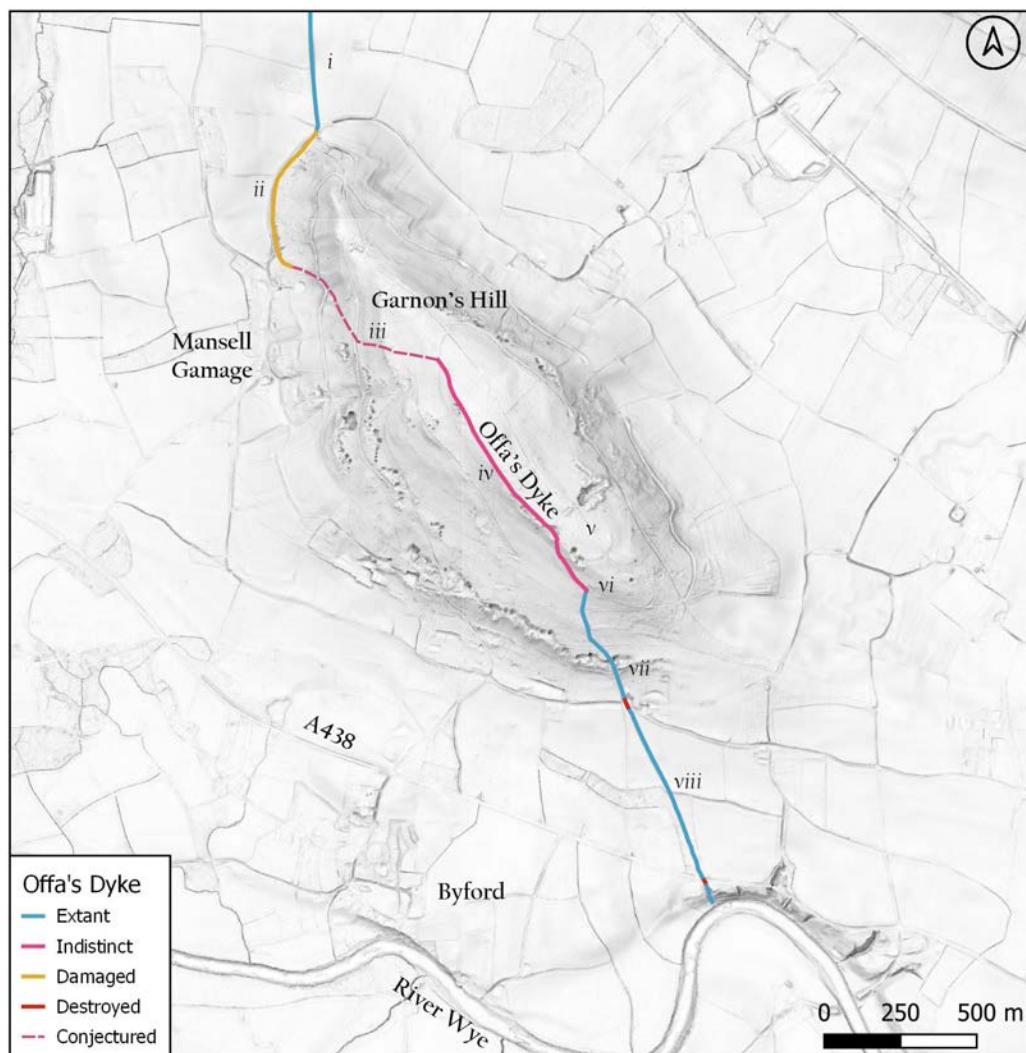


Figure 8: Offa's Dyke recorded navigating Garnon's Hill, Herefordshire. The clear earthwork trace disappears to the north of the hill but has in places no doubt been preserved by footpaths, although post-medieval forestry activities make it hard to be confident. (Base Map: SVF-A)

After the plain south of Yazor Brook where it is preserved in field boundaries (i), the Dyke seems to utilise the lower slopes of Garnon's Hill where it survives in a very damaged form, possibly utilised as a wood bank at some point but forming the edge of a trackway (ii) (SO 39736 44582). The exact route by which Offa's Dyke ascends the north-western slopes of Garnon's Hill is almost untraceable on lidar data (iii). It is possible that in places it has been incorporated into footpaths and trackways which cross the slope: the packed stone and earth of the bank would make an obvious route to place a footpath, echoing placement in Eywood. This, coupled with the thick forestry, easily conceal Offa's Dyke's former line.

Eventually, however, Offa's Dyke can be picked up as a very low earthwork, almost indistinct in the landscape, having been badly degraded by erosion, forestry operations and post-medieval quarrying. Nevertheless, it can be traced skirting just below the ridge of the hilltop before it descends on the south-western slope (iv) at a possible prehistoric hilltop enclosure (v). It notably descends in distinct stepped turns, before taking a right-angled turn (vi) as it goes directly down the southern slope to the base of the hill (Williams and Delaney 2019: 9–10, Figure 7) where there is an extant segment of monumental scale (vii). In other words, counter to the expectation of the Offa's Dyke Project, but matching with the Dyke's behaviour elsewhere (this can be seen on Hergan Hill, Shropshire (Fox 1955: 130–132), Panponton Hill and Llanfair Hill, Flintshire (Fox 1955: 137–140), and Llanymynech Hill, Shropshire (Fox 1955: 65–67)), the monument incorporates the western break of slope of the hill rather than its summit.

After Garnon's Hill there is an extant designed segment of Offa's Dyke that continues to the north banks of the River Wye (viii). This incredibly straight stretch of earthwork has been related to Rowe Ditch, Staunton-on-Arrow (Hill and Worthington 2003: 143) as a lone cross-valley dyke, designed to block the east–west Roman Road (Kenchester (Magnis) to Brecon (Brecon Gaer)) – if that road even existed (Noble 1983: 24). However, these newly identified lengths have redrawn the map in this area. With the confirmation that the Dyke navigates over Garnon's Hill, unlike Rowe Ditch, there is no northern terminus to this stretch. The verification of an almost continuous earthwork connecting the north of the Wye with the designated segments either side of Yazor Brook, north of Garnon's Hill transforms our appreciation of Offa's Dyke between the Severn and the Wye.

South Herefordshire Gap (Figure 9)

After Offa's Dyke reaches the north banks of the River Wye, there is no recorded presence of the Dyke until north Gloucestershire near Lower Lydbrook, some 32km south (Ray 2021). This is by far the largest gap in the route of the Dyke, and so far, any attempt to record extant segments have been unsuccessful. Within this DTM survey there has been no satisfactory segments discovered that could fit with the behaviour of Offa's Dyke elsewhere. There have been a number that have been seen as possible candidates which include the Perrystone Dyke, Upton Bishop (SO 62842 29493), the Linton Ridge, Ross-on-Wye (SO 66864 24173), Fownhope Park Dyke, Fownhope (SO 57603 35963), and Frith Wood Dyke, Ledbury (SO 71791 39391). However, they all seem unlikely to be part of the 'Offan' scheme in part due to a number of characteristics that make no sense in regard to Offa's Dyke, including their location, orientation, and isolation (lack of any clear continuous trajectory) in the landscape. Instead, they are more likely to be unassociated cross-valley dykes and a ridge dyke for which the region has many (Grigg 2018:167–168). It seems very likely that this gap is genuine and opens the possibility that the Mercian's adopted alternative solutions to managing their frontier in this region: the frontier work is replaced by the River Wye itself, as seems to have been the case for the

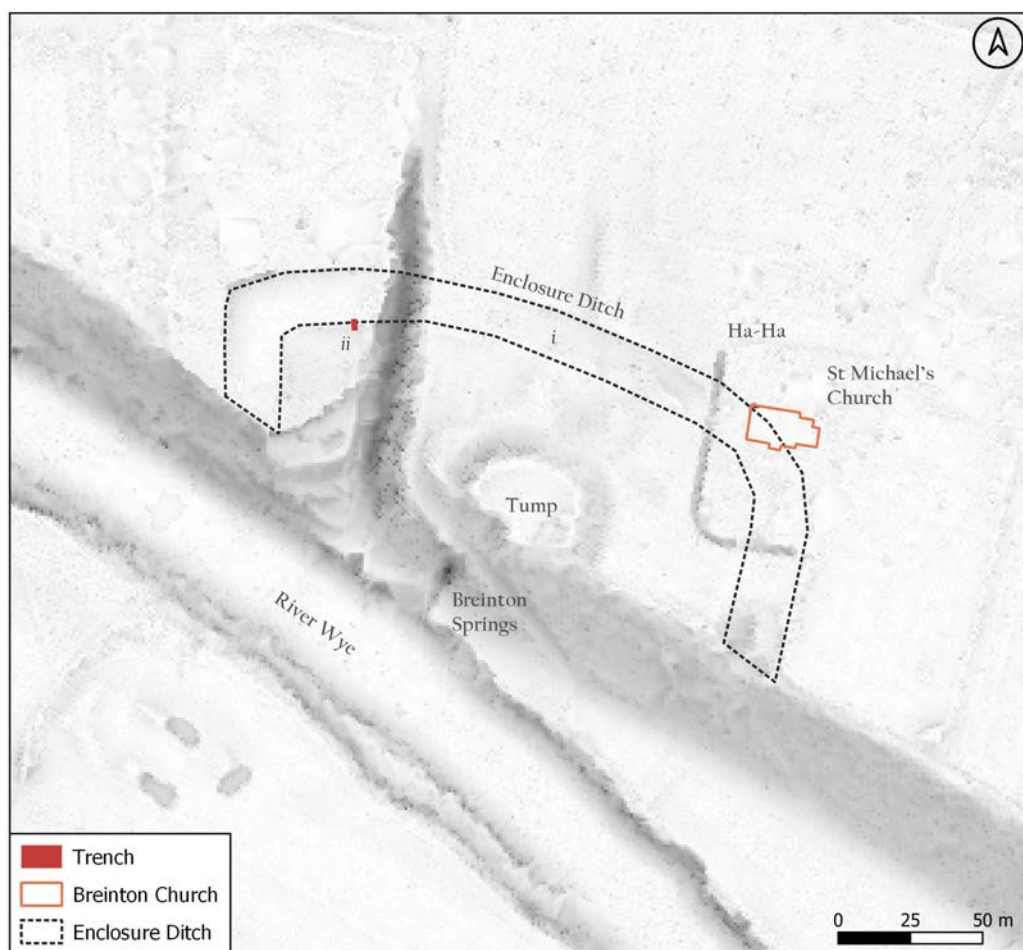


Figure 9: At Breinton Springs, Herefordshire a large enclosure ditch, below the Norman Church that encircles a smaller tump on the north banks of the River Wye. (Base map Multi-Hillshade)

River Severn and (for a far shorter stretch) the River Dee to the north (Ray and Bapty 2016: 288–289).

Through lidar survey discovery of a feature in Brienton, around 7km east of Garnon's Hill, seems to offer a possible suggestion for this expansive absence (Ray 2021). A central tump that is encircled by wide bank and ditch defences is suggestive of a type of fort (i) (Figure 9). Through the discovery of early medieval pottery and corn drying ovens during excavation of this site (ii), it has been dated to the early medieval period. Although these results are only preliminary and more excavation is required, this feature inspires close comparisons to both the Saxon defences of Hereford and the temporary fort at Repton (often attributed to the Viking Great Army (Jarman *et al.* 2018)). Preliminary results are suggestive of an early medieval defensive site located on the north bank of the Wye between Offa's Dyke and Hereford (Ray and Delaney 2018: 153–174).

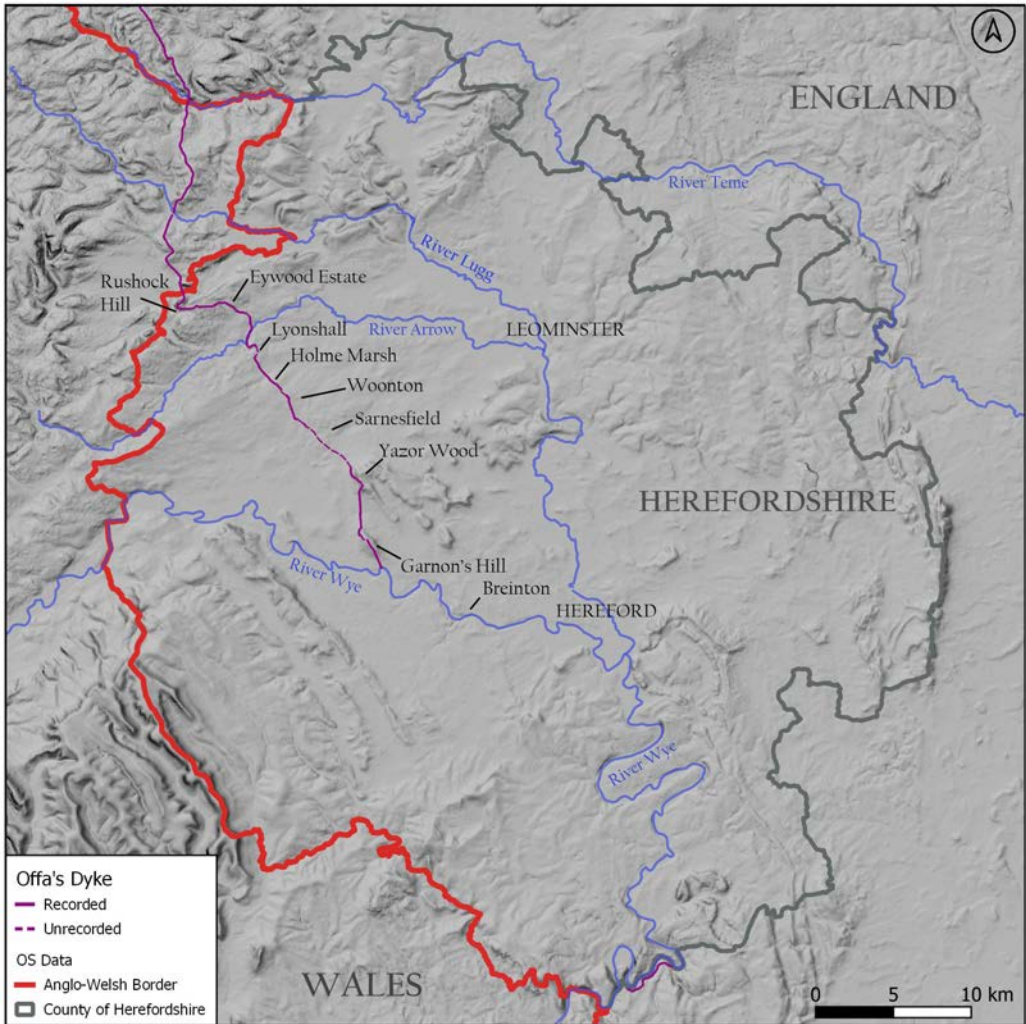


Figure 10: Plan of Offa's Dyke in Herefordshire after the lidar survey, a significant amount of recorded Dyke has been added to the map which adjusts the route and placement through Herefordshire. The Dyke is now looking much more likely to have crossed through Herefordshire.

It does seem confusing that there would be a part of the frontier without Offa's Dyke running along it, and this discovery is possibly unique evidence of a different sort of frontier than we have along the rest of the Anglo-Welsh borderlands. Presumably there never was a Dyke in southern Herefordshire and instead Mercia facilitated a different frontier solution. In effect, the River Wye *became* Offa's Dyke, and instead of the impassable earthwork shadowing the banks of the river the Mercian's created a managed fortified crossing point (or points) to funnel and control passage and trade. If this feature can be proven to be a fort, then it is possible that it highlights something which has only been theoretical (Ray and Bapty 2016: 288–289), that complexity is present in the relationship between Mercia and Ergyng which is different to the relationships of the other Welsh border kingdoms.

Discussion

If all these newly discovered earthwork segments, together with the remapped segments, represent Offa's Dyke in Herefordshire it provides an opportunity to confidently re-investigate what Herefordshire represents to the Mercian frontier (Figure 10). The differing levels of survival between segments of the Dyke are consistent with the fluctuating preservation found upon different sections of other early medieval earthwork monuments (Grigg 2018: 144–149). The impact of post-construction processes means where some earthworks are well preserved in the landscape (e.g., Fastaen Dic, Kent (White 2020: 81–103)), others are severely damaged from their original extent (e.g. Grim's Ditch (Harrow), London (Ellis 1982)) whilst some have nearly vanished entirely (e.g., Grims Ditch, Aberford, West Yorkshire (Weldrake 2011)). Understanding these differences in landscape activity brings into the question theories based on suppositions regarding the original constructed form of the Dyke versus modern survival appearance (Fox 1955: 81, Ray and Bapty 2016: 165–167). These contrasting modes of survival for earthworks, coupled with the practical hindrance of terrestrial survey, has caused some ambiguity over the existence of Offa's Dyke in some areas. However, the methodology adopted here has been able to demonstrate there is a use for digital mapping in assisting in identification and survey.

Lidar has given us the ability to trace an almost continuous linear earthwork from Rushock Hill to the south-east of Holme Marsh. Additionally, there are possible extant segments of the Dyke now recognised through the Herefordshire Plain, and then a near-continuous linear earthwork down to the River Wye. What looked like lone segments of Dyke (Figure 1) can be demonstrated to be part of a large scheme. These discoveries potentially establish that the Dyke traversed Herefordshire as much as any other region (Figure 10).

It is completely logical that the more low-lying topography of Herefordshire would subject Offa's Dyke to more intensive and extensive damage from later activity. The soil rich lowlands and hilltops were ideal areas to exploit in developing intensive agricultural regimes, leading to creation and expansion of open field systems (Williamson 2003: 181), especially due to rising economic activity (Rippon 2010: 41). It has been suggested that Offa's Dyke was possibly abandoned only decades after it was constructed (Ray and Bapty 2016: 355) associated with a relatively short duration of political and military hegemony by Mercia. Yet in the context of intense economic expansion of the long eighth century (Rippon 2010: 45–51; Higham and Ryan 2015: 181) it is possible that intensive agriculture took place in this region soon after the Dyke was built. If this is correct, then within a generation of Offa's Dyke's construction, the process of removing it from the landscape could have been initiated, building in intensity as a pressure on suitable soils became more severe (Costello 2021). This would have only intensified again as agriculture became further intensified and mechanised in the post-medieval period. Such successive processes were completely different to those affecting Offa's

Dyke in more marginal upland areas to the north, where the Dyke was more commonly constructed. This is a far more convincing explanation for the stark contrasts in the monument's modern survival than contrasting original modes of construction or the monument having been incomplete, replaced by a palisade or merely absent from long stretches of the Herefordshire Plain.

Herefordshire is also known for pronounced shifts in Offa's Dyke's alignment (notably at Rushock Hill (Ray and Bapty 2016: 234–235)). The general route of the Dyke turns at this point to head more south-east; digital mapping can illuminate these localised adjustments in the route. Offa's Dyke takes a very direct route through high ground, but when crossing low-lying landscape for extended distances its route can become more circuitous, utilising shorter lengths and more varied lengths of segments to adjust the route over the landscape (Ray and Bapty 2016: 131–135). This circuitous routing also makes it harder to trace and predict, as even though it seems to target west facing higher ground, it does not seem to follow contours in the landscape. It is therefore in these changes of orientation it is possible to see conscious design decisions behind the route and placement, hinting at the possible affects which the route and placement of the Dyke was subject to. Whether it be to satisfy tactical advantages in the landscape (Ray and Bapty 2016: 234–240), to emphasise the Dyke's appearance (Ray and Bapty 2016: 131–135), or owing to the Mercian's own perceived power, or not, in certain regions along the borderland (Delaney forthcoming).

This more sinuous nature of Offa's Dyke becomes even more apparent when viewed in a 3D environment (Figure 11). North Herefordshire (Rushock Hill to Lyonshall) is a fantastic example of this sinuosity and shows that angled turns are not arbitrary: the placement of the Dyke seems targeted to utilise even minor west-facing higher ground. Even the right-angled turn at Rushock Hill, which has been subject to debate, appears to avoid a vast swathe of the River Arrow plateau. Instead, the route through Eywood means smaller slopes and hills, like Berry's Wood, are utilised to improve upon the Dyke's visual impact westwards (Ray and Bapty 2016: 151–157), which is much decreased if it travels through the very low-lying landscape.

This utilisation of visually striking topography can be demonstrated in undertaking viewshed modelling. It has often been presumed that the Dyke was used to aid surveillance, highlighting Offa's Dyke's attributes as a functional frontier monument (Delaney forthcoming).

Conclusion

This presentation of the results of research into one of the most disputed sections of Offa's Dyke, demonstrates how this method of survey is of great assistance in revealing and mapping linear earthworks not possible via traditional terrestrial survey alone. The article suggests that Offa's Dyke in Herefordshire is not an area of disassociated short

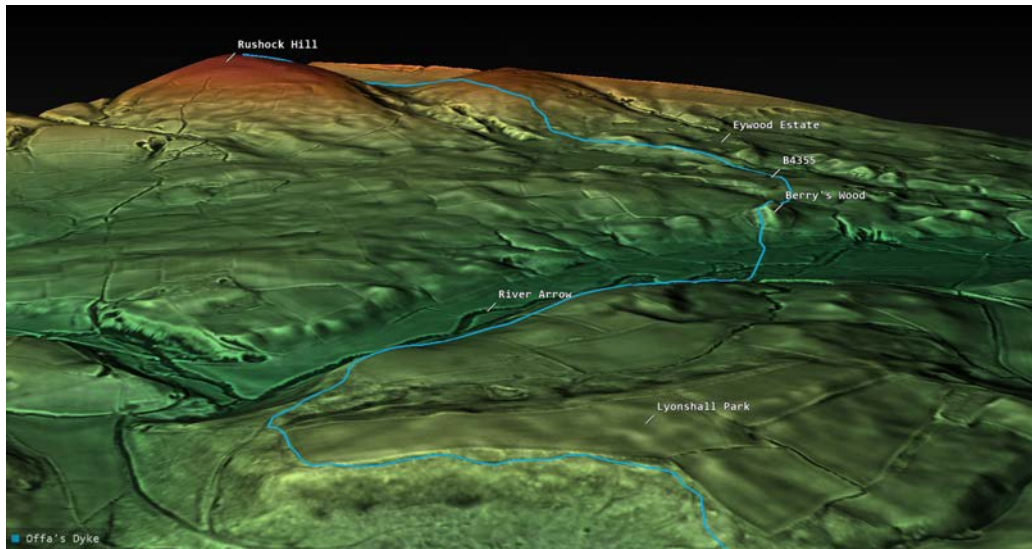


Figure 11: Viewing this region in 3D relief Offa's Dyke's use of the landscape is very clear, it clings on the west facing slopes of even relatively small hill slopes, improving its visible impact westwards.

dykes, but that the local topography has directly impacted the presentation and course of Offa's Dyke. Offa's Dyke passes through the county continuously, albeit subject to much more intensive post-construction activity and erosion than on the hill country of Powys and Shropshire.

This confirmation expands our understanding of Offa's Dyke, it not only allows a fuller picture of the Dyke, but it also reduces the supposition that can occur when studying the nature of the Mercian frontier. The lidar study goes some way towards confirming that Offa's Dyke is largely a continuous monument, and that breaks or gaps in the Dyke are therefore changes to that normality. The gaps in Offa's Dyke are thus important, and an indication of a choice in design, from a possible change in the function of the frontier. It has been suggested before that the Dyke's construction is a result of some unique relationship or hostilities with the kingdom of Powys urging a militarist approach to defending the landscape (Hill and Worthington 2013: 107–112, Worthington Hill and Grigg 2015: 162–166), but if the Dyke continues largely unbroken across northern Herefordshire, then the monument can be understood as built as part of a frontier landscape opposing other Welsh kingdoms including Maelienydd, Brycheninog (further west), and Gwent (further south). As discussed, in Herefordshire the largest gap is in south Herefordshire, which exposes a possible unique relationship with Eryng. Equally, gaps at rivers suggest the importance of water courses in the region. Now that we have an accurate record of the Dyke, we can start questioning reasons for placement and location.

Herefordshire is the area of greatest divergence between the modern Anglo-Welsh border and the postulated continuance of the monument and so the monument does not pervade in popular consciousness in this area; indeed, the Offa's Dyke Trail does not follow the route of the Dyke at all south of Rushock Hill (Noble 1981: 34). This separation from public awareness exacerbates other issues since conservation and management both require active participation and consideration; it is very hard to get the community to care for a monument that it cannot see or is uncertain in its location. Hence, without due recognition, it is far easier for to perpetuate and extend neglect for surviving stretches of this monument. This disconnection was securely evidenced in the recent Offa's Dyke Conservation Management Plan (ODCMP) where it was observed that Herefordshire suffers some of the worst degradation of the earthwork (Haygarth Berry Associates 2018). The generation of this new survey data can be used to improve the knowledge, and conservation of the Dyke, confirming Offa's Dyke as an important and notable part of Herefordshire's historic environment.

The study therefore has direct ramifications not only for the archaeological interpretation as well as the heritage conservation and management of Offa's Dyke in Herefordshire. Furthermore, it provides a pilot study for the fuller survey of the entire monument across every region in which it is postulated to have once existed. This has the potential to not only illuminate new insights into the course and placement of the early medieval monument where there has been debate regarding whether it ever ran, but also to provide a dataset of the entirety of the Dyke that can be queried and interrogated for research, management, and conservation purposes. If possible, this could be extended for other linear earthworks elsewhere in Britain, providing a reliable map of comparative analysis of their location, extent and the shared management and conservation issues they face in the twenty-first century.

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Offa's Dyke in the Landscape: Comparative Size and Topographical Disposition as Indicators of Function

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Despite the large volume of published work on Offa's Dyke there is no settled conclusion as to its original purpose. Many different and often conflicting theories exist, most of which can be put into three broad categories: defensive, political and economic. It is generally accepted that the monument's disposition relative to the adjacent topography is significant for interpretations of purpose. In this article, field survey and GIS mapping techniques are applied with respect to the comparative size and topographical disposition of a stretch of central Offa's Dyke in order to examine its utility as a defensive structure. This allows a re-evaluation of claims by Hill and Worthington (2003), among others, that the route of Offa's Dyke was designed to optimise outlook by following the west facing brow of hills, or more generally to 'command' the western landscape. Evidence reported here shows that central Offa's Dyke does not consistently prioritise western views. Instead, it was positioned in such a way as to often obscure westerly vistas, despite the opportunity to optimise such an outlook by relatively minor route adjustments. On the basis of the evidence reported, discussed in the context of the wider literature, it is concluded that central Offa's Dyke should be interpreted as a physical obstacle rather than a defensive fortification. After a brief consideration of alternative theories of purpose it is suggested that Offa's Dyke was most likely built with economic and political, rather than defensive, functions in mind. It is postulated that control of trade provides a plausible context for its construction.

Keywords: borders, dykes, linear earthworks, Mercia, Offa's Dyke, Powys

Introduction

Williams-Freeman (1915) observed that 'there is indeed no problem of field archaeology more difficult to solve than the interpretation of banks and ditches'. This is particularly apparent with Offa's Dyke which, due to its great length runs through many geographically diverse regions with varying levels of elevation. Running for around 60 miles, the central section of Offa's Dyke is the longest continuous earthwork in Britain. Most often associated with the late eighth-century Mercian ruler King Offa, Offa's Dyke is conjectured as positioned in the western borderlands of Mercia (Hills and Worthington 2003).

At the time of Offa's reign (AD 757–796), the inhabitants of what is now called Wales identified themselves as 'Britons', stressing their Brythonic cultural origins or, from at least the sixth century AD, the Cymry; a name which distinguished them from the more Romanised cultures to the east (Jackson 1963). By the second half of the eighth century, the Cymric peoples to the west of this part of Offa's Dyke fell under a polity commonly referred to as the Kingdom of Powys.

There is reason to believe that populations of both Cymric and Anglo-Saxon descent lived on both sides of the Dyke at the time of its construction (Ray and Baptý 2016: 226), and we can anticipate there were periods of peace and even cooperation between fluctuating kingdoms and territories. Nevertheless, considering the particularly turbulent nature of the Powys/Mercian relationship and the fact that the most continuous stretch of Offa's Dyke is positioned between these two kingdoms, this article focuses on a central stretch of the earthwork, specifically the area near Llanfair Hill (SO 25304 78775), to consider its utility.

Theories about the practical functions of the linear monument fall into three broad categories:

- defensive: to act as a military installation against incursions, ranging from smaller raiding parties to larger-scale military forces;
- political: to articulate and manage the border or frontier zone between adjacent kingdoms;
- economic: to operate as a barrier for channeling goods for the purposes of controlling monopolies or taking duties.

Among those arguing for a defensive function, Hill and Worthington (2003: 120) asserted that '... the chosen line always attempts to take a position where there is a clear view to the west, even when this means moving slightly away from the direct line'. They emphasise this point with an illustrative figure showing the dyke was placed to 'curve round the west-facing slope of a hill to keep the view into Powys'. This type of generalisation is perpetuated elsewhere in the literature. For example, Malim and Hayes (2008) cite Hill and Worthington and state: 'Offa's Dyke was carefully sited to give strategic advantage by maintaining views to the west at all times'.

In their extensive and detailed analysis, Ray and Baptý (2016: 3) sometimes postulate Offa's Dyke's positioning in terms of 'vantage points', suggesting that Hill and Worthington's determination of a defensive purpose has become '... orthodox despite being founded upon a problematic evidence base...'. They also assert that future studies should integrate modern mapping techniques such as viewshed analysis with field-based investigation in order to discern more carefully between potential alternative interpretations (Ray and Baptý 2016: 153, 401).

This article reports such an approach which Ray and Baptý advocate, with a view to critically examining aspects of Offa's Dyke's defensive utility. Empirical evidence on size and topographical disposition provides landscape perspectives which contradict generalisations such as those of Hill and Worthington (2003). This evidence is presented and then discussed with reference to literature for and against a defensive function. Alternative theories are then briefly considered, and functions more compatible with the evidence are postulated.

Method

Comparative size

Profiles of three separate Anglo-Saxon period dykes were created using a Garmin TOPCON GPSMAP survey device to record coordinates and elevations along transect lines which began and ended at least a metre beyond the point where the earthwork reached the natural elevation of the landscape. Data was collected at every noteworthy elevation change along each survey line. In addition to that part of Offa's Dyke which forms the focus of this report, East Wansdyke in Wiltshire and Devil's Dyke in Cambridgeshire were surveyed for comparative purposes as part of a more extensive study (Humphreys 2016). The coordinates for the profile locations are indicated in the Figure 1 caption.

In comparing the sizes of banks and ditches, questions of erosion, slumping and in-fill must be taken into consideration especially when considering height and depth. The extent to which original dimensions are preserved depends on the nature of the sub-soil used for its construction and the extent of post-construction human activity. Both of these features have been recognised as relatively favorable for the preservation of Offa's Dyke in the stretch under consideration. Here, in the Clun Forest of Shropshire north of Knighton, the earthwork crosses high plateau country comprised of upper Silurian shales. This landscape has historically sustained only a sparse human occupation. Offa's Dyke has consequently retained relatively good preservation in this area (Fox 1955: 125–126; Ray and Bapty 2016: 18). Nevertheless, despite these advantages, some level of erosion and in-fill will have occurred, and while the original height of the bank can only be estimated; excavation evidence invariably reveals some natural ditch in-fill in such earthworks. In this context the overall breadth of the structure, including bank and ditch, is regarded as less vulnerable to change and, for our purposes more reliable than vertical measurements as a basis of comparison of different dykes. This point is most clearly apparent in areas where Offa's Dyke is badly preserved, such as near Chirk Castle where, on the basis of excavation evidence, a monumental earthwork is revealed to have existed on what is today fairly flat terrain subject to post-medieval landscaping (Belford 2019). Dimensions of Offa's Dyke's profile (Figure 1) are provided in Table 1.

Topographic disposition

In order to investigate the topographic disposition of central Offa's Dyke, landscape transects from a relatively well preserved 2km stretch in the vicinity of Llanfair Hill, Llanfair Waterdine, Shropshire, were established wherever a 5m interval OS contour line intersected the earthwork. Each of these 14 transects provides a 1km profile either side of Offa's Dyke.

To further investigate, ArcGIS was used to create viewshed maps from points on the bank corresponding to two of the transect points (T8 and T11). In this case a data set credited on Figures 3 and 4 with 5m resolution and 1.5m offset has been applied to create

Table 1. Dimensions derived from the two survey transects across central Offa's Dyke.

	Left Transect	Right Transect	Average
Vertical distance from bank apex to lowest point of ditch (m)	3.43	3.32	3.38
Horizontal distance from bank apex to lowest point of ditch (m)	6.28	5.93	6.11
Bank height above ground level (m)	2.54	2.42	2.48
Ditch depth below ground level (m)	1.37	1.40	1.39

maps showing how much of the landscape is visible from specific locations, with visible areas shaded blue. The viewshed images add a further dimension to the transects, revealing what proportion of the surrounding landscape was visible from points along the earthwork. These techniques allow objective assessment to corroborate or refute Hill and Worthington's (2003) generalisation that the monument is always optimally positioned for a western outlook.

Additionally, viewshed maps were created at alternative adjacent points near to Offa's Dyke's actual location. These points were chosen for comparative purposes, to objectively demonstrate more strategically optimised positions which would have provided more extensive outlooks than the Dyke's actual route. The coordinates of all the points from which the viewshed maps are projected are provided in the figure captions.

Viewshed techniques have been used for various structures in Britain, both linear earthworks, such as the Antonine Wall (Hannon 2018), and non-linear monuments, such as various Roman encampments, forts and communication structures along the northern frontier (e.g. Dycka 2016; Murphy *et al.* 2018; Jones 2020). In relation to Offa's Dyke specifically, Murrieta-Flores and Williams (2017) have used viewshed analyses to examine the landscape in the vicinity of the Pillar of Eliseg, a Cymric monument thought to be related to both Offa's Dyke and Wat's Dyke (see discussion) and Delaney (2020) has reported ongoing work involving a range of digital analyses of the landscape.

Results

Comparative size

In the area of study, central Offa's Dyke consists of an earthen bank on the eastern side, and a ditch from which the bank's building material was taken on the western side. Results of the GPS surveys of three dykes are shown in Figure 1. Most noticeable is the relatively small size of central Offa's Dyke compared to the other surveyed linear earthworks attributed to the Anglo-Saxon period; East Wansdyke, and Devil's Dyke.

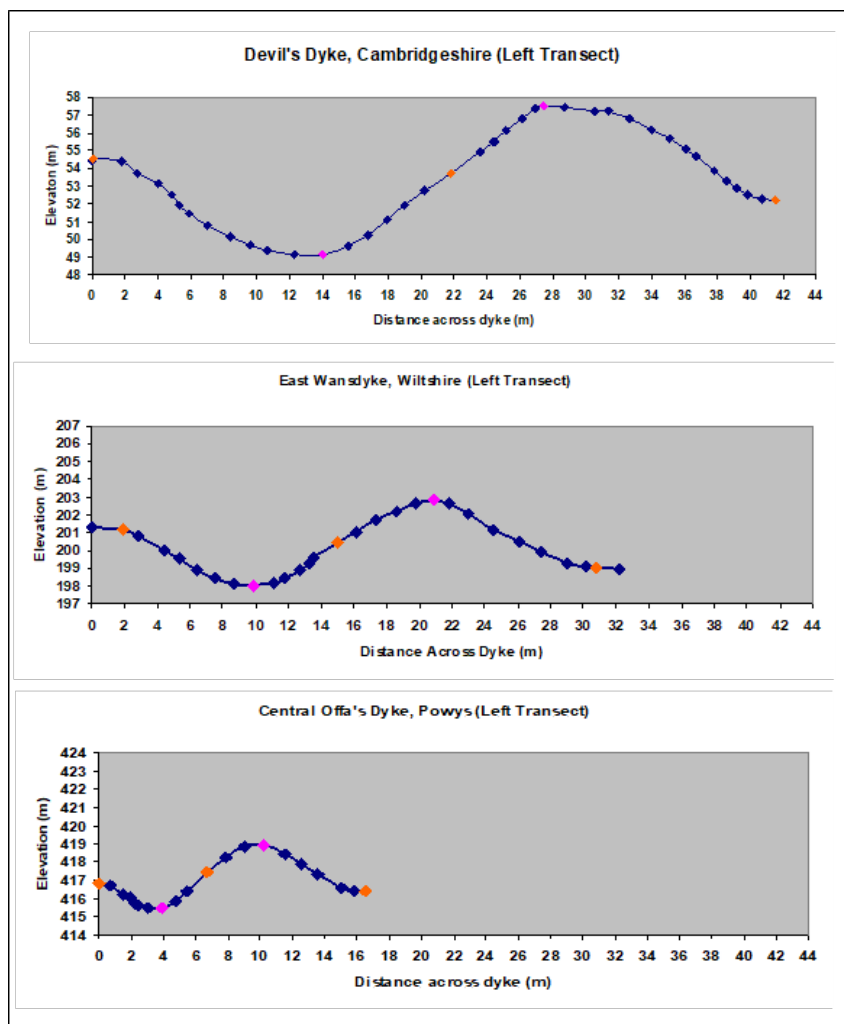


Figure 1: Same scale profiles of three Anglo-Saxon period dykes. Purple represents the points at which the bank reaches its greatest height and the ditch reaches its greatest depth. Orange represents the points at which the bank and ditch begin and end. Key statistics are shown in Table 1. (Central Offa's Dyke: SO 25304 78775; Devil's Dyke: TL 60350 60481; East Wansdyke: SU 04944 66041)

For our current purposes it is sufficient to recognise that the differences in comparative size between the three surveyed dykes are enough to indicate clearly different scales of impendence and utility. While much of the literature on Offa's Dyke emphasises the large size of the monument, the focus is normally on length. In contrast, Figure 1 shows that in section central Offa's Dyke is a comparatively small structure when considered in relation to other such linear earthworks. This must at least raise questions on its utility as a primarily defensive structure. While not in itself sufficient to reach conclusions on function, comparative size, especially when considered in relation to other evidence reported and discussed below, constitutes an arguably significant line of evidence.

Topographic disposition

Figure 2 shows the fourteen topographical transects crossing the stretch in the vicinity of Llanfair Hill. It is clear from these that the westward outlook varies considerably, sometimes offering a clear 1km view but more frequently obscured, to an extent shown on the x axes of the transects.

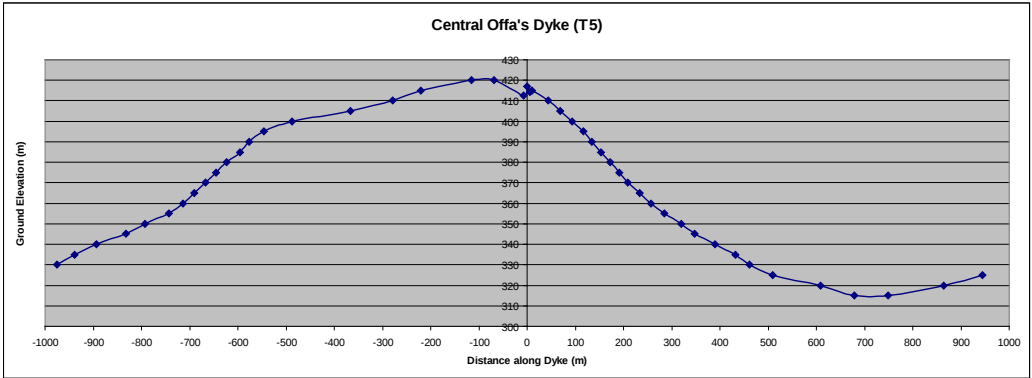
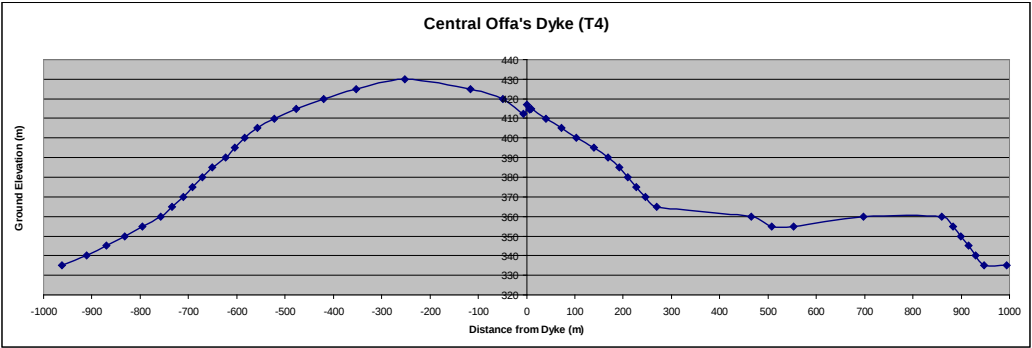
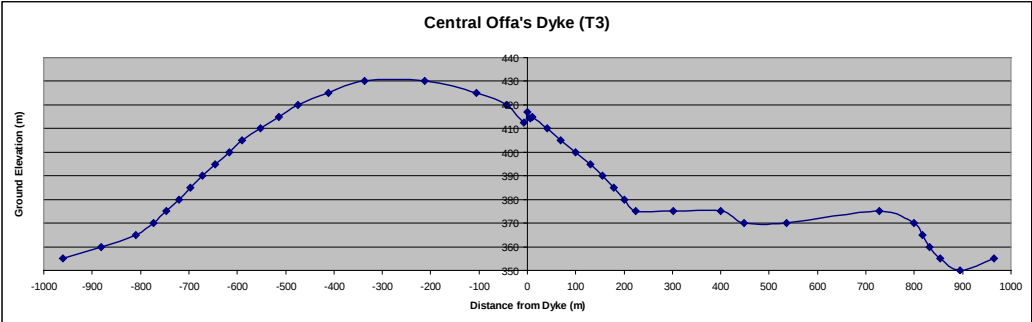
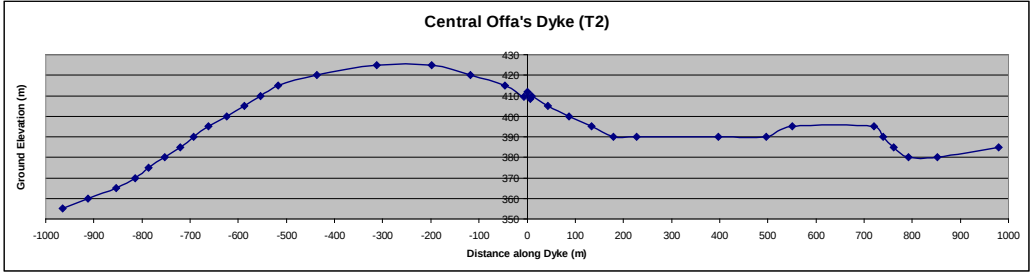
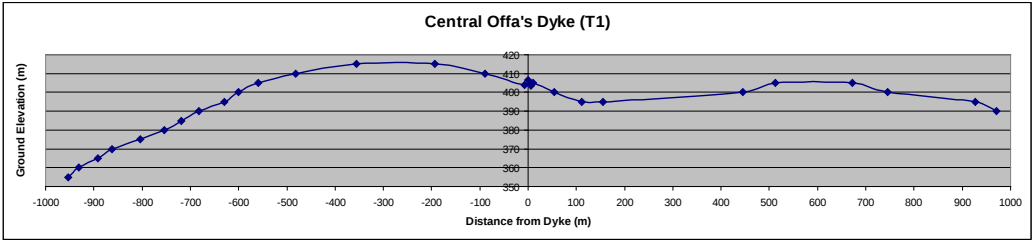
These transects illustrate the importance, in terms of outlook, of the relationship between the land profile immediately adjacent to the dyke and that further away. T5, for example, shows a position where the elevations of both the adjacent and more distant western landscapes fall away in a relatively consistent gradient (and then flatten), such as to provide a full 1km view. This represents an actual case of Hill and Worthington's (2003: 120) figurative representation of the Dyke positioned on the 'brow' of a hill, which they assert is the norm. However, collectively the transects show that this relative disposition of Offa's Dyke and the landscape was not prioritised. For example, in T6–T10 the dyke is positioned on the opposite 'brow' of the hill, giving an eastern outlook, and in T11–13 the earthwork can be described as on the top of the hill. In this latter case it should be noted that such a position, across the top of a relatively flat-topped hill, also obscures the western landscape which falls away below the line of site. The implications of these land profiles in relation to the purposes of Offa's Dyke are considered in the discussion.

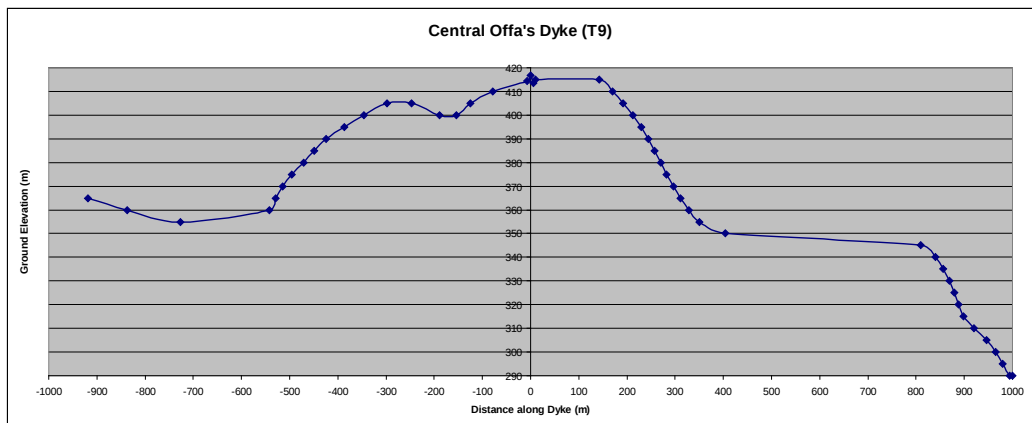
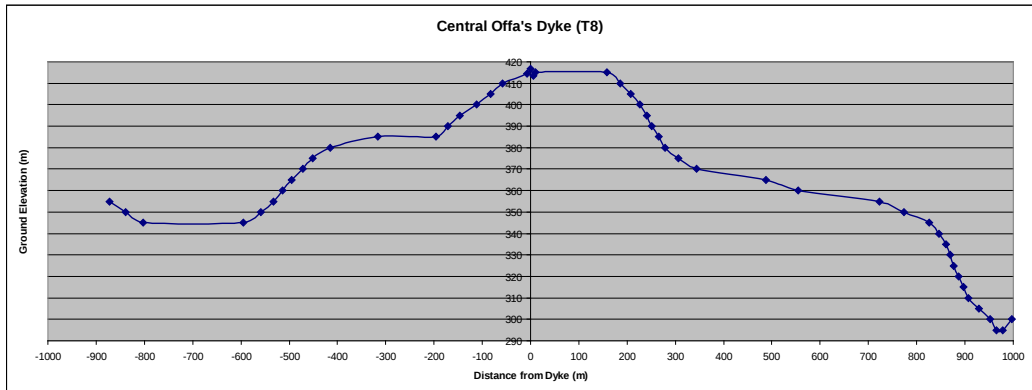
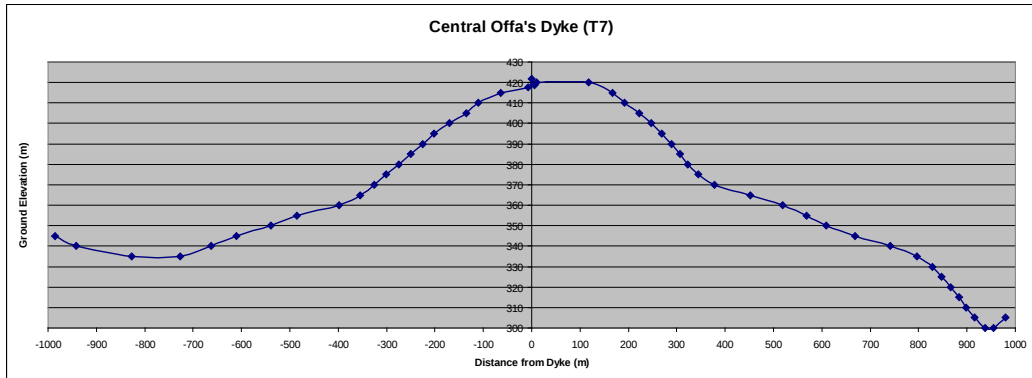
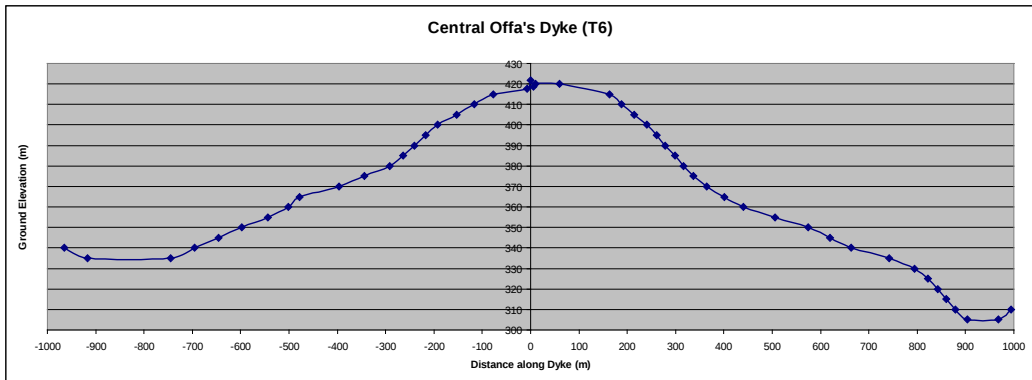
In terms of the conclusions that can be drawn from the viewshed maps, it is only necessary to note that, whereas the topography of the area makes the achievement of complete outlooks a complex challenge, the T8 (Figures 3a and b) and T11 (Figures 4a and b) viewshed maps exemplify the earthwork's sub-optimal positioning in terms of outlook, and shows that small adjustments to its route would have markedly improved the position. This evidence, combined with the Figure 2 transects, is incompatible with generalisations claiming Offa's Dyke consistently prioritised a western outlook on the western brow of hills. This is particularly stark when compared to the superior outlooks available from points along the Antonine Wall, also obtained from viewshed analysis (Jones 2020).

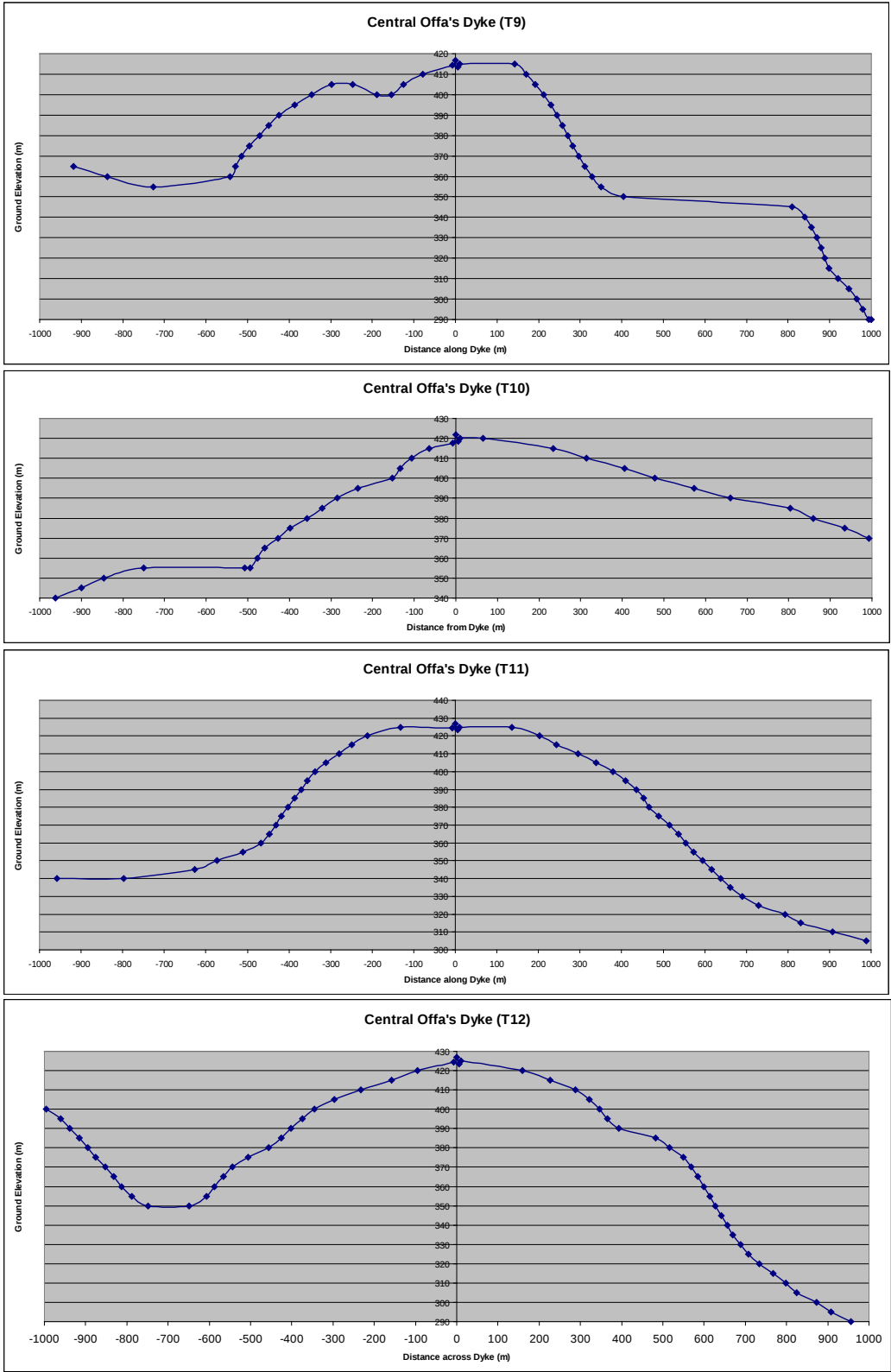
Discussion

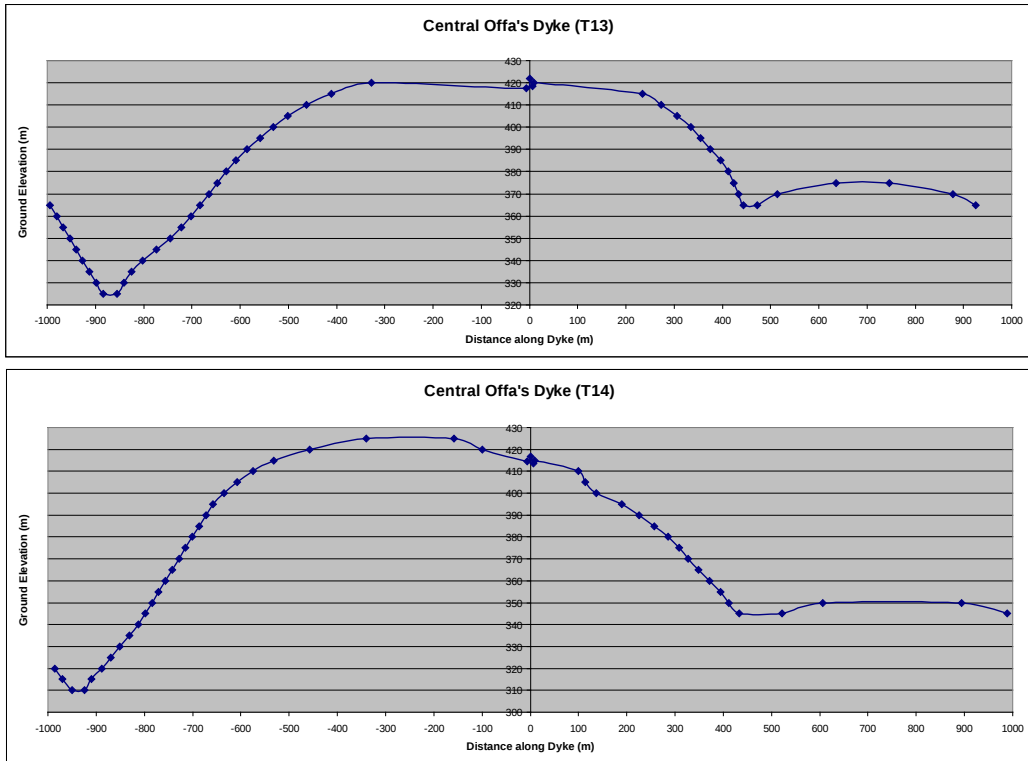
In so far as Offa's Dyke represents a rational and organised response to prevailing circumstances, its form will have a relationship to its function, and physical size in profile represents one aspect of the evidence available to inform theories of its intended purpose. In fact, for other dykes there are many references in the literature examining size

Figure 2 (opposite and following pages): Elevations on both sides of a two-kilometre stretch of central Offa's Dyke at fourteen transect locations from points where the dyke crosses a 5m interval OS contour. The dyke profile in the centre of the transects is a simplified version of the GPS dyke survey showing bank height at the same x and y scales as the topographical profile. The western landscape is shown on the right.









in profile as an indicator of purpose. For example, it has been suggested that the large size of Devil's Dyke (Figure 1) relates to the threat of a full-scale military offensive; in this case perhaps by Mercia against the rival Anglo-Saxon Kingdom of East Anglia (Thackray 1980). Nevertheless, other structural aspects of a Dyke should be considered in a balanced assessment, not least including archaeological evidence for revetments and palisades.

While excavations have sometimes revealed stone and boulder materials at the base of Offa's Dyke, in reviewing such findings, Ray and Bapty (2016 184-188) interpret the evidence mostly in terms of construction practices rather than as the remains of significant widespread revetment construction. In support of a defensive function, Hill (1991, 125) postulated the existence of palisades, walls and pathways on top of the bank. However, in this respect also it is of interest that no actual material evidence of palisades or other structures normally associated with linear defensive structures, such as watch towers, signal stations, roads for the movement of defensive forces, or walkways along the top of the bank have been found (Bell 2012: 107; Hill and Worthington 2003: 125). The latter authors recognised the absence of such evidence as 'one of the main archaeological problems concerning any understanding of Offa's Dyke', nevertheless Hill (1991) observed that 'with or without a wall or palisade...the dyke would have been a very considerable barrier'. However, as is argued below, the utility of Offa's Dyke as a barrier does not necessarily imply a defensive function, especially when other objective evidence is brought to bear, not least on disposition in the wider topography.

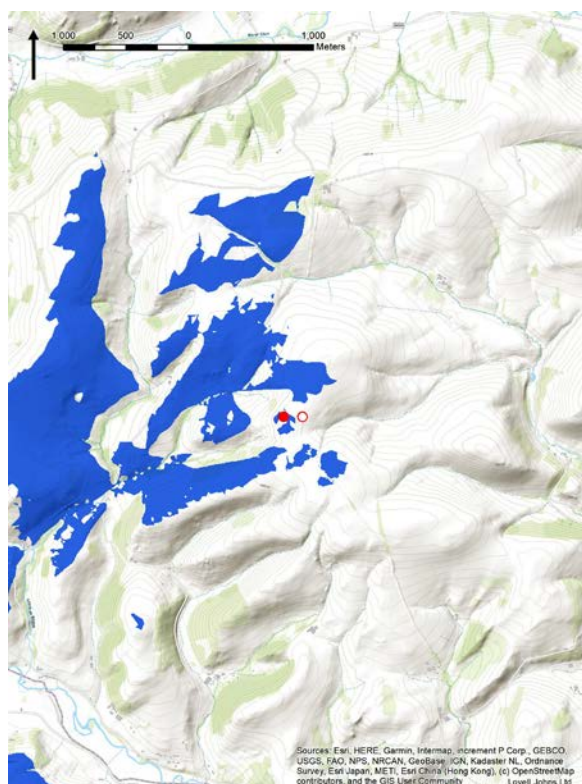
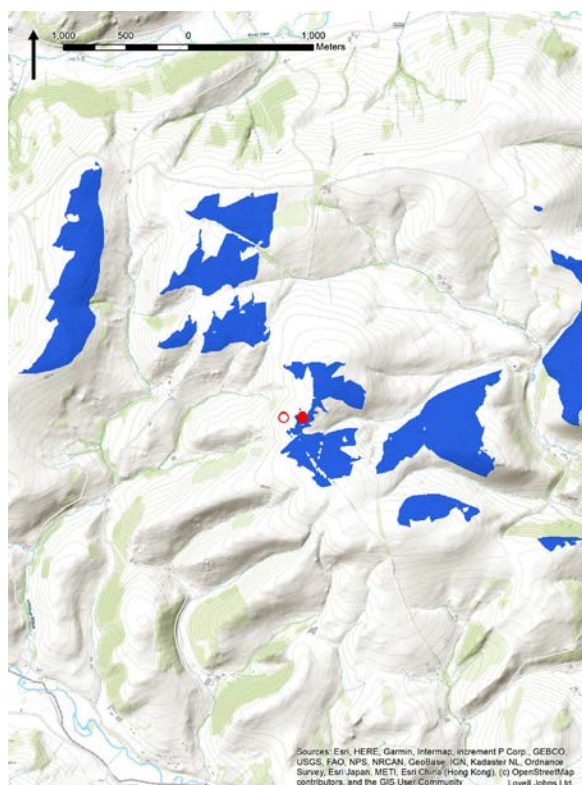


Figure 3: Viewshed maps showing (a: above) the visible landscape from a marked point located on the bank of central Offa's Dyke at Transect 8 (SO 25301 78993) and (b: below) from a near-by point located adjacent to the dyke (SO 25150 78993). The visible landscapes are represented by the blue shaded areas. For each map the red filled circle marks the point from which the viewshed is determined.

Arguments for and against a defensive function

The classic theory about the intended function of the dykes of early medieval Britain is that they were built for defensive purposes, more specifically to act as fortifications against incursion. The earliest reference is in the medieval source, *The Chronicle of the Princes*. In this text Offa's Dyke is referred to as a defensive structure built by Offa of Mercia to help him better withstand attacks from the 'British' kingdoms to the west (Williams 1860: 9). Hill and Worthington (2003) and Grigg (2018) among others, observing that the earthwork would have required major investment and a strong motivation, argue that it was the consequence of a decision by the Mercian monarch to protect the western boundary of his lands with a fixed defence.

According to Stenton (2001: 214), in the early years of the eighth century, the Cymric kingdoms were going through a general

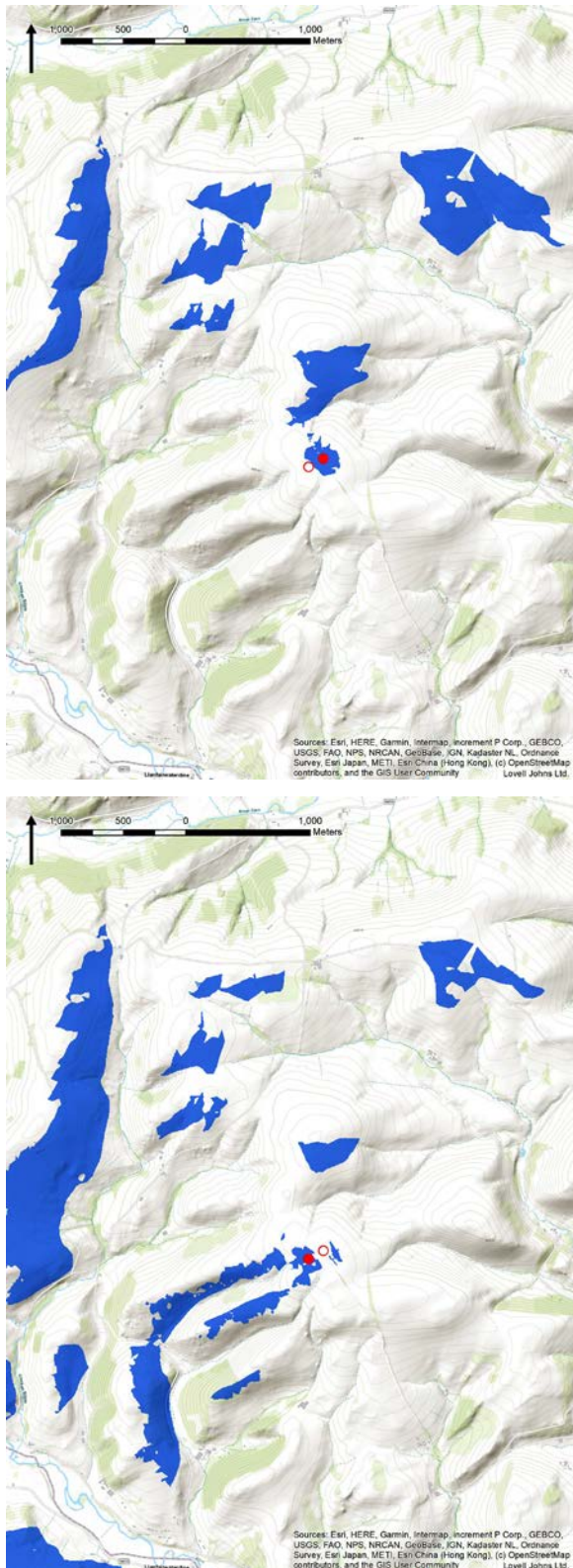


Figure 4: Viewshed maps showing (a: above) the visible landscape from a marked point located on the bank of central Offa's Dyke at Transect 11. (SO 25455 78571) and (b: below) from a near-by point located adjacent to the dyke (SO 25336 78504). The visible landscapes are represented by the blue shaded areas. For each map the red filled circle marks the point from which the viewshed is determined.

revival and, as a result, incursions into Mercian territories had become more frequent and aggressive. Offa responded to these with a famously violent invasion, followed by the construction of the Dyke. Similar to Hill and Worthington, he points out that for more than seventy miles, the Dyke's visible remains rarely fail to command a view of the territories to the west.

When examining the arguments in favour of a defensive function, it is important to note that this category does not necessarily imply that the dyke was built to act as a barrier against larger-scale military incursion, as has been asserted for Devil's Dyke. Bell (2012: 106) suggests that, despite being ineffective against larger forces it could have been designed to hinder the movements of smaller parties, particularly in the case of large-scale cattle rustlers. Hill (2012: 86) accepts this as a potential function also suggesting that longer linear earthworks such as Offa's Dyke could have been

designed to act as early warning systems against incursions using beacons or lookouts positioned along the earthwork.

Conversely, Ray (2020: 122) has expressed scepticism of the cattle raiding theory, pointing out that according to contemporary Anglo-Saxon sources, it was not a uniquely Cymric act. Rather it was an activity conducted by the communities living on both sides of the monument. Additionally, he emphasises that the greater share of cattle crossing the border would have been moving into Mercia, due to the larger number of markets in the more populace lowland Anglo-Saxon territories. This movement of cattle into Mercia will be considered further below, in the context of alternative theories of purpose.

Bell (2012: 106) and Belford (2017: 83) have argued that linear earthworks would be too long to adequately garrison with the resources available to Anglo-Saxon kingdoms at the time. In contrast to Hadrian's Wall, the larger Anglo-Saxon dykes lacked signal stations, defensive towers and roads to facilitate movement. Furthermore, Bell (2012: 106) suggests that while shorter dykes like Bokerly Dyke (Dorset) and Grey Ditch (Derbyshire) would have been easier to build and garrison, they would also have been unable to significantly hamper a determined interloper. Squatriti (2002: 22) goes further, estimating that even the far larger and better organised Carolingian army of the time would have been unable to adequately garrison Offa's Dyke.

Luttwak (1984: 68–69), when considering the frontiers of the Roman Empire, emphasised this point in relation to all linear structures, arguing that even if it was possible to adequately garrison them, linear earthworks are unsuitable to act as fighting platforms against attacks of significant size. He asserts that a primarily defensive purpose would make their construction 'wildly irrational' due to the massive cost and effort required for inevitably inadequate results. This argument can potentially be applied to the Anglo-Saxon kingdoms to a greater degree, due to their smaller economies and different administrative systems when compared to the Roman Empire (Luttwak 1984: 68). Similarly, Davies (2007: 63) and Williams (2019: 49) also support the argument against a defensive purpose for dykes, believing that Offa's Dyke was incapable of acting as a physical barrier and was too long to be adequately garrisoned.

The question of a defensive function for Offa's Dyke relates also to more general questions of Anglo-Saxon defensive strategy. Richards (2009: 165) points out that Offa was one of several Mercian kings who may have invested in the founding of a network of fortified towns or burhs (see also Bassett 2008). In Mercia, the earliest of these settlements could date back to the late eighth century during Offa's reign. This challenges the view that works such as Offa's Dyke were built with an intended defensive function. Instead, in response to quick raids by the Powys Cymry (akin to later Viking incursions), fortified settlements might have been an increasingly effective strategy.

Notwithstanding these various arguments, almost all writers on the subject have recognised that Offa's Dyke's position and how it relates to the surrounding topography are key physical aspects providing insights into its purpose (e.g. Brooke 1963; Stenton 2001; Zaluckyj 2002; Hill and Worthington 2003; Ray and Bapty 2016). This general acceptance of the significance of the dyke's disposition derives from a rational expectation of a direct relationship between the Dyke's form and function: the legitimate expectation that the function of the Dyke must be reflected in its physical characteristics. As such, although disposition relative to the landscape is recognised as of considerable importance as a line of evidence, objective analysis of this matter remains sparse.

However, notable among studies of the dyke in its landscape is that of Murrieta-Flores and Williams (2017) who use digital terrain analysis including viewshed mapping to examine the visual connectivity between key sites in the vicinity of the Cymric monument: the Pillar of Eliseg. Those authors examine the significance of visual connectivity from various positions and in various directions allowing surveillance not just to the west but between strategic positions around the dyke, including from the west to east. This analysis is significant in that it suggests a frontier strategy more sophisticated than that envisaged by a simpler consideration of the dyke in isolation, and marks a step beyond earlier considerations of whether (for example) the disposition of the dyke might be such as to optimise views along its length rather than to the west. As such, it develops the evidence base for the proposition in Ray and Bapty's examination of the dyke as representing part of a more general frontier strategy possibly associated with a westward expansion of the Mercian hegemony (Ray and Bapty 2016: 362–364).

Notwithstanding these advances, a primary purpose of this article is to counter the specific and persistent idea that the dyke is always positioned to optimise western views, from which it is inferred that it served as a defensive structure to counter threats from Powys. Consistent with the present work, Zaluckyj (2002) points out that while much of Offa's Dyke was built on high ground, in many places there are positions of greater elevation only a short distance further into Mercian territory. She argues that if a defensive function was the primary motivation, the builders will have made sure that the Dyke controlled the highest ground to maximize its defensive effectiveness (Zaluckyj 2002: 181). However, as with other authors (such as Noble 1981: 62; Lieberman 2010: 24) who have noticed this phenomenon in the field, the assertion is either anecdotal and/or subjective, in the sense that little systematic analysis has been attempted. Consequently, different authorities reach different conclusions. For example, Hill and Worthington (2003: 120, as quoted above) asserting consistently defensively optimised positioning and Zaluckyj asserting the opposite.

The work reported here represents a small step in improving the evidential objectivity on this question. It shows that references to the dyke 'commanding' the western landscape (Stenton 2001: 212) or always following the west-facing brow of hills to ensure a clear outlook over Powys (Hill and Worthington 2003: 120) are misleading generalisations.

Offa's Dyke, rather than providing a consistently optimal outlook, in fact follows a route which frequently obscures the view of the western landscape. Furthermore, it is also shown how small route adjustments could have provided a more strategically effective outlook: evidence which challenges the credibility of a primarily defensive function.

Other theories of purpose

If not defensive, what may have been the primary function of central Offa's Dyke? When examining strictly political theories, that is to say, boundary marking, it is important to consider the fact that early medieval borders were less clear cut than they are today. Sovereign states were not initially marked by well-defined boundaries and as a result a king's power existed as spheres of influence around certain key royal institutions (Abulafia and Berend 2002: 109). As kingdoms became more organised, their rulers started to put more emphasis on clearly separating the territories, populations and resources to which they had sovereign rights. Increasingly defined borders served to strengthen the level of control (Donnan and Wilson 1999: 15, 48), allowing greater centralisation and influence throughout a kingdom. Defined borders can therefore be seen as marking a stage in the development of the kingdoms that emerged after the fifth-century Roman abandonment of Britain.

Lieberman (2010: 24) for reasons similar to Zaluckyj (2002) claims Offa's Dyke to have been intended as a physical marker of Mercia's western boundary. Consistent with the present findings, he observed that the earthwork often appears to ignore more defensively advantageous positioning. Similarly, Bell (2012: 107) argues that while ineffective as defensive structures, linear earthworks could have been intended to act as previously negotiated boundary lines. Moore (2005: 25) also favours this theory, claiming that the Powys frontier was the territorial limit of consistently effective Mercian kingship. Jones (1976: 16), Fox (1955: 279) and Peers (2012: 138) provide geographical and historical evidence for a negotiated settlement and a political function for the dyke. This is arguably supported by both the earthwork's relatively small size and apparent indifference to the strategic opportunities of the landscape through which it traverses, both of which are reported here.

However, although central Offa's Dyke is, in profile, a relatively small structure (Figure 1), its dimensions are greater than would be necessary simply to mark a border. How might this be explained? An alternative, theory, not incompatible with a political boundary mark, is that the earthwork was built with economic functions in mind. Specifically, by acting as a barrier to the transportation of goods, Offa's Dyke could channel such movements to gates for the purpose of imposing tolls and taxes (Fox 1955: 204; Zaluckyj 2002: 186; Moore 2005: 28). By controlling access to Mercia, the earthwork would serve to facilitate secure trade and taxation for the Mercian state (Malim 2007; Hayes and Malim 2008).

It is postulated that Offa's Dyke may also have served to protect local monopolies on certain goods such as wool. The general idea of wool trade across borders is supported by contemporary textual evidence of the trading of woollen textiles well beyond a local range, including even exports to Frankish territories in mainland Europe (Banham and Faith 2014: 118). This theory is further advocated by Malim (2020: 192) who emphasises the effectiveness of early medieval dykes at impeding the movements of horses and wheeled vehicles, the result being the restriction of trade to strategically beneficial gateways.

More general work on the nature of the Anglo-Saxon economy is also relevant to economic interpretations of Offa's Dyke. Much like the rest of early medieval Europe, the greater part of the Anglo-Saxon population were peasant farmers who subsisted on their own produce, while also often having obligations to a landlord. As a result, agriculture was the dominant basis of the economy, with other industries like manufacturing playing relatively minor roles (Banham and Faith 2014: 2). Evidence suggests that Anglo-Saxon farmers were much less inclined towards extensive crop production than their Romano-British predecessors. It appears that they spent less time on arable cultivation and there is environmental evidence of a bias towards livestock husbandry and away from cereal production (Banham and Faith 2014: 141–142).

Archaeological evidence shows the range of livestock, with cattle and sheep dominating the bone record for the whole of the Anglo-Saxon period (Hamerow 2012: 156). Of these there are indications that the greatest value was put on cattle which were also seen as symbols of power and wealth (Hodges 2012: 54). This is effectively shown by the fact that the notion of theft in Anglo-Saxon law was focused primarily around cattle, and that cattle, property and wealth were related concepts in Old English (Banham and Faith 2014: 2, 86–87). The value of cattle in Anglo-Saxon society is additionally shown in clauses in the Laws of Ine, which in addition to dealing specifically with cattle theft, also address the crime of harboring stolen cattle (Attenborough 1963: 51). In this context with the gradually improving breeds and husbandry of the middle Anglo-Saxon period, the movement of stock for trade increased (Hamerow 2012: 166).

Another factor related to this increasing trade was the development of new proto-urban settlements from the seventh century onwards. This type of settlement, referred to as *wics* in medieval texts, have been described as large semi-permanent markets rather than foci of secular or church government (Hodges 2012), and it has been suggested that they lay at the centre of increasingly elaborate regional economies (Naismith 2012: 32).

In this context it is questionable why control of the movement of livestock has not received more attention as a possible function for Offa's Dyke, especially in light of the many drover's trails along which cattle were moved from the Cymric highlands to lowland markets in Anglo-Saxon territory (Banham and Faith 2014: 14; 196–198; Ray 2020: 122, but see Malim 2007). Colyer (1976) described in detail the habit of bringing cattle down from



Figure 5: An old cattle drover's trail running along the west side of central Offa's Dyke in the study area. The trail is on the left with modern wire fences on either side (Photo: David A. Humphreys)

Cymric Kingdoms into Mercia for fattening and sale. This trade involved long-established drover's tracks, many of which are still apparent in the landscape today.

Colyer (1976: 42–43). describes one of these trails running through a gap in southern Offa's Dyke near Spoad Hill, Shropshire. He further points out the existence of an agreement dated AD 926 between the West Saxon King Athelstan and the borderland Dunsætae people concerning border arrangements across the River Wye. This document, the 'Ordnance concerning the Dunsætae', refers to cattle trails on both sides of the river and establishes the existence of a legitimate cattle trading relationship across the border from at least the eighth century. Although further south than our current study area, this evidence demonstrates the significance and organisation of this trade at the time of Offa.

The use of 'ditched enclosures' to control the movement of cattle in the middle Anglo-Saxon period (Hamerow 2012: 89) also supports the view that the dyke would have provided an effective obstacle to the movement of cattle. No doubt many of the currently known old drover trails were established after construction of the dyke. Nevertheless, the fact that they deflect along the Dyke towards breaches, rather than simply passing

over it corroborates its effectiveness as a barrier to the movement of livestock. In this context, it is of interest that a track running along the west side of central Offa's Dyke at the point of the profile survey (Figure 5) is known to be an old drover's trail (Smith 2013: 107–110). The fact that this trail runs alongside the earthwork further suggests its effectiveness as a barrier to the cross-border movement of stock.

Conclusions

The primary purpose of this article has been to question the evidentially problematic orthodoxy that central Offa's Dyke was constructed by Mercia as a military defence against Powys (Ray and Baptý 2016: 3). In particular, the aim was to challenge the generalisation exemplified by Hill and Worthington (2003: 120) that 'the chosen line always attempts to take a position where there is a clear view to the west'. To this end, topographical analysis inconsistent with such statements is reported. While the current study should be seen as only a precursor to more extensive GIS-based research, it nevertheless demonstrates the utility of such approaches anticipated by Ray and Baptý (2016).

On the basis of the field survey and topographical evidence reported here, it is argued that central Offa's Dyke was not optimised either in position or size to provide an effective barrier to aggressive incursion. This conclusion, examined in the context of the published literature, suggests that central Offa's Dyke should be interpreted primarily as an obstacle rather than a defence. As such, it would have served as an effective barrier to traders and drovers using ox carts or driving cattle to market.

The two basic functionally significant features common to most early medieval dykes are that they are in effect obstacles to movement and that they are built in border areas. For both the Anglo-Saxon kingdoms and Cymric communities, as today, borderlands do not present one challenge, but many. Multiple and complex motivations for different dykes are likely to have existed suggesting that each dyke requires separate study and interpretation. For central Offa's Dyke the evidence presented here is consistent with a primarily economic function which is in turn compatible with theories that the earthwork's route was informed by a political border situated in a frontier zone. In any event the results of the present work are inconsistent with a primarily defensive function.

Acknowledgements

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Exploring Linear Earthworks across Time and Space – Introducing the ‘Monumentality and Landscape: Linear Earthworks in Britain’ Project

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Linear earthworks of a monumental character are an enigmatic part of the British landscape. Research in Britain suggests that such features range in date from the early 1st millennium BC to the Early Middle Ages. While the roles of these monuments in past societies cannot be understated, they remain a relatively under-researched phenomenon. This article introduces the Leverhulme Trust-funded ‘Monumentality and Landscape: Linear Earthworks in Britain’ project, which aims to provide a comparative study of linear earthworks focusing on those dating to the Iron Age and early medieval period. This contribution reviews our approach and shares preliminary results from the project’s first year, identifying wider implications for the study of linear earthworks.

Keywords: linear earthworks; method; Iron Age; early medieval; social complexity

Introduction

The process of dividing the landscape of Britain with linear earthworks is a longstanding one. Varying in scale and form, these delineations are represented by a range of earthworks, from prehistoric pit alignments, Late Bronze Age linear boundaries and early Iron Age cross-dykes to early medieval monumental earthworks. These, often substantial, structures have been argued to serve multiple and overlapping roles including, but not limited to, territorial boundaries, barriers to control movement and/or political frontiers. Whilst recognising the social significance of earthwork construction in the Late Bronze Age and early Iron Age, in Britain many of the most substantial earthworks appear to date to the Late Iron Age and the Early Middle Ages. Yet there has been limited discussion of the extent to which these constructions reflected contrasting or comparable changes in these societies, potentially marking a shift to delineating areas of landscape alongside a demonstrable ability to mobilise and organise large workforces.

This article introduces the ‘Monumentality and Landscape: Linear Earthworks in Britain’ project, which aims to provide a comparative study of the often-monumental banks and ditches of the Late Iron Age and Early Middle Ages. Following a review of past research, the aims, research framework and methodology of the project is presented, followed by preliminary observations of data collected for south-east Britain. The article concludes with an outline of further research to be undertaken throughout this three-year project.

Past research

Research in Britain suggests that there were several phases of linear earthwork construction: the early 1st millennium BC, the Late Iron Age and the early medieval period. Although linear features in the landscape are known from as early as the Mesolithic in Britain and pit alignments and linear earthworks are well known from the Late Bronze Age (Bradley *et al.* 1994; McOmish *et al.* 2002; Murray *et al.* 2009), a spate of monumental linear construction also took place in the Late Iron Age, some related to the phenomenon known as *oppida* (Haselgrove 2016; Moore 2020). While earthworks dating to the earlier 1st millennium BC seem to form part of the demarcation of the farming landscape and perhaps increasing territoriality, those of the Late Iron Age appear to have been part of a different phenomenon. The earthwork systems around the *oppida* extend in some cases for many kilometres, as at Colchester and Chichester, not simply seemingly delimiting settlements but defining areas of dispersed activity and landscape (Haselgrove 2000; Moore 2012; 2017; Garland 2017). These appear to signify a major transformation in the scale and organisation of these societies coinciding with the appearance of greater evidence for kingship, in the form of rich burials and inscribed coinage (Hill 2007; Moore 2017). Associated with these Late Iron Age complexes are a range of other linear earthworks, of monumental form, which appear related to them. Examples include the Scots Dike (North Yorkshire) and the Devil's Ditch (Sussex), each extending for at least 10 km. The role, date and even extent of some of these earthworks remains enigmatic and contentious, yet they appear to have been part of a Late Iron Age use of earthworks to demonstrate the power of emerging polities.

Constructing monumental linear earthworks in the early medieval period has been interpreted within two principal explanatory frameworks. The first places these features in a late fourth- or early fifth-century context of disintegrating Late Roman administration and emergency measures put in place to attempt to fend off Germanic incomers (Myers 1964; Fowler 2001). While the second proposes that they reflect the emergence of the earliest medieval kingdoms in the seventh and eighth centuries, perhaps sometimes related to historically documented events (Reynolds and Langlands 2006; Ray and Baptý 2016; Reynolds 2020: 273) and in some cases repurposing enduring prehistoric earthworks (Bowden 2005: 35–37).

Our current knowledge comes from a series of selected studies of individual earthworks, shown usually to be of either Iron Age or early medieval date. For the Iron Age, these include Ave's Ditch, Oxfordshire (Sauer 2005), the Oxfordshire Grim's Ditches (Bradley 1968; Copeland 1988; Cromarty *et al.* 2006) and the multiple ditch systems of East Yorkshire (Fenton-Thomas 2005; Fiocoprile 2015). Meanwhile, for the early medieval period, considerable attention has been paid to the well-known earthworks of Offa's Dyke (Ray and Baptý 2016; Malim 2020) and Wansdyke (Fox and Fox 1958; Reynolds and Langlands 2006) but relatively little about other linear monuments (but see Grigg 2015). Despite this division, both chronological and scholarly, individual

studies have investigated the longevity of certain earthworks. Some, such as Shire ditch, Herefordshire and some of those earthworks in Cambridgeshire, previously assumed to be early medieval earthworks shown to have origins in the Late Bronze Age or Iron Age (Barber 1999; Bowden 2005; Mortimer 2017).

The socio-political importance of linear earthworks is evident in part by the fact that they form part of a wider phenomenon visible in both Ireland (e.g. Armit 2007; O'Drisceoil *et al.* 2014) and Continental Europe (e.g. Dobat 2008; Tummuscheit and Witte 2019). However, in Britain these earthworks remain an under researched phenomenon in relation to other features, but also in comparison to each other. Indeed, scholarly enquiry has tended to focus upon individual features or regionally distinctive groupings (e.g. the Cambridgeshire Dykes: Malim 1997). The neglected nature of these linear earthworks can be attributed in part to the difficulty of investigation (e.g. Williams and Delaney 2019: 1–5). Current knowledge largely derives from the most substantial and best-preserved examples, mainly studied in relative geographic and chronological isolation (e.g. Aves Ditch: Sauer 2005; Offa's Dyke: Ray and Bapty 2016). While recent research has produced some useful national overviews, the focus has often concentrated on the discussion of specific periods at the expense of others (i.e. Bell 2012; Grigg 2015). In part, these chronological concerns stem from insecure dating evidence, which makes cross-comparison difficult. However, it can also be suggested that the main reason for the lack of a more in depth cross-period comparative study is due to the compartmentalised study of 'cultural' periods as traditionally defined in British Archaeology. As such there has been a historiographic tendency to focus on the early medieval role of these earthworks, either to link them specifically to this period and/or specific events.

The 'Linear Earthworks in Britain' project aims to rectify the imbalance of previous research by a thorough reassessment of the corpus in its wider landscape and cultural context (UCL and Durham University 2020). This article outlines the aims and approaches of this venture as well as some preliminary observations from the investigation of these earthworks so far. While the outputs of academic projects largely follow completion, the impact of the Coronavirus pandemic has restricted our ability to engage with fellow scholars through conferences and other presentations. This publication seeks to connect with interested parties and to solicit feedback in the early stages of our project to enhance our approach to data collection and modes of analysis.

Introducing the 'Linear Earthworks in Britain' project

'Monumentality and Landscape: Linear Earthworks in Britain' is a Leverhulme Trust-funded three-year research project hosted by the UCL Institute of Archaeology and the Department of Archaeology, Durham University (UCL and Durham University 2020). Our project seeks to understand how and why human societies chose to delineate landscape in such a highly visible form and why such socio-political behaviour is evident particularly in the Late Iron Age and the Early Middle Ages. While we note

the significance and will record earlier linear monuments, including Late Bronze Age earthworks such as the so-called ranch boundaries, pit-alignments and cross-ridge dykes found in many regions, our project focuses on considering the wider context of the more substantial Late Iron Age and early medieval linear features. Our investigation will assess social complexity through the lens of societal and organisational capacity and shed light on a fundamentally important shift in human behaviour and political identity during each of these periods. We do not have the space here to fully explicate the complexities of the comparative aspects of our project, but there are many parallels to be drawn between these two periods. These factors include comparable political territories in spatial terms, coin use, evidence for social elites with similar material expressions (i.e. burials), the building of fortifications and the emergence of urban places. Although beyond the scope of this interim publication, exploring such comparisons has fundamental implications for understanding the landscape of Britain, including more generally the ways in which social, political and territorial identities emerged and changed over time. A further aim of our project is to establish whether a clear scale-change in monument construction can be detected both within later prehistory as well as before and after the Roman period.

Despite prior research, there remains a fundamental need to understand the range and nature of linear earthworks across Britain, the major monuments having attracted the greatest attention over the years. Our project will gather information from across Britain to compile a standardised national dataset, which will allow us to characterise the physical attributes of these earthworks and to establish a geographical distribution which can be compared to a range of topographical and archaeological phenomena. In addition, by collecting data for all the known archaeological investigations for each linear earthwork we will be able to determine the nature and quality of dating evidence for each and—where possible—to establish a clear chronology of individual earthwork biographies over time. With such an overview in place, we will then seek to distinguish relationships between linear earthworks, the natural environment and evidence for human occupation on a regional level, in part by carrying out high-resolution survey and targeted archaeological investigation. The regional data will be contextualised at a local scale by examining specific case studies alongside other known archaeological evidence such as settlement patterns, field systems and distributions of material cultural relating to specific social and cultural groupings. At this local scale, these methods will also allow us to study the role of linear earthworks as part of wider social and political changes across these periods.

The project began in March 2020 and runs until March 2023. During our first year we have assessed in detail the surviving evidence for linear earthworks in south-eastern Britain and collated records of all known archaeological fieldwork concerned with these monuments. Below we outline the progress of the project in the first year, including our consideration of how we define these monuments, the structure of the national dataset and insights from our initial data collection.

Definition and interpretation

The study of linear earthworks has resisted imposing a strict definition on the form and/or function of such monuments, and instead presents a wide array of descriptions and interpretations. In part, this diversity has been inspired by the differences observed within period-specific research traditions. Linear earthworks of the early 1st millennium BC in south central Britain have often been characterised as ‘ranch’ boundaries (Crawford and Keiller 1928; Hawkes 1939; Cunliffe 2005: 420–422). Interpretations of their roles varies; some regard these as part of a greater emphasis on pastoralism (Cunliffe 2005: 589) or perhaps delineating agricultural estates (McOmish *et al.* 2002: 64–65). Most argue these features acted as a form of territorial definition (Fowler 1964; Sharples 2010: 46) with the location of some relating to Iron Age hillforts (Cunliffe 1994). Other, smaller, linear earthworks known as cross-dykes probably defined areas of settlement or for the corralling of animals (Sharples 2010: 45–46) while others, like that at Kidlandlee, Northumberland, might have been used to control existing routeways (Oswald 2010). There has also been an increasing discussion of the role of linear earthworks in facilitating and controlling movement of livestock both in southern Britain (Tilley 2004) and for the complex of linear earthworks in East Yorkshire (Fiocoprile 2021). Interpretations of some other, seemingly Late Iron Age, linear earthworks have been variously described as representing ‘tribal’ (Sauer 2005; cf. Moore 2011) or territorial boundaries (Lambrick 2009: 70), while more complex systems have been interpreted as defining the extents of territorial *oppida* (Haselgrove 2016; Garland 2017; Moore 2020). By contrast, and as discussed below, early medieval scholarship proposes additional explanations focusing on their defensive and militarised aspects (Reynolds 2013) or the formalised delineation of borderlands into physically attested frontiers (Ray and Bapty 2016; Reynolds and Brookes 2019).

That period-based perspectives have produced contrasting theoretical and conceptual approaches is a matter of considerable interest in our enquiry (Moore *et al.* in prep). While many prehistorians increasingly regard one aspect of Iron Age linear earthworks as channelling movement through the landscape (Fiocoprile 2021), defining areas of assembly or choreographing new forms of power (Moore 2012; 2017; Garland 2017; 2020), contemporary early medieval scholarship regards these monuments as expressions of the boundaries and/or frontiers of early medieval kingdoms constructed with a raft of specific intentions (Reynolds and Langlands 2006; Ray and Bapty 2016). The scale and naming of many of the major early medieval dykes, for example, allows them to be read as a means of creating and imposing political identity through collective action either voluntarily or, perhaps more likely, in the context of increasing ties of lordship and legal obligation (Reynolds and Langlands 2006; Reynolds 2013). Wansdyke and Offa’s Dyke appear to be named with reference to a deity or ancestor, while the very many ‘Grim’ names found in association with such earthworks can be seen to be of equivalent type, with Grim representing a cognate of Woden among Germanic societies (Stevenson 1902, 629, n. 10). In addition, a strong case has been made that both the eighth century King Offa and his eponymous dyke were named after a heroic ancestor found in the earlier (probably 6th

century) figure found in the Mercian royal genealogy (Yorke 2005, 16). By combining the approaches of prehistorians and early medievalists, our large-scale comparative analysis will examine these periods together, thus providing an opportunity to understand how the construction of linear earthworks was connected to the emergence of complex societies. This approach also addresses the chronological complications that are so often ascribed to these linear earthworks. While previous research has tended to consider linear monuments as period-specific and from a socio-political perspective, the scale and physicality of these earthworks indicates that, once built, they had the capacity to structure landscape organisation in subsequent periods. It is also possible in later periods to define a series of specific behaviours in relation to linear features, including conflict, assembly, fairs and public execution (Brookes and Reynolds 2019).

The ambiguity of interpretative terminology is visible also in the disparity between definitions across UK-based heritage bodies. In England, the characterisation of linear earthworks falls within period specific boundaries (Historic England 2018a) or as representative of particularly large-scale examples (e.g. Offa's Dyke) (Historic England 2018b). While Historic Environment Scotland (HES) highlights the 'substantial' nature of these features, the definition specifically relates to dividing "adjacent landholdings" (Historic Environment Scotland 2021). The division of landholdings is equally present in the definition provided by the Royal Commission on the Ancient and Historical Monuments of Wales (RCHAMW), with the caveat that the majority 'date from the late Bronze Age and Iron Age' (RCAHMW 2021). In each instance, these variations likely reflect local and regional differentiation in the archaeological evidence, as well as denoting dominant assumptions about the role of these monuments.

Consequently, for the purposes of our project the definition of linear earthworks remains necessarily broad as: a substantial demarcation of landscape in the form of monumental banks and ditches of varying morphology dating to the period between c.800 BC to c. AD 800. As part of the project we expect to produce a classification with metrological parameters. The chronological range of our project allows us to explore earthworks over the *longue durée*, while focusing on those that traditionally date to the Iron Age and early medieval periods. At this stage, we have excluded earthworks designated as 'cross-ridge dykes', in part due to the large numbers found in the UK, but also due to their evident topographical distinctiveness as a monument type. Within several case study regions, we aim to assess the evidence for linear earthworks dating to the period c. 800 BC to c. AD 800 alongside the evidence from the Bronze Age, and features such as cross dykes to assess the relationship between these different earthwork types. This approach allows us to contextualise linear earthworks against the wider temporal and spatial use of linear earthworks to define landscapes over time.

Research framework

Our project will provide for the first time a British corpus of linear earthworks within a relational database to understand the shaping of the British landscape. This national corpus represents the largest of three scales of analysis undertaken by the project. This

will be followed by an exploration of topography, movement and landscape position through eight regional case studies and finally their relationship to the emergence of polities and social transformation through four local case studies. The principal output will be a print and online *Atlas of Linear Earthworks in Britain*.

The baseline data for the extent and character of all British linear earthworks is being obtained from national historic environment records (HERs) including the National Record of the Historic Environment (NRHE), Canmore: National Record of the Historic Environment for Scotland and the National Historic Assets of Wales (Cadw). For specific regions, the initial data collection is being supplemented with data from local HERs, to provide the spatial extent of individual earthworks and references to any associated archaeological fieldwork. The importance of consulting local and national HERs reflects the wealth of new information uncovered through developer-funded archaeology. Similar recent British research-led archaeological projects have demonstrated the advantages of understanding archaeological monuments and landscapes through the consultation of archaeological grey literature (Fulford and Holbrook 2011; 2018). For linear earthworks, many of the small-scale archaeological investigations undertaken in developer-funded environments have received limited publication and little synthesis in relation to wider archaeological and historical knowledge (see below). The collation of all known data for linear earthworks across specific regions will allow us to enhance existing local and national HERs by depositing our findings once the project is complete.

The relational database was created within a PostgreSQL database management system and has been designed to incorporate several, multiscale, cross-referenced data tables (Table 1). The database will incorporate information relating to individual earthworks, as commonly defined in existing monument records (e.g. Grim's Dyke) and, where available, specific archaeological investigations along each earthwork. Care has been taken to ensure that the project database is compatible with UK Heritage datasets to allow data sharing following completion of the project. These measures include adhering to the minimum level of information required for recording heritage assets, as outlined by MIDAS (English Heritage 2012), and the use of compatible terminology. Where possible we have utilised accepted vocabularies from the Forum on Information Standards in Heritage (FISH 2020), which is supported by UK and European data infrastructures, via the Ariadne Project (ARIADNE 2012).

PostgreSQL is an open-source object-relational database (PostgreSQL Global Development Group 2021), which can be extended to store and manipulate spatial data using PostGIS (POSTGIS Project 2021). Most major GIS software packages (e.g. QGIS, ArcGIS) and powerful scripting languages (e.g. R, Python) interface directly with PostgreSQL databases to facilitate the use of a wide range of analytical spatial tools and will streamline data analysis. Once data collection is complete we will utilise this sophisticated set-up to examine earthwork morphology and landscape setting, calculate labour estimates for earthwork construction (e.g. Harris 2021) and trace mobility through the landscape in accordance with these physical barriers (e.g. Fioccaprile 2021; Verhagen *et al.* 2019).

Table 1: Outline of database structure

Table name	Table description	Sub-table	Sub-table description
Earthwork	Summary description of overall earthwork		
Intervention	Description of archaeological fieldwork undertaken at specific points along each earthwork	<i>Investigation type</i>	Type of archaeological fieldwork (e.g. excavation, geophysical survey, watching brief)
		<i>Dating evidence</i>	Type of dating evidence (e.g. radiocarbon dating, OSL, pottery, artefacts, stratigraphic relationship)
		<i>Earthwork Structure</i>	Arrangement of earthwork features (e.g. ditch and bank, ditch only, ditch with two flanking banks)

To assist with earthwork detection, characterisation and analysis, baseline environmental data will also be collected for each regional area of interest. These geospatial datasets include background mapping (Ordnance Survey mapping – 1:25,000), historic mapping (Historical Ordnance Survey maps of Great Britain – 6-inch and 25-inch editions), aerial imagery (via Edina Digimap), elevation data (primarily airborne LiDAR from the Environment Agency), hydrology, bedrock and superficial geology (British Geological Survey) and historic land use classifications. Earthwork transcriptions from the National Mapping Programme (Historic England 2021) will be consulted if required to assist in mapping the route of linear earthworks.

Preliminary observations

To test the structure of the database, one region of Britain was initially targeted for data collection and analysis. South East Britain, here taken as incorporating the English counties of Oxfordshire, Berkshire, Hampshire, East and West Sussex, Surrey and Kent (Figure 1), was chosen as an area that includes both well-investigated linear earthworks (e.g. the South Oxfordshire Grim’s Ditch), but also comparatively under researched regions (e.g. Kent). As it currently stands, the dataset includes 101 separate earthworks and a record of 204 individual archaeological investigations. Labelled here as ‘interventions’, these entries relate to each specific piece of archaeological fieldwork undertaken at an individual point along each linear earthwork. Details from more general surveys of monuments are included in the database as part of the summary for each earthwork. This dataset provides a suitable sample from which preliminary observations can be made regarding the investigation of linear earthworks across Britain. The following analysis will be updated once the full dataset has been compiled to facilitate an examination of regional patterns of archaeological investigation of these monuments.



Figure 1: Plan of study area with extent of known linear earthworks in south-east Britain. Contains OS data
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Earthworks

Preliminary data collection for the south-east suggests that there are relatively low numbers of earthworks in most counties, with exceptions (Table 2). High numbers of recorded earthworks appear in both Hampshire and West Sussex and reflect the presence of two Late Iron Age territorial *oppida*: Silchester/Callewa and Chichester/Noviomagus Reginorum respectively. Each of these settlements is defined by an extensive system of linear earthworks each of which has received significant archaeological attention (Williams-Freeman 1934; Bradley 1971; Creighton and Fry 2016; Fulford *et al.* 2016, 2018). These studies have provided detailed investigations of each of the linear earthworks in these large-scale systems which have subsequently been entered into the project database as individual entities.

Table 2: Number of linear earthwork monuments and interventions per modern administrative county

County	Number of earthworks	Number of interventions	Average interventions per earthwork
Berkshire	5	6	1.200
East Sussex	2	0	0
Hampshire	35	80	2.280
Kent	7	13	1.850
Oxfordshire ¹	6	51	8.500
Surrey	8	1	0.125
West Berkshire	12	24	2
West Sussex ²	26	30	1.150
Total	101	204	0.495

Of the total 101 earthworks, 49 (48.5%) have been subject to archaeological investigation, with an average of two interventions per earthwork, although there is variance between counties (Table 2). The data suggest a high instance of investigation in Oxfordshire in comparison to elsewhere in the south-east, which is unsurprising considering the large number of well-known linear earthworks in the region and the long history of archaeological investigation in that county. Notable among surveys and excavations are those of the North Oxfordshire Grim's Ditches (Harden 1937; Thomas 1957; Fine 1976; Chambers 1978; Copeland 1988), the South Oxfordshire Grim's Ditch (Bradley 1968; Hinchcliffe 1975; Cromarty *et al.* 2006) and Aves Ditch (Sauer 2005). Despite such interest in investigating linear earthworks, the total area of each investigation is very limited. Table 3 shows several representative linear earthworks (one for each county),

¹ Includes information from Oxford City Historic Environment Record.

² Includes information from Chichester District Historic Environment Record.

each with an estimated percentage of the feature investigated to date. A proxy was used for the size of each archaeological intervention to allow cross comparison between counties (Trench 2, Brocas Lane Linear – 2m width, 25 m length, 75 square metre area – Fulford *et al.* 2016: 8). This figure was multiplied by the number of interventions along each earthwork and divided by its length. As shown, the overall percentage of a linear earthwork investigated can vary between 0.1–1.1% of its total length. This observation demonstrates that interpretations of the form and date of monuments are based on extremely limited areas/extents of investigation.

Table 3: Representative examples of scale of investigation of linear earthworks in South-East England (rounded to the nearest metre)

Linear name	Number of interventions	Length (m)	% investigated	Reference
South Oxfordshire Grim's Ditch (Oxfordshire)	9	18867	0.09	Bradley 1968
Grim's Bank, West Berkshire	6	3466	0.34	O'Neil 1943
Brocas Lane Linear, Hampshire	2	920	0.43	Fulford et al. 2016
Chichester Entrenchments EWA(i), West Sussex	7	6236	0.45	Bradley 1971
Faesten Dic, Kent	9	1632	1.1	White 2020

Table 4: Number of investigation types for linear earthworks in South-East England

Intervention type	Pre-1990	Post-1990	Total
Excavation	93	29	122
Evaluation	16	14	30
Watching brief	12	10	22
Geophysical survey	0	9	9
Auger survey	1	5	6
Topographic survey	4	2	6
Casual observation	4	0	4
Desk-based assessment	0	3	3
Field visit	1	1	2
Total	131	73	204

Intervention type

Table 4 provides a breakdown of the different investigation type defined for each intervention along the linear earthworks of the south-east. The FISH thesauri for

'Events' was utilised to determine the terminology for each intervention type to ensure conformity across the dataset and standardisation with other heritage databases (FISH 2020).

Archaeological investigations are intrusive by nature (60%, n=122), likely reflecting a desire by researchers to understand structure and/or chronology. Of the total number of interventions (n=204), the majority (64%, n=131) were undertaken before the advent of developer-funded archaeology in the UK, defined here by the introduction of 'Planning Policy Guidance 16: Archaeology and Planning' (PPG16) in 1990. In addition, a larger proportion of interventions prior to PPG-16 were represented by excavations, with a greater diversity in archaeological techniques applied post PPG-16 (Table 4). These changes reflect advances in archaeological methodology in the last 30 years, but also greater protection in that many linear earthworks are now nationally designated heritage assets (Scheduled Monuments), requiring a higher threshold of scrutiny from national heritage bodies before intrusive fieldwork is allowed. Changes in interventions in this region pre- and post- PPG16 reflects the development of archaeological fieldwork in Britain in the last century. Prior to 1990 a larger number of interventions were undertaken by local societies (51%, n=67) or academics (36%, n=47), while post PPG-16 most interventions were undertaken by commercial archaeological companies, likely resulting directly from developer-funded archaeology (62%, n=45).

Interventions: sources of information

Of the main sources of information for each intervention, encouragingly the vast majority (75%, n=149) are fully published. Only 25% (n=55) of the total represent unpublished (grey literature) reports or appear only as personal communications in HER records. Of the interventions that took place in the post-PPG16 era (after 1990, n=73), approximately 67% are unpublished (n=49). Most of these references are drawn from grey literature reports on piecemeal investigations by commercial archaeological companies ahead of development (e.g. North Oxfordshire Grim's Ditch, Charlbury: Wessex Archaeology 2006). Much grey literature is now available online, either via the websites of commercial archaeology companies or via the Archaeology Data Service, although they can be easily overlooked, highlighting the need to consult local HERs, especially for more recent investigations.

Exploring publication outlets (Table 5), almost 50% (n=73) of interventions are published in county journals. This aspect perhaps highlights the geographic isolation in which many linear earthworks were investigated, driven by local research questions (and societies) rather than a wider comparative perspective. The remainder of the published investigations are to be found in various academic volumes and in national journals, such as *Archaeologia*, *Proceedings of the Society of Antiquaries of London* (precursor of the *Antiquaries Journal*) and, in some cases, *Britannia*. While national journals are mostly available online, albeit through subscription services, county journals have a variable

online presence. This aspect makes research difficult in certain regions, especially during the Covid-19 pandemic where access to archives has been restricted.

Table 5: Source for published data for each intervention

Publication type	Number
County journal	73
Book	38
National journal	35
Local newsletter	3
Total	149

Table 6: Source for dating evidence per intervention

Dating evidence	Number
None	119 (58.3%)
Pottery	59 (28.9%)
Stratigraphic	10 (4.9%)
Radiocarbon dating	9 (4.4%)
Luminescence dating (OSL)	3 (1.4%)
Artefacts	2 (<1%)
Coinage	1 (<1%)
Morphology	1 (<1%)

Dating evidence

Data from the south-east indicate that for most interventions, approximately 58.3% (n=119), no dating evidence (either artefacts or ecofacts) was recovered (Table 6). Although several interventions lacking dating evidence represent non-intrusive surveys, 53% (n=96 of total 180) of interventions produced no dating evidence at all. This general trend emphasises our poor understanding of the chronology of linear earthworks across the UK which, despite advances in dating techniques, has not improved over time. Of the archaeologically dated interventions 71.7% (n= 61 of 85) were undertaken prior to 1990, while 28.3% took place after 1990 (n=24 of 85). Of the interventions with dating evidence, the majority (n=59 of total 85) were characterised by small assemblages of pottery recovered from beneath or within bank deposits (e.g. Wallingford bypass: Cromarty *et al.* 2006), providing an approximate date of construction, or from ditch deposits, representing at least part of the period during which the ditch remained open. Most interventions dated by ceramics (61%, 36 of total 59) were represented by pottery recovered from ditch fills. As many of the earthworks remain partially open to

the present, dating evidence from the ditch fills remains problematic for providing a *terminus ante quem* for earthwork construction.

It is clear from these statistics that only a small fraction of interventions (14.1%, n=12 of total 85) in the south-east region is dated by scientific means, such as radiocarbon dating or optically stimulated luminescence (OSL). Of these, there are only three instances dated prior to 1990, reflecting the growth of the use of scientific dating techniques in archaeology. For most examples where radiocarbon determinations were made, only single dates were obtained, either from environmental material found beneath the bank or in one instance from within ditch fills (i.e. Allen *et al.* 2018). Recent excavations as part of the Silchester Environs Project utilised a suite of radiocarbon dates to provide a clearer chronological picture for linear earthworks surrounding the Calleva *oppidum*. Several environmental samples were analysed for both the Wood Farm and Brocas Land linear earthworks providing dates for each in the Middle to Late Iron Age (Fulford *et al.* 2016). For isolated instances where OSL was utilised (n=3), each example was taken from primary ditch deposits where a bank was absent, usually due to later truncation. OSL dating was undertaken from two different interventions through a probable linear earthwork beneath the city of Oxford (Sturdy 2004); one intervention at St John's College provided a Bronze Age date, while the second at New College School (MOLA 2019) was dated to the Late Iron Age (Oxford Archaeology 2018). The third instance represents the use of OSL to date the Devil's Ditch, Chichester, West Sussex (Doherty and Garland 2015). Due to the high gravel content of the ditch fills, however, the dating method could only provide a broad Iron Age date. Although not ideal, in the case of the Devil's Ditch, disagreement over the date of the earthwork in past investigations could be resolved using this technique (Holmes 1968; Bradley 1969; Bedwin 1982).

Dating evidence: rating

A rating system was devised to enable a rapid assessment of the reliability of dating evidence for each intervention in the database (Table 7). The rating system ranged from 5 (no dating evidence) to 1 (multiple sources of dating evidence including scientific dating). Less than 1% of the total interventions fell into the highest category, with only 21.5% (n=44) ranked 3 or above.

The data demonstrate the scarcity of the application of scientific dating techniques to linear earthworks in the south-east. For securing tighter chronologies it is vital that such techniques are employed in future, particularly considering the materially sterile nature of many earthwork deposits. Moreover, as has been demonstrated elsewhere, linear earthworks are often constructed and developed in multiple phases over time (e.g. Scots Dike: Haselgrove 2016: 25). All opportunities for developing detailed chronological models should be adopted. Detailed strategies for scientific dating should be developed prior to investigation to ensure that multiple methods are applied to individual sequences. A prime example of complex stratigraphy in linear earthworks

and the application of an array of approaches can be seen at the Late Iron Age *oppidum* at Bagendon, Gloucestershire and the investigation of the so-called Dyke ‘E’ (Moore 2020: 164–171). Here, radiocarbon determinations from land snails were obtained due to poor preservation of organic remains and, alongside a detailed examination of the stratigraphic sequence, suggest that the earthwork likely dates initially to the Middle Iron Age (fourth to third century BC) (Moore 2020: 349–350).

Table 7: Rating system for reliability of dating evidence for each intervention

Rank	Description	Number	%
1 (high)	Robust dating evidence from multiple sources (incl. scientific dating) to substantiate date of earthwork	2	0.9%
2	Moderate levels of dating evidence that correspond with each other to substantiate date of earthwork	8	3.9%
3	One or more types of supporting evidence available found within a secure stratigraphic sequence	34	16.7%
4	Limited supporting evidence to substantiate date of earthwork: i.e. small quantities of material discovered out of context	42	20.7%
5 (low)	No dating evidence present	118	57.8%
	Total	204	100%

Further research

Having completed detailed data collection for the south-east, our project now turns to finalising a characterisation of known earthworks across Britain, incorporating national databases for England, Scotland and Wales. We will then shift focus to several regional studies, collating and analysing comprehensive datasets for each area. Building from the lessons learnt through the collection of data for the south-east, we continue to refine our database structure and to incorporate our findings into planning our second year of research.

Targeted fieldwork is essential to explore the complex chronologies of these monuments and to better understand the long-term biographies of linear earthworks. Adopting a staged methodological approach, sample excavations (of monuments currently being selected) will follow an UAV (unpersoned aerial vehicle) photogrammetry survey of each location, as well as topographic and geophysical surveys of selected areas in and around each excavation trench. Our choice of case studies will focus on poorly dated examples that are likely of a Late Iron Age or early medieval date but will also be determined by a range of factors including regionality, relationships with other features and issues of access. These surveys will complement information gained from excavations about the structure and changes present in different areas but will also allow us to contextualise

the excavation results within a wider understanding of activity both along the earthwork and in the surrounding landscape. Excavations will allow for a detailed examination of earthwork stratigraphy to understand construction of earthworks and sequences of infilling (ditches) and levelling (banks) over time. Most importantly, a detailed program of scientific dating will be devised and employed to build a detailed chronology for each earthwork. Our approach will incorporate multiple methods, where material is available, include new approaches such as optically stimulated luminescence profiling and dating (OSL-PD), which incorporates in-field measurements (Vervust *et al.* 2020) alongside radiocarbon dating and Bayesian modelling (e.g. Hamilton *et al.* 2015). In part, this dating methodology will be achieved via a comprehensive environmental sampling strategy, taking detailed sequences of samples throughout the earthwork stratigraphy. The investigation of archaeobotanical evidence, including pollen and charred cereals, will allow us to build a picture of the environments surrounding excavated monuments and how this changed over time.

In the final year of our project, the evidence from the detailed regional studies and the results of fieldwork will form the basis for several detailed polity-level case studies (i.e. of regions selected to reflect both Iron Age and early medieval political territories). These fine-grained analyses will allow us to interrogate the relationships between earthwork construction and increasingly territoriality and social complexity. Importantly these case studies will also allow us to comparatively explore how and why these societies chose to delineate the landscape in the ways that they did and with such impressive monuments.

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Rethinking Wat's Dyke: A Monument's Flow in a Hydraulic Frontier Zone

Howard Williams

Britain's second-longest early medieval monument – Wat's Dyke – was a component of an early medieval hydraulic frontier zone rather than primarily serving as a symbol of power, a fixed territorial border or a military stop-line. Wat's Dyke was not only created to monitor and control mobility over land, but specifically did so through its careful and strategic placement by linking, blocking and overlooking a range of watercourses and wetlands. By creating simplified comparative topographical maps of the key fluvial intersections and interactions of Wat's Dyke for the first time, this article shows how the monument should not be understood as a discrete human-made entity, but as part of a landscape of flow over land and water, manipulating and managing anthropogenic and natural elements. Understanding Wat's Dyke as part of a hydraulic frontier zone not only enhances appreciation of its integrated military, territorial, socio-economic and ideological functionality and significance, most likely the construction of the middle Anglo-Saxon kingdom of Mercia, it also theorises Wat's Dyke as built to constitute and maintain control both across and along its line, and operating on multiple scales. Wat's Dyke was built to manage localised, middle-range as well as long-distance mobilities via land and water through western Britain and beyond.

Keywords: coast, hydraulics, Offa's Dyke, river, water, Wat's Dyke, wetland

Introduction

Wat's Dyke is a c. 62–64km-long linear earthwork comprising a bank and ditch. Often over-shadowed in archaeological discussions by its longer and better-known neighbour Offa's Dyke, the monument is heavily damaged in many sections of its length. Yet, fieldwork has demonstrated it was originally a near-continuous structure built along the edge of the Welsh uplands. It runs from the Dee estuary at Basingwerk (Flintshire) in the north (SJ 195 775) to the Morda Brook at Lower Morton south of Maesbury (Shropshire) in the south (SJ 305 233) (Fox 1955; Hill and Worthington 2003: 163; Malim and Hayes 2008; Belford 2019; Worthington Hill 2019; Malim 2020a).¹ Its date and relationship with Offa's Dyke remain foci for ongoing debate (Fitzpatrick-Matthews

¹ The Offa's Dyke Project by David Hill and Margaret Worthington made a strong case for the Dyke's continuous nature and charting it further south than hitherto recognised (see Hill and Worthington 2003: 163; Worthington Hill 2019; Hill 2020). Subsequent investigations have supported the monument's presence at historic gaps (see Malim and Hayes 2008), including most recently through the fieldwork by Clwyd-Powys Archaeological Trust (Belford 2019). However, inevitably it remains impossible to demonstrate on current evidence that the Dyke was continuous along the tops of steep scarps overlooking many of the watercourses under discussion in this article. It remains possible that the scarp itself, together with palisades and other obstructions, provided sufficient barriers in some situations.

2020; Ray 2020; Malim 2021). Multiple stages of construction are possible, and its initiation during the fifth–seventh centuries AD remains a possibility (Malim 2020a). Yet, its final form finds closer parallels and a viable historical context as a frontier work of the Anglo-Saxon kingdom of Mercia during the eighth or early ninth centuries AD (Malim and Hayes 2008; Malim 2020a, 2021).

Yet, how did Wat's Dyke operate as a landscape monument within a broader west Mercian frontier zone? By examining its topography in locales where it remains a prominent earthwork and in those stretches where its placement can be inferred by survey, I argue that this early medieval linear earthwork can be reinterpreted as an integral element of a hydraulic frontier zone for Mercia in which the manipulation and control of water was key. This is revealed in the monument's careful placement in relation to, and utilisation of, a range of different watercourses and wetlands, as well as estuarine and maritime environments.

The argument presented in this article is inspired by Ray and Bapty's (2016) investigation of Offa's Dyke's landscape context. I recognise their arguments have implications for understanding Wat's Dyke's precise placement and function at specific locales, but also prompts a broader consideration of the monument's landscape context on a regional scale in relation to routes of movement over land and water. Furthermore, I also identify an additional, new, macro-scale maritime context for Wat's Dyke of Mercian frontier interaction beyond Wales. I refer to that as Mercia's 'Irish Sea zone', extending across western Britain and Ireland (see also Griffiths 2010; Swallow 2016).

Wat's Dyke is thus reconsidered in relation to concepts of 'flow': both pertaining to observing, controlling and curtailing movement over land and also the manipulation of movement in and over water, perhaps even incorporating explicit hydraulic components (see Edgeworth 2011). Significantly, I argue that this flow, perhaps augmenting longer-term traditions of landscape utilisation from prehistory and the Roman period (cf. Malim 2020a), was both overland and across and along watercourses and wetlands. Moreover, the mobilities being manipulated by Wat's Dyke were biaxial. In other words, this early medieval linear earthwork not only observed and controlled transverse movement as usually understood. In addition, the line of the monument itself connected and controlled movement between the watersheds of the Severn and the Dee. The idea of a 'hydraulic frontier zone' is thus evoked to conceptualise the monument as 'powered by'/'driven by' its interactions with water.

Background: introducing Wat's Dyke

Running along the western edge of the Midlands plain, Wat's Dyke is a west-facing bank-and-ditch with occasional hints of counterscarp bank and eastern ditch (Figures 1 and 2;

Figure 1: Sir Cyril Fox’s 1932 map of Wat’s Dyke redrawn and revised in response to David Hill and Margaret Worthington Hill’s fieldwork (Hill 1991, 2020; Worthington 1997; Worthington Hill 2019). The numbers indicate the figure numbers for the 12 locations discussed in depth in this article (Figures 3–14) (after Fox 1955: figure 117)

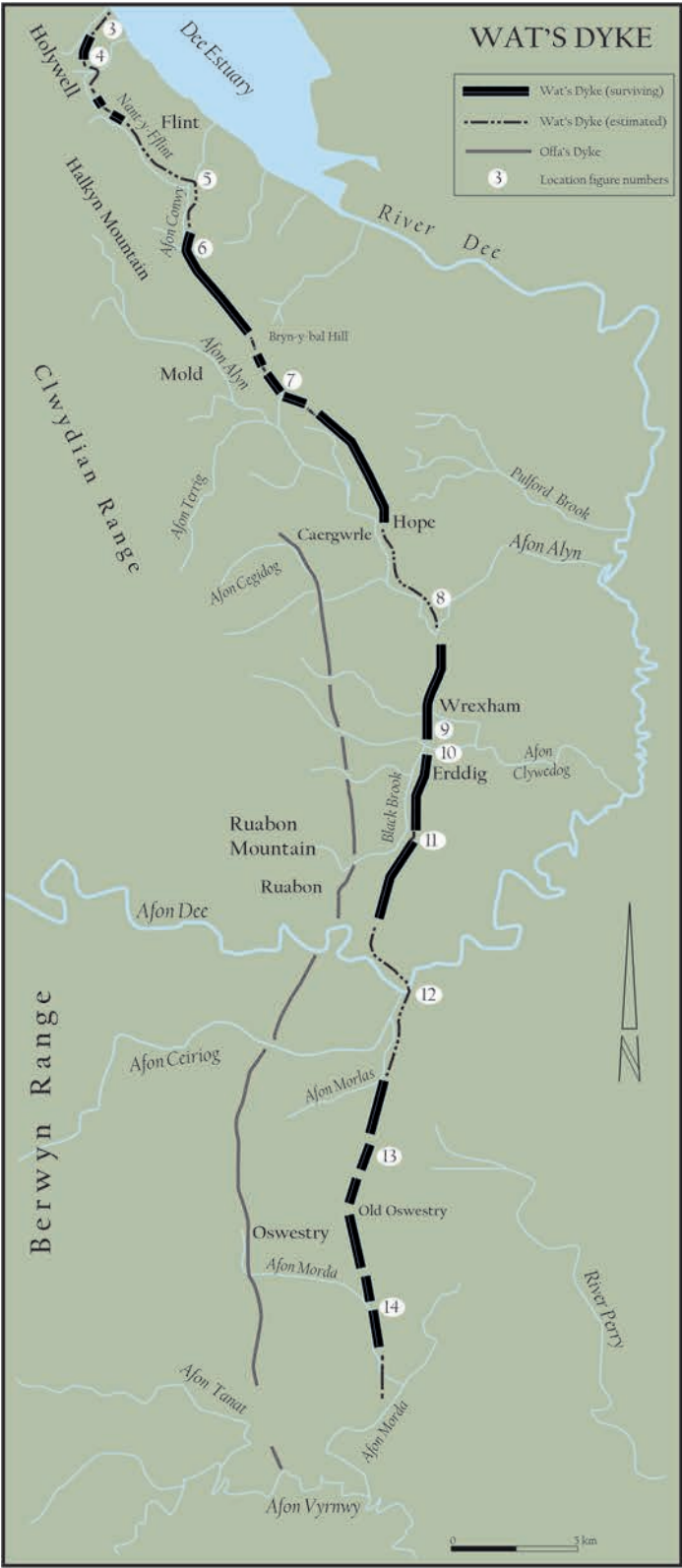




Figure 2: Wat's Dyke at Soughton Farm, Flintshire. 2a (above): looking north along the bank with the ditch to the left (west), SJ 236 677. 2b (below): looking south along the bank with the ditch to the right (west), SJ 237 677 (near point 6 on Figure 1, see also Figure 6), Photographs: Howard Williams, 2019



Fox 1955: 258).² The monument has been far more heavily damaged than Offa’s Dyke and it has received only one systematic published survey, by Sir Cyril Fox (1934, 1955: 258). Subsequently, a host of small-scale archaeological surveys and over 70 excavations have taken place (Worthington 1997; Worthington Hill 2020), however nearly all have been partial, inconclusive and/or have to date reached only interim publication (Hill 1991; Worthington 1997; Hannaford 1999; Malim 2007; Worthington Hill 2019; Hill 2020; Malim 2020a; but see Belford 2019). There has not been a systematic modern survey of Wat’s Dyke and only a single large-scale, open-area excavation of the monument using modern methods and techniques has reached publication: Gobowen, Shropshire (Malim and Hayes 2008).

Unsurprisingly, it is fair to say Wat’s Dyke remains a neglected and relatively poorly understood monument (Edwards *et al.* 2017: 25). Still, excavations have confirmed through scientific dating techniques (radiocarbon dating and Optically Stimulated Luminescence dating, OSL) that Wat’s Dyke was unquestionably built in one or more stages during the Early Middle Ages. While it remains possible it began life as smaller sections of earlier earthworks, it has been postulated that Wat’s Dyke took on its final form and significance *after* the late eighth-century construction of Offa’s Dyke during the early ninth century (Malim and Hayes 2008; Malim 2020a; Malim 2021).³

Fox’s survey and subsequent excavations have been able to show that the monument was carefully and consistently surveyed and constructed. It was installed along a straight trajectory across open country. Where encountering dramatic topography, it utilised breaks of slope on valley sides and the tops of steep valley slopes (Fox 1955: 261–267; Malim and Hayes 2008: 175).

Wat’s Dyke’s V-shaped ditch was cut to at least 2m deep in most places, perhaps even up to 4m in specific locales (Malim and Hayes 2008: 166–168, 177; Worthington Hill 2019: 64). The original scale and character of the earth-and-stone bank is difficult to determine with confidence, but it was at least 1.5–2m high in places, with a cobble stone core.

We can but speculate regarding its original appearance: the bank was perhaps revetted with stone or turf. A timber palisade may well have topped this revetment (Fox 1955: 253–259; Hill 1991, 2020; Malim and Hayes 2008: 166–168, 177; Worthington Hill 2019: 63; see also Ray and Bapty 2016: 183–184). The careful planting of thorn bushes and/or stakes in the ditch might have further enhanced its role as a formidable barrier (see Hill 1991, 2020).

An original berm has only been identified in one location: Mile Oak, Oswestry (Hannaford 1999; Malim and Hayes 2008: 177). As with Offa’s Dyke, a different mode of

² For an alternative reading of counterscarp banks, see a preliminary discussion by Williams (2016) for Big Wood, Erddig.

³ Fitzpatrick-Matthews (2020) queries the certainty of interpretation derived from the Gobowen OSL dates by Malim and Hayes (2008). See Malim (2021) for a response. New dates are eagerly awaited following excavations at Erddig (Wrexham) (see Belford 2019) and in the Greenfield Valley (Flintshire) by Clwyd-Powys Archaeological Trust.

construction was used in places where it overlooked steep valley sides (Worthington Hill 2019: 63; for Offa's Dyke builds, see Ray and Bapty 2016: 170–171).

Given our limited evidence, we can only speculate regarding the character and scale of the infrastructures originally associated with Wat's Dyke. These might have included bridges and causeways, gates, watchtowers, beacons, forts, routeways and settlements. We cannot discount such installations: no excavations have been conducted of a scale and quality to locate such dimensions had they been components of the Mercian frontier (cf. Ray and Bapty 2016: 228–251; Ray *et al.* 2021). Fox (1955: 261) identified at least two possible historic openings in Wat's Dyke, although it remains unclear whether these are original. We simply do not know how many gateways (if any) there were through the original monument and where they were situated.⁴

While Fox (1955) regarded Wat's Dyke as an intermittent or unfinished work, subsequent investigations lean towards the conclusion it was originally a near-continuous build running south between Basingwerk (Flintshire) on the Dee Estuary to join the Morda Brook near Maesbury (Shropshire) (Hill 1991, 2020; Hill and Worthington 2003; Worthington 1997; Malim and Hayes 2008: 147–149; Belford 2019; Worthington Hill 2019) (Figure 1). Excavations have revealed evidence for the possible re-cutting of the ditch even if there is no evidence that the bank was maintained or rebuilt (Malim and Hayes 2008: 169, 177). The scale and consistent character suggests it was a formidable obstacle that could have significantly impeded the movement of people and animals and was at least in part a military construction (Malim and Hayes 2008: 178; Grigg 2018). Whatever its original intended use, Wat's Dyke seems to have had some enduring influence on the Anglo-Welsh borderlands through the tenth, eleventh and twelfth centuries (Worthington 1997; Swallow 2016: 291–296; Worthington Hill 2019).

Wat's Dyke has received only sporadic broader scholarly attention. Recent work has considered its comparable morphology to Offa's Dyke, but also aspects of its placement that stand in contrast with its more westerly companion earthwork. Specifically, Wat's Dyke was built to join together a series of prehistoric fortifications, including Old Oswestry and Bryn Alyn hillforts and possibly other now-lost monuments such as a postulated prehistoric promontory fort later subsumed into the construction of the Anglo-Norman Erddig motte-and-bailey castle (Malim and Hayes 2008; Swallow 2016). The association with at least two wells dedicated to St Winifride, and the proximity to St Oswald's well might suggest that aspects of sacred geography might have factored in its placement too, although we cannot securely date the cults and dedications of these holy wells precisely (Fox 1955; Malim 2020a).

⁴ Fox (1955: 261) noted two demonstrably pre-modern gaps, one in Hope parish, Flintshire (between 7 and 8 on Figure 1), the other at Henlle Hall, Shropshire, (between 12 and 13 on Figure 1).

In all these regards, Wat’s Dyke’s lowland stance contrasts with Offa’s Dyke (Malim and Hayes 2008: 177; Ray and Bapty 2016: 23–25; Ray 2020). Furthermore, there have been new insights regarding its immediate landscape context, placement and viewsheds proposed which directly inform the study here because they reveal how the Dyke would have visually and materially dominated access to and along the Midlands plain (Murrieta-Flores and Williams 2017). Furthermore, Wat’s Dyke has been integrated into broader surveys and syntheses on early medieval linear earthworks and their potential military, territorial, socio-political, economic and symbolic functions and significances (Malim 2007; Bell 2012: 72–75; Grigg 2018: 38, 54–55, 64–83, 99). In addition, there has been recent attention to the heritage conservation, management and interpretation of the earthwork (Belford 2019; Swogger 2019; Williams 2020a; Swogger and Williams 2020, 2021). New work also sheds light on Wat’s Dyke’s broader significance in terms of public archaeology and heritage politics (McMillan-Sloan and Williams 2020; Williams 2020b).

Despite this attention, Wat’s Dyke has remained largely over-shadowed and neglected in favour of discussions of Offa’s Dyke (e.g. Hill and Worthington 2003: 161–163; Ray and Bapty 2016). Indeed, in broader surveys of the middle Anglo-Saxon kingdoms, the monument receives sparse attention and can get overlooked completely (e.g. Higham and Ryan 2013: 52–54; Hunt 2016: 76, 79d).

Rethinking Wat’s Dyke

Reconsidering Wat’s Dyke as a monument constructed to monitor and regulate mobilities, but specifically through careful placement in relation to movement over and along watercourses and other water features, we can entertain various scenarios and postures of deployment in relation to not only early medieval conflict but also in terms of long-distance communication routes and more localised quotidian routines of travel and resource exploitation. These might vary seasonally as streams and rivers rise and fall and wetlands expand and contract. Yet, by considering the linear earthwork as part of a ‘hydraulic’ frontier zone, integrated with both overland routes and routes along and across watercourses, I extend the suggestion of Sir Cyril Fox (1934; 1955: 252) that the southern end of Wat’s Dyke might constitute a canalised stream, a precursor perhaps to broader developments in later Anglo-Saxon hydraulic engineering (Blair 2007; Sayer 2009). Furthermore, I expand more explicitly on Tim Malim’s (2007) invaluable discussion of both Wat’s Dyke and Offa’s Dyke in relation to both land and water routes (see also now Malim 2020a and b). This approach encourages a more sustained evaluation of the relationship between linear earthworks and *flow* of water itself, but also how dykes configure *land flow* (Edgeworth 2011: 107–127; see also Fiocoprile 2021; Gibson 2021).

My approach regards linear monument as multi-functional. They cannot be considered as barriers built exclusively to impede and intercept armies and raiding parties. Equally they were not built merely primarily as a symbolic expression of territoriality or regal ideology and authority. Considering them to be ‘borderlines’ is also an anachronistic conception.

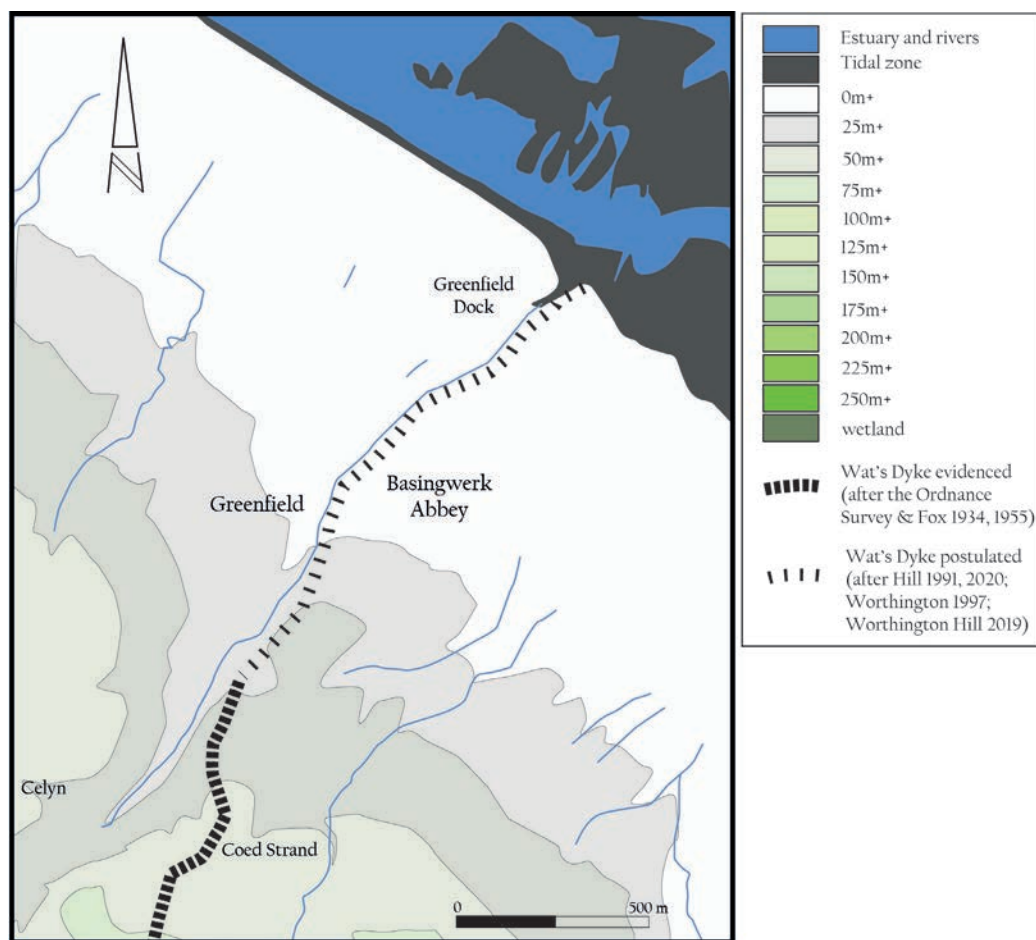
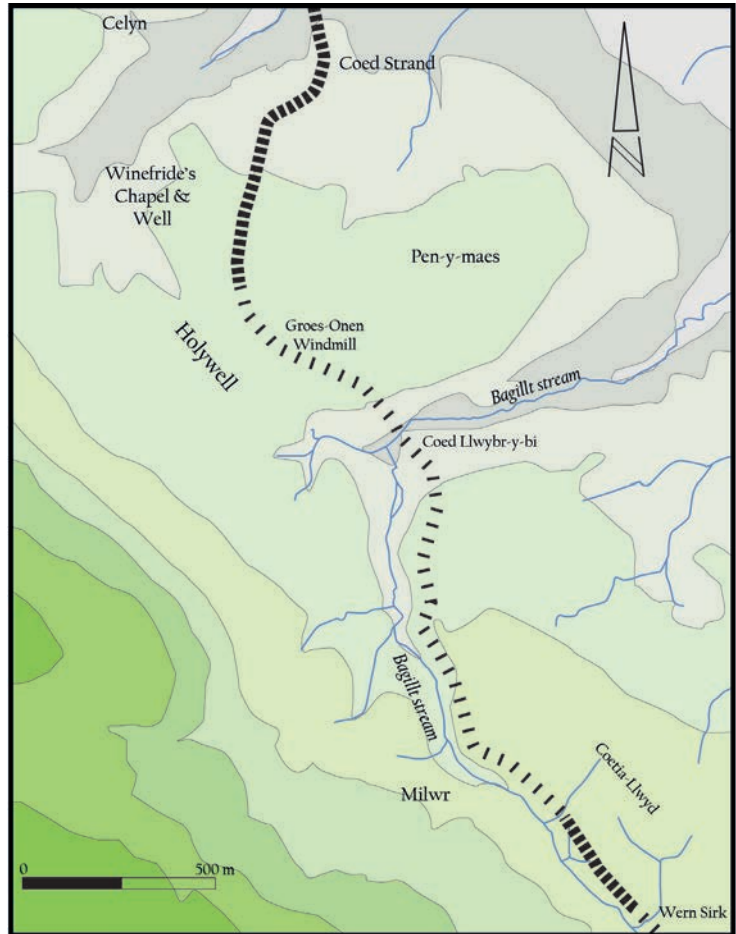


Figure 3: Wat's Dyke from Coed Strand to Basingwerk Abbey, Flintshire, SJ 195 775. The key also applies to Figures 4–14, in each case differentiating between Wat's Dyke 'evidenced', i.e. based on surviving earthworks recorded by the Ordnance Survey, Fox (1934, 1955) or subsequent fieldwork and those sections postulated but supported by largely unpublished fieldwork (see Hill 1991, 2020; Worthington 1997; Worthington Hill 2019; Hayes and Malim 2008)

In contrast to each of these contrasting stances, a topographical and specifically hydraulic investigation enhances our appreciation of how early medieval linear earthworks operated as components of broader zones of surveillance and controlling resources, trade and warfare. This is possible by focusing attention on both the localised landscapes around Wat's Dyke as well as longer-distance patterns of *flow*. In regards to the latter, I refer to its 'audience' as not only Mercian and Welsh, but encapsulating a range of British and Irish kingdoms and communities but also the western frontiers of Mercia's rival Anglo-Saxon kingdoms: Wessex and Northumbria (see also Swallow 2016).

To evaluate this hypothesis, I created (i) a new simplified set of topographical maps for 12 key stretches where Wat's Dyke is demonstrable from surviving earthworks and/or

Figure 4: Wat’s Dyke at the crossing of the Bagillt Stream at Coed Llwybr-y-bi, Flintshire, c. SJ 192 756 (for key, see Figure 3)



archaeological excavations, or else strongly suspected based on comparative analogy; (ii) a revised version of Malim’s (2007) regional map in order to show how Wat’s Dyke might have operated in relation to key land routes and watercourses; (iii) a map showing Wat’s Dyke in relation to the Irish Sea zone for the first time.

There are limitations to this approach. I do not attempt to evaluate the entire length of the extant monument as surveyed by Fox (1934; 1955), but to consider key points of interaction and intersection with watercourses in particular. Equally, given the relative sparsity of material cultures and identifiable early medieval sites of this borderland region (see Clarke 2020: 114–115), I do not attempt to systematically contextualise the earthwork in relation to the broader distribution of early medieval archaeology in the region: that would be for a wider investigation. An inevitable further challenge of this approach relates to preservation: Wat’s Dyke survives worst in lower-lying stretches where fluvial action as well as later agricultural, industrial and habitation has destroyed it. Still, this multi-scalar mapping exercise allows consideration of how the monument’s design and placement facilitated the observation and manipulation of biaxial flow of different scales of mobility in the early medieval landscape.

The broader implications for frontiers studies are worth identifying before we proceed. This investigation establishes the potential for future, fine-grained, fieldwork and analyses of Wat's Dyke's placement and landscape interactions (Belford 2019; see also Murrieta-Flores and Williams 2017) as well as the basis for future comparative work regarding the similarities and differences between Wat's Dyke and its longer sister-monument – Offa's Dyke – in comparable terms (see Ray and Bapty 2016; Ray 2017; Delaney 2021). In turn, this perspective provides groundwork for re-evaluating our broader understanding of early medieval linear earthworks' landscape affordances across the island of Britain and beyond, as well as prompting further consideration of linear features of other periods in 'hydraulic' terms during their design, construction, initial use and subsequent life-history (cf. Moore 2012, 2017; Symonds 2020; Fiocoprile 2021; Garland *et al.* 2021). I consider watercourses and wetlands as active components in how linear earthworks dominated and controlled mobility and resources in specific localities, over the middle-range and over long distances, not simply as convenient and 'obvious' frontier lines (cf. Breeze and Dobson 2000: 15–16; Breeze 2019: 92–117).⁵

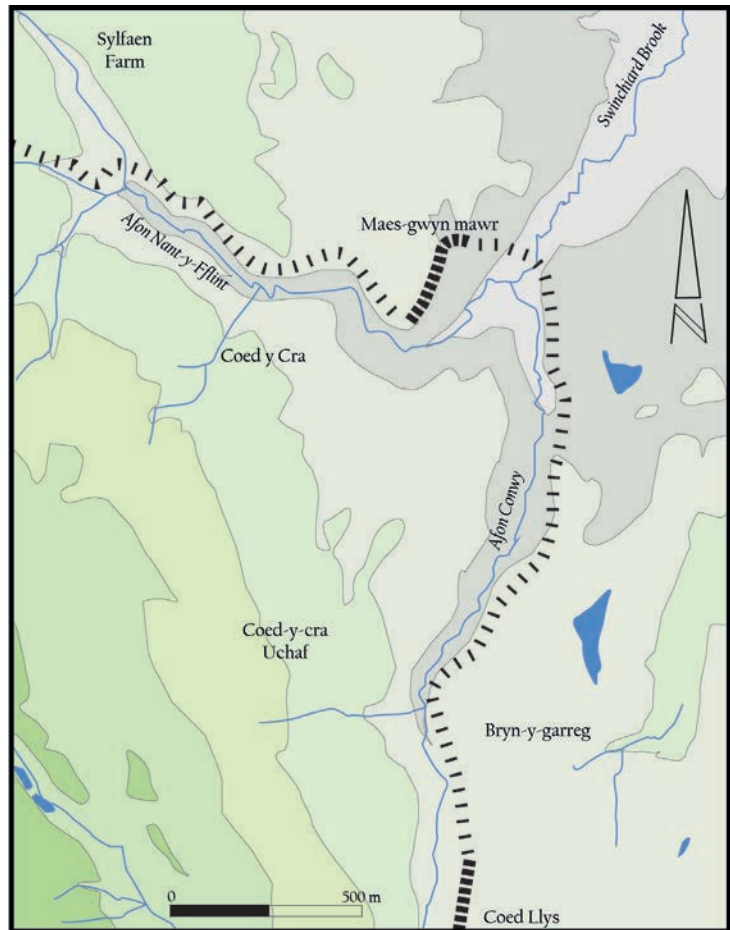
Following watercourses and wetlands

Wat's Dyke utilised watercourses comprehensively. Indeed, Sir Cyril Fox believed that Wat's Dyke was constructed with 'great skill' to utilise ravines in order to reduce the length of 'artificial frontier line' for around half its full extent (Fox 1955: 227, 271, 283). Notable instances of Wat's Dyke's demonstrable and postulated 'tactical' (Fox 1955: 260) use of valley-sides and steep valley slopes are (from north to south):

- the Greenfield valley to Coed Strand (Figure 3; Fox 1955: 228–229);
- from Coed llwybyr-y-bi at the crossing of the Bagillt stream along the Bagillt Stream and the Afon Nant-y-Fflint to the confluence with the Conwy (Figures 1, 4 and 5; Fox 1955: 229);
- the Conwy valley from the Swinchiard Brook south to Coed Llys and Coed Uchaf (Figures 1, 5 and 6) (Fox 1955: 230);
- The Black Brook, Padeswood Pool and associated marshes beside the Alyn at Padeswood (Figure 7; Fox 1955: 234–235);
- the River Alyn (Figures 1 and 8; Fox 1955: 237–238);
- the Clywedog north of Erddig (Figures 9 and 10; Fox 1955: 239–241);
- the Black Brook from Erddig south to Clwt Cottages (Figures 1, 10 and 11; Fox 1955: 241–243);
- the Afon Dee and the Afon Ceiriog at their confluence (Figure 12; Fox 1955: 245–246);
- the Morlas Brook where it joins the Ceiriog (not in one of the twelve sections selected for this study, but an integral part of the stance of Wat's Dyke postulated to follow the tops of scarps overlooking the Dee and Ceiriog: Figure 1; Fox 1955: 245–246);

⁵ For discussions of middle-range mobility, see Gibson 2021.

Figure 5: Wat’s Dyke at the confluence of the Afon Nant-y-Fflint and the Afon Conwy near Maes-gwyn mawr, Flintshire, c. SJ 233 712 (for key, see Figure 3)



- Afon Morda, from Pentre-coed southwards to Maesbury (Figures 1 and 14; Fox 1955: 251–253).

This reconstruction incorporates long stretches where the monument has not demonstrably survived and its former presence might be doubted. Still, in overall terms this identifies and confirms Fox’s (1934, 1955) evaluation of the careful placing of the monument in the landscape. Put together, these fluvial stretches of Wat’s Dyke constitute 32.3km of the estimated 64km length of the original monument (50.5%). While this evaluation takes an optimistic and maximal view on the original length of the monuments and much cannot be confirmed regarding their precise line and character, it is evident that, where possible, Wat’s Dyke utilised watercourses as integral dimensions of their courses. While bodies of water in this landscape were far from impassable barriers (see Hill 1991, 2020), few, if any, would have been navigable, and then only to coracles. By impeding the people and animals crossing them, but still allowing movement across (and possibly along, with the aid of a coracle) at certain points, the streams and rivers unquestionably marked critical routes of overland movement through the landscape. By taking these stances on the tops of slopes or significant breaks of slope on valley sides, Wat’s Dyke was situated to visually dominate, observe and

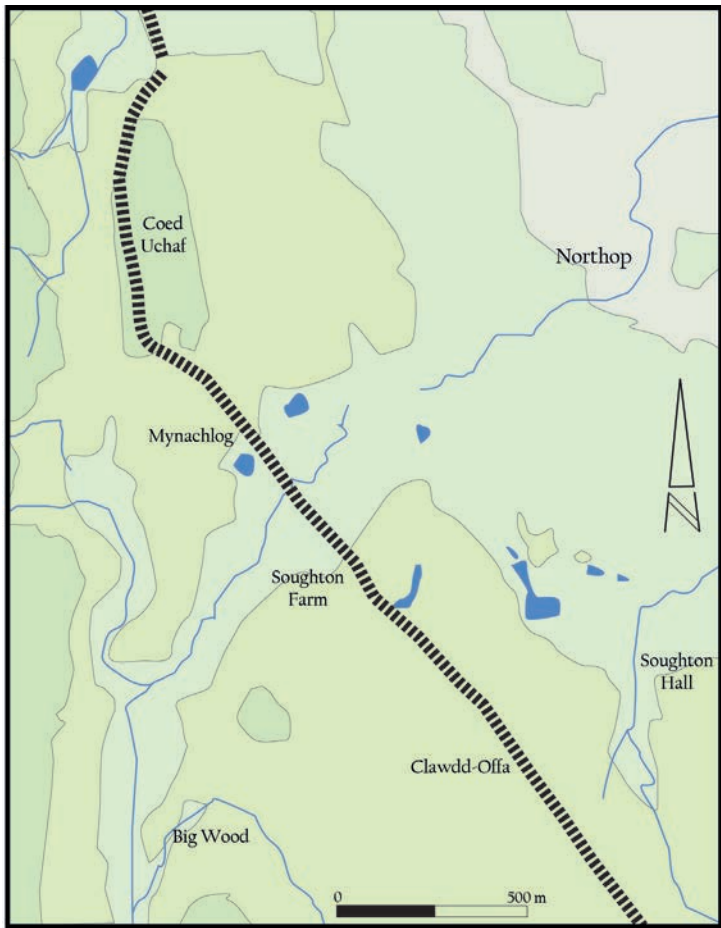


Figure 6 (left): Wat's Dyke near Mynachlog, Northop, Flintshire, SJ 234680 (for key, see Figure 3)

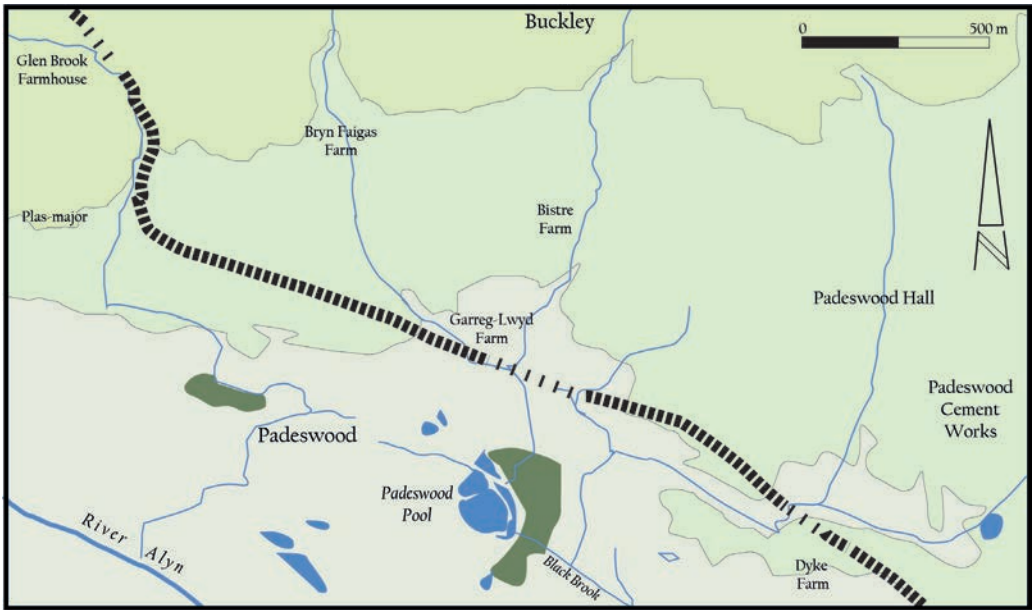
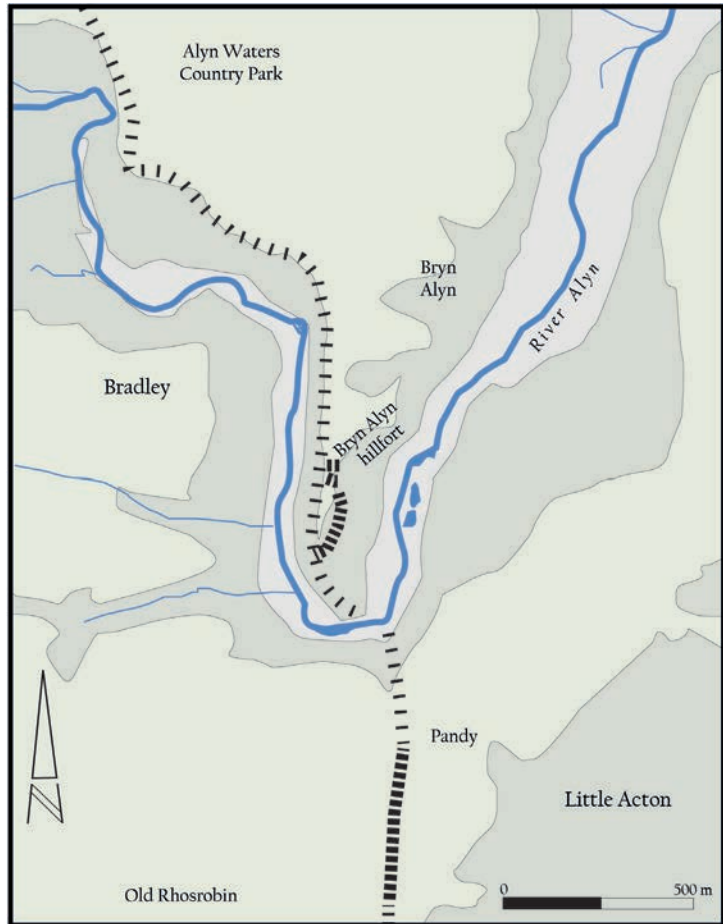


Figure 7 (below): Wat's Dyke around Garreg Lwyd Farm, Padeswood, Flintshire, SJ 274 624 (for key, see Figure 3)

Figure 8: Wat’s Dyke running along the eastern scarp about the River Alyn to Bryn Alyn hillfort, Wrexham, SJ 331 535, and then crossing the Alyn and running south up-slope through Pandy (for key, see Figure 3)



thus control movement both along and across these valleys. In this way the earthwork instigated biaxial control of the landscape by working in conjunction with the streams and rivers, and also by monumentalising the entire valley slopes overlooking watercourses.

The comparison with the far longer Offa’s Dyke is instructive: a monument constructed anywhere between 145km and 200km in length (see Ray 2020; Delaney 2021). The monument’s relationship with bodies of water awaits systematic future investigation, and for this study it is difficult to estimate precisely. Still, as a crude estimation, it seems a similar overall fraction to Offa’s Dyke overlooked valleys and ran parallel to watercourses: c. 40km of the c. 145km course where the monument survives (c. 27% of the monument’s length) (Ray and Bapty 2016: 1), although this proportion increases significantly if rivers like the Severn and Wye are postulated to have served as proxies to the frontier in a comparable fashion to that envisaged in the case of Wat’s Dyke (Ray and Bapty 2016: 145–146, 152–154). This also applies for Offa’s Dyke north of the crossing of the Vyrnwy where the two earthworks run broadly parallel to each other over long distances. No more than 8.5km of the c. 37km stretch of Offa’s Dyke between Llanymynech Rocks (on the Shropshire/Powys border) and Coed-talon Banks (near Treuddyn in Flintshire) follows a valley (in other words around 23% of

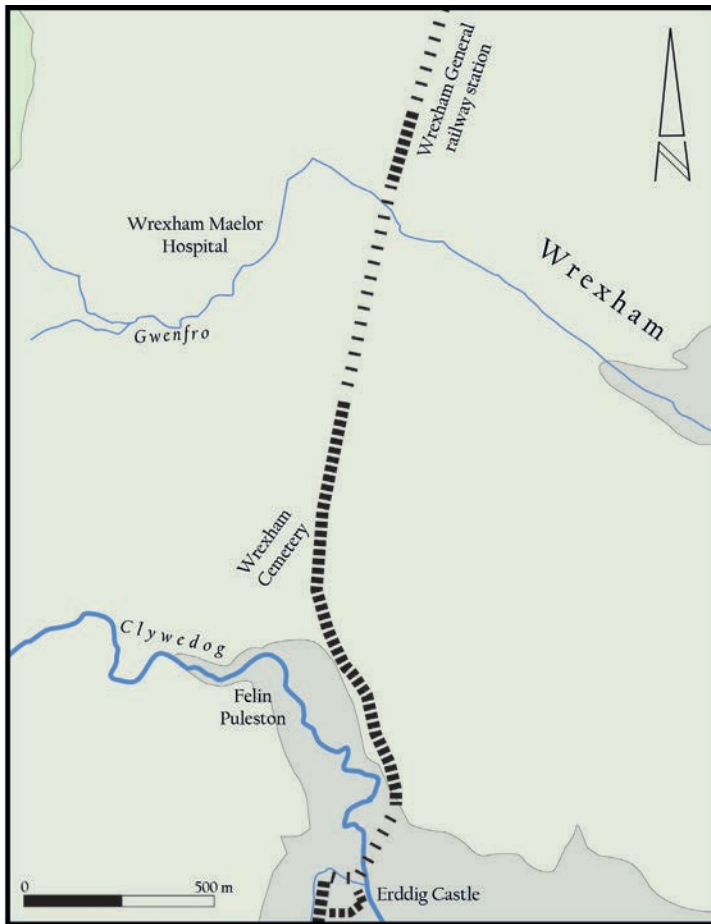


Figure 9: Wat's Dyke crossing the Gwefro and joining the scarp overlooking the Clywedog before crossing the Clywedog to follow the Black Brook. Today the Dyke runs past Wrexham General Railway Station and Wrexham Cemetery SJ 327 495 (for key, see Figure 3)

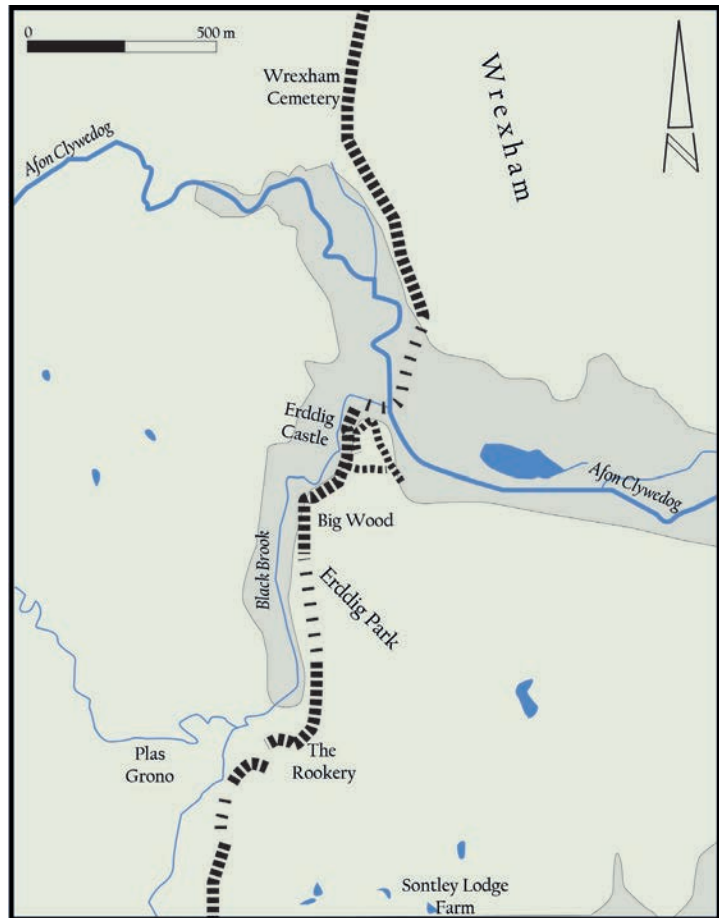
Offa's Dyke's northern stretch overlooks river valleys). Thus, by adopting a stance at the base of the Welsh hills, Wat's Dyke is far more efficient in utilising valleys than Offa's Dyke to its west (see also Murrieta-Flores and Williams 2017).

It is still unclear which earthwork was built first and whether they were coterminous as active monuments (Ray 2020). Still, it is evident that Wat's Dyke achieved a relationship with its topography comparable to that established by Offa's Dyke along the Wye in particular, while the northern stretches of Offa's Dyke did not. This underpins Fox's determination that 'Wat's Dyke is, in its zone, a much more reasonable frontier against the Welsh than Offa's dyke, much easier to hold' (Fox 1955: 275; see also Malim and Hayes 2008: 177 who regard it as a 'tactical retreat' from the line of Offa's Dyke, postulating Wat's Dyke as later). In the context of this study, this contrast also articulates the enhanced significance of Wat's Dyke's watery interactions.

Crossing and blocking watercourses

The invaluable and detailed observations by Ray and Bapty (2016), affords us a more detailed appreciation of how Wat's Dyke's larger companion, Offa's Dyke, was placed in

Figure 10: Wat’s Dyke at Erddig Castle, Wrexham, SJ 327 486, before heading through Erddig Park along the top of the scarp overlooking the Black Brook to The Rookery (for key, see Figure 3)



relation to larger watercourses, seemingly in contrast to its treatment of smaller streams and brooks (Ray and Bapty 2016: 147–148, 151–156). For the largest rivers, Offa’s Dyke crosses on its route (Dee, Severn and Wye), the Dyke follows the river for significant stretches; perhaps the rivers *became* the monument (Ray and Bapty 2016: 129–131). For medium-sized rivers such as the Lugg and the Clun, the Dyke heads for specific crossing points, often adapting its course to overlook approaches with ‘oblique oversight’ and thus overlooking and ‘stopping up’ the valleys (Ray and Bapty 2016: 137–142). For the numerous smaller rivers and streams it crossed, Offa’s Dyke seemed to make little compromise to its longer-distance stance, crossing perpendicular to the watercourse (Ray and Bapty 2016: 136). However, impeded by the earthwork’s poor survival, this behaviour awaits detailed mapping and analysis in a systematic and comparative fashion for Wat’s Dyke. Still, the available evidence hints that Wat’s Dyke operated in a comparable fashion to the strategies of placement identified by Ray and Bapty for Offa’s Dyke. Wat’s Dyke was positioned to frame and dominate points where it crossed and blocked major watercourses and merging with marshes around the confluence of the Morda and Vyrnwy to its south and the Dee Estuary to the north. In this regard, it is important to differentiate between ‘major’ rivers in terms of the scale of the watercourse and ‘major’ channels in terms of their significance

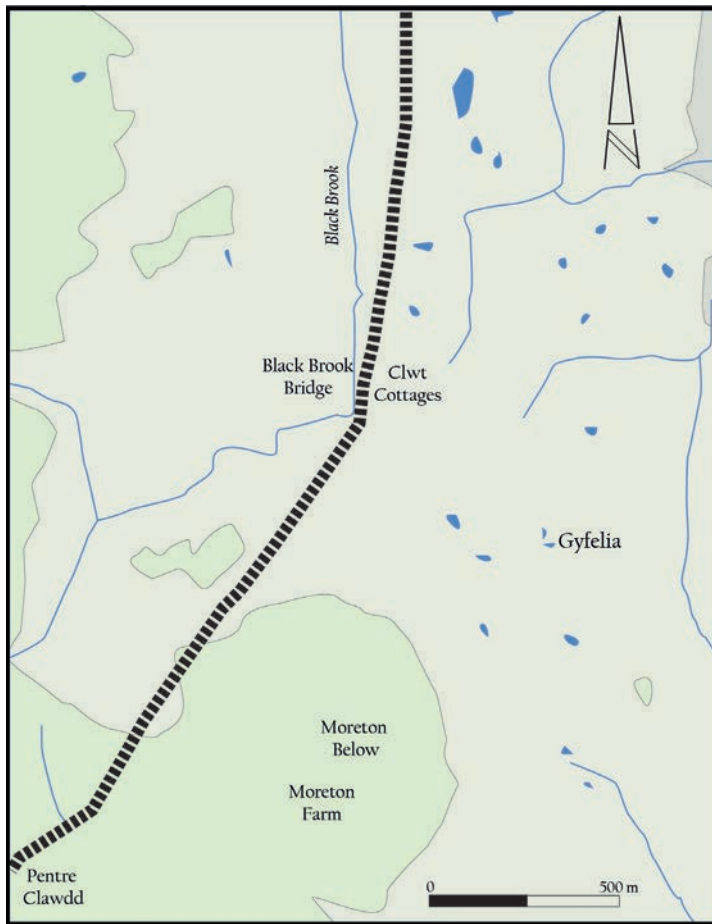


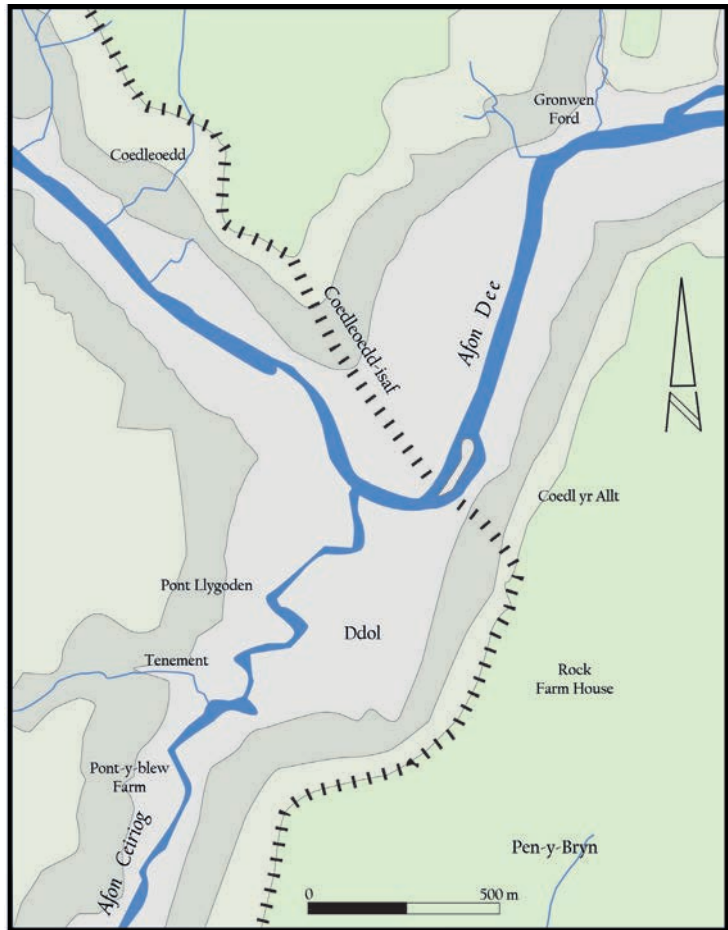
Figure 11: Wat's Dyke at Clwt Cottages, Wrexham, SJ 321 456, to the north set back from, but parallel to, the Black Brook, to the south departing the watercourse and running upslope to Pentre Clawdd (for key, see Figure 3)

as likely routes of movement through the landscape: I refer to the latter as crucial in landscape terms. With this distinction in mind, I would identify five critical locations where Wat's Dyke's course blocked major watercourses. From north to south these are:

- Groes-Onen windmill, Holywell overlooking the Bagillt stream (Figure 4; Fox 1955: 229);
- The confluence of the Afon Nant-y-Fflint and Afon Conwy to form the Swinchiard Brook (Figure 5; Fox 1955: 230);
- Bryn Alyn hillfort overlooking the River Alyn (Figure 8; Fox 1955: 238);
- The confluence of the Clywedog and Black Brook at Erddig Castle (Figure 10; Fox 1955: 241–242);
- The confluence of the Dee, Ceiriog and Morlas (part-included in Figure 12; Fox 1955: 245–246).

Two of these major blocking locations are asymmetrical in regard to where the Dyke joins the valley from one direction and then follows it in another (Bagillt and Bryn Alyn: for the latter, see also Swallow 2016: 311); in the other three cases there is more symmetry in that

Figure 12: Wat’s Dyke’s postulated course at the confluence of the Dee and Clwyddog, c. SJ 319 394 (for key, see Figure 3)



the Dyke follows each waterway before crossing at or just below their confluence. Sadly, in each case, details of the course of the Dyke can only be postulated rather than fully charted on the ground: in the valleys themselves traces of the Dyke will have been long washed away by centuries of colluvial and fluvial action. Still, each location relates to a shift in the orientation of the river or stream course and in three cases, to confluences of significant watercourses. For Bryn Alyn, the prehistoric promontory fort may well have been not only utilised in the line of Wat’s Dyke, but served as a strategic lookout point and assembly/mustering place (see Swallow 2016: 310–311). In these locations, Wat’s Dyke traverses the high ground upon one or both sides of the valleys in order to dominate traffic both along and across its line. For the confluence of the Afon Nant-y-Fflint and Afon Conwy, it seems that Wat’s Dyke performs an ‘angle-turn’ (Ray and Bapty 2016: 234–240) and heads north-east before dropping down to block the Swinchiard Brook (although we cannot trace the detail of its line here) (see also Swallow 2016: 310).

At Court Wood north of its crossing to Erddig, Wat’s Dyke follows the top of the scarp overlooking the Clywedog before blocking its confluence with the Black Brook (Figure 10). Indeed, this can be seen as part of a more complex set of micro-stances adopted by

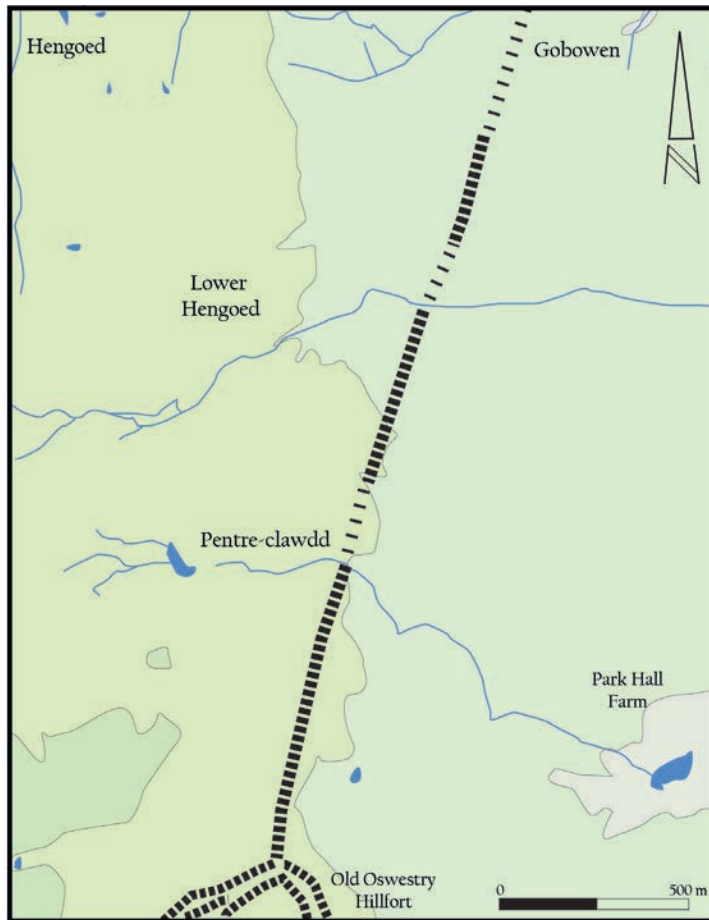
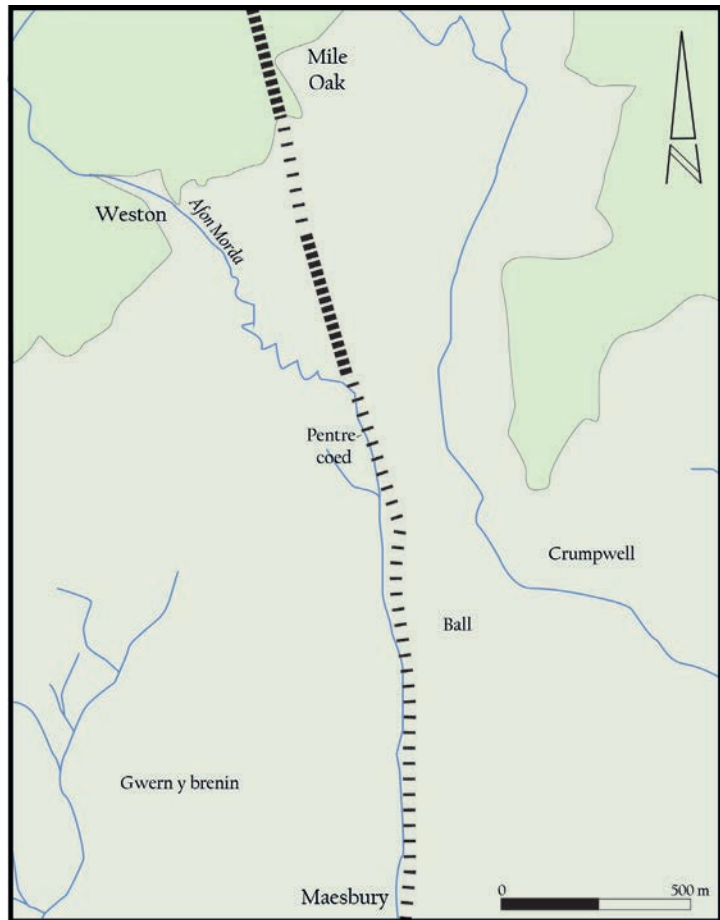


Figure 13: Wat's Dyke between Gobowen and Old Oswestry Hillfort at Pentre-clawdd Farm, SJ 298 320 (for key, see Figure 3)

Wat's Dyke to dominate not only the confluence of the Black Brook and the Clywedog, but also the confluence of the Glanyrafon Brook and Black Brook to the south at The Rookery (Figure 10). Clearly this relationship with the two confluences is significant since, to the south, Wat's Dyke behaves in a contrasting fashion, adopting a relatively straight alignment set back from the Black Brook as far as Clwt Cottages. Meanwhile, for the largest watercourses and confluences, the Morlas, Ceiriog and Dee, it is postulated that the Dyke followed the tops of the valley slopes facing west over the valleys of all three watercourses in succession (Figure 12; see Worthington Hill 2019: 66–68). In each instance, Wat's Dyke shifts its alignment to enhance its visual and physical domination of the confluences and watercourses, again controlling both movement biaxially: along and across its line.

One can imagine such situations as possible locations of complex installations to observe and control people and livestock traversing the valleys and wishing to cross the frontier at gateways, although inevitably no archaeological evidence remains of such features (cf. Ray and Bapty 2016: 244–250). The possibility that Bryn Alyn hillfort ramparts might be reused in this regard is a hypothesis worthy of further consideration, countering Fox's

Figure 14: Wat’s Dyke between Mile Oak and Maesbury at Pentre-coed, SJ 303 269 (for key, see Figure 3)



assertion that associations with prehistoric fortifications were merely coincidence. By the same token, Swallow (2016: 308, 310) has argued for a longer-term strategic role for the Nant-y-Fflint–Conwy confluence and the Glanyrafon–Black Brook/Black Brook–Clywedog confluences.

But what of smaller watercourses? Ray and Bapty (2016: 136–137) postulate that Offa’s Dyke tackled these with barely a deviation in its path. Yet, for Wat’s Dyke at least, there is striking evidence to counter this argument: the earthwork carefully adjusts its approach to even the smallest of streams. This is demonstrable at the Northop Brook between Mynachlog and Soughton Farm (Figure 6) and in the series of small streams that form the Black Brook and then join the Alyn at Padeswood (Figure 7). In the former case a perpendicular crossing of the stream is achieved that would have been compromised had the Dyke run further south-west. In the latter, the line of Wat’s Dyke is carefully aligned so as to minimise the number of valley-side streams it must negotiate. The long-distance alignment of Wat’s Dyke to cross the Gwenfro is a further example (Figure 9). The smaller streams at Gobowen, Lower Hengoed and Pentre-clawdd north of Old Oswestry hillfort further illustrate this stance: in each case had the Dyke been aligned

eastwards or westwards of its chosen course, its perpendicular crossing of the stream would have been compromised (Figure 13).

The careful long-distance adjustment of orientation at Clwt Cottages is an interesting instance that does not block a watercourse at all, but relates to these other strategies of careful interaction with streams and rivers. Namely, Wat's Dyke shifts its alignment at a very precise point here, facing off against the Black Brook's own shift in orientation at a small natural tump which, as with more dramatic locations, might have retained significance as a watch tower or fort (Figure 11). This low-lying and subtle use of topography complements the other instances and shows the overall care and attention to topography, and specifically to the location of watercourses.

Despite this similarity in overall placement to Offa's Dyke, the contrast between the two monuments north of the Vyrnwy is striking in terms of the number of watercourses blocked by each monument. Offa's Dyke crosses 12 streams and two rivers (the Dee and the Ceiriog), meaning that on average Offa's Dyke cuts across a watercourse every 2.6km where it survives in this northern set of alignments. In contrast, while Wat's Dyke cuts across large and small watercourses as outlined above, and a similar number of 10, this averages only one every 5.5km (Figure 1). Thus, Wat's Dyke not only works far more efficiently to follow river valleys and thus utilise watercourses and valley slopes as integral parts of its design, far fewer watercourses are crossed by the monument. These confluences and crossings were likely the principle bottlenecks for traffic, and thus their control was strategic in military, political and socio-economic terms, from grazing livestock (cf. Halkon 2013: 57) to visually staging oversight for surveillance, tactical advantage and intimidatory control (Moore 2012; Ray and Baptý 2016: 139–142).

The key finding is that Wat's Dyke crosses fewer watercourses, and asserts greater control over them, than Offa's Dyke achieves in this landscape. Having explored the localised hydraulics of Wat's Dyke along its course, we need to now shift the scale of our discussion to address Wat's Dyke's broader fluvial interactions.

Wat's Dyke from 'sea to sea'

The maritime links of Wat's Dyke have been repeatedly overlooked. Fox certainly noted the importance of Wat's Dyke in linking the southern shore of the Dee estuary to the Middle Severn via the marshes around the course of the Morda and Vyrnwy which served as natural boundaries, thus dividing the English Midlands from the hill country of North Wales (Fox 1955: 227, 261, 271). Fox regarded these natural defences as protecting 'the flanks' of the monument, but I would contend they are integral, rather than ancillary, to its function and significance as part of a hydraulic frontier zone (Figure 15). Specifically, Wat's Dyke impeded transverse movement but also connected and controlled lateral movement along and behind its line between the watersheds of the Severn and the Dee (cf. Bell 2012; Ray and Baptý 2016: 241–242; Grigg 2018; see also Halkon 2013: 54; Ladd and Mortimer 2017; Fiocoprile 2021).

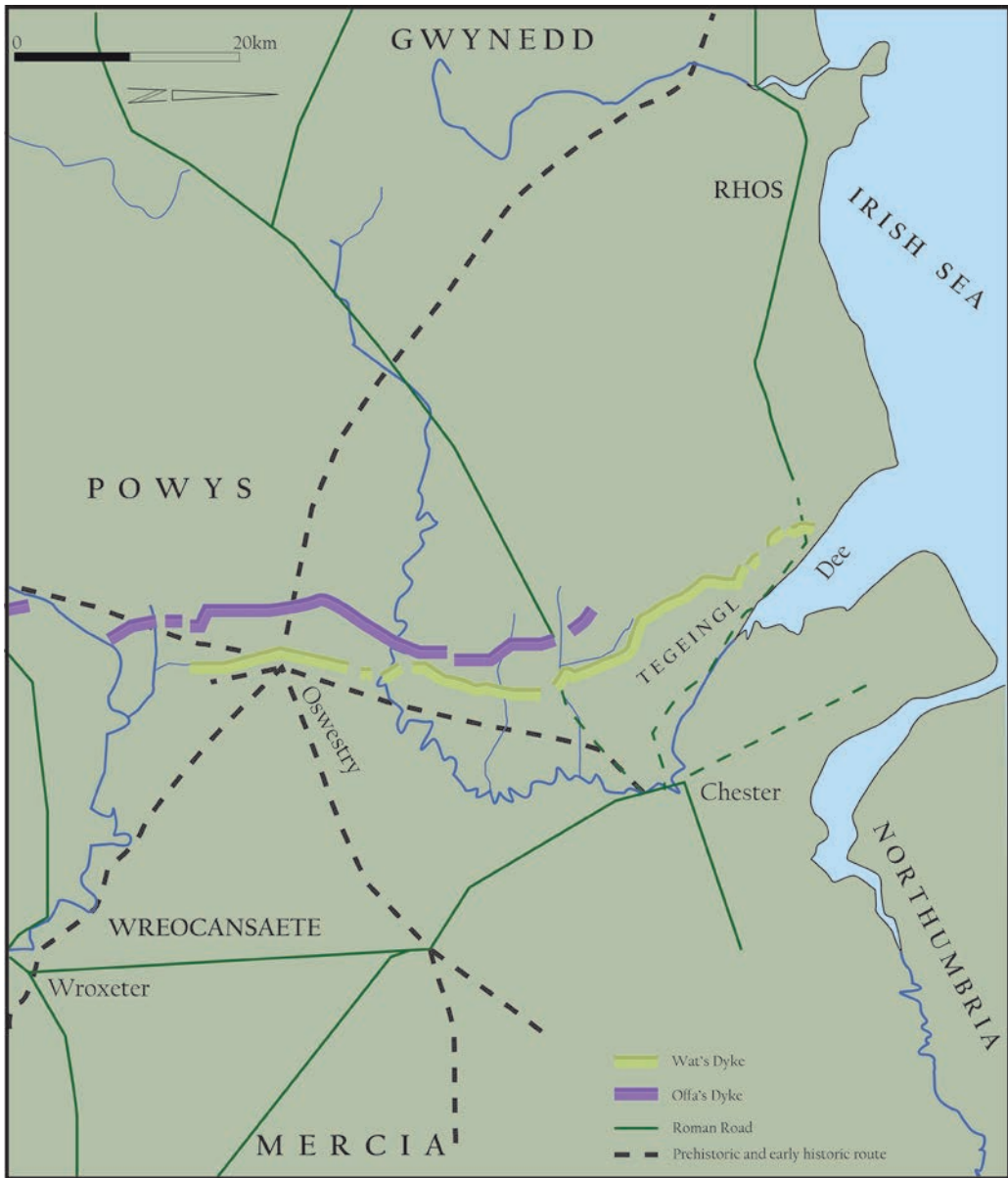


Figure 15: Wat's Dyke mapped alongside Offa's Dyke in a regional context, with Roman roads (adapted after Malim 2007, figure 18; Malim 2020a) and possible prehistoric and early historic routes (after Malim 2020c)

At Basingwerk, Wat's Dyke might have not only run down to the Dee Estuary but projected out into it, thus providing a mole or jetty to shelter and moor seafaring vessels as well as preventing unobserved circumvention of the frontier work within the tidal zone. Wat's Dyke can thus be postulated as a transshipment point for traded goods and travellers of all sorts, as well as a base for patrolling the Dee Estuary against seaborne raiders. While the nature of the 'fortification of the people of Basa' (Basingwerk) is

unclear, the idea that a Mercian elite residence or fortification was situated here at the northern end of Wat's Dyke has long been surmised (Fox 1955: 228–229).

Likewise, at the far southern end of Wat's Dyke, we have already encountered the arguments of Fox (1955: 251–253), later expanded by Worthington Hill (2019: 64), postulating that the monument might have extended south to Newbridge and even further south to Lower Morton as a canal extending through the marshland of the Morda and Vyrnwy confluences. Terminating in this watery environment, Wat's Dyke again not only controlled west–east movement but also facilitated communications and north–south transshipment between the Severn and Dee watersheds. Wharfs and other installations can only be speculated at such key nodes as at Basingwerk and Maesbrook (cf. Sayer 2009).

While the status and character of habitation in Chester before the tenth century remains unclear (Mason 2007: 57–72), both terminuses of Wat's Dyke might have worked in tandem to control traffic along the lower Dee river past the former legionary fortress where a possible Mercian minster church was established prior to the establishment of the burh in the early tenth century. Seen from these riverine perspective, Wat's Dyke was effectively a monument which dominated, blocked but also managed mobilities throughout the region (Figure 16).

Understanding Wat's Dyke's control of 'land flow' (see Edgeworth 2011) is also necessary. Malim (2007: 25) described Wat's Dyke as running 'along the edge of the Midland Plain... in straight sections between survey points connecting strongholds and important known places along the way...'. This very much follows Fox's evaluation, and Malim counted six or seven hillforts or strongpoints in its route (Malim 2020a: 145–146). In terms of communication routes, Malim (2007: 27) believed that prehistoric and Roman routeways would have been maintained with controlled access points through both linear earthworks, one example of which may have been Old Oswestry hillfort (Malim 2020c). He thus reasonably speculated that a network of military controlled routeways were connected to Wat's Dyke, less to keep the 'Welsh out of Mercia, but instead ... to control the Welsh coming into Mercia!' and thus it is as much about taxation of rich mineral resources and other commodities of the region as preventing Welsh raids. What Malim did not consider is the strategic significance of simultaneously guarding north–south routes over watersheds as controlling west–east movement across the line of the dyke. While in a recent study Malim suggested Wat's Dyke might have had an earlier (prehistoric) origin as a boundary, and considers the watercourses as part of the barrier role of the monument, he only briefly discusses ancient routeways in relation to the earthwork and not only in a transverse fashion but also between the Severn and Dee estuaries, with the strongholds as older points of convergence for these routes (Malim 2020a: 154, 156).

Bishop Asser, writing the biography of King Alfred of Wessex, defined Offa's Dyke as running from 'sea to sea'. For Offa's Dyke, debates continue to rage on the accuracy of

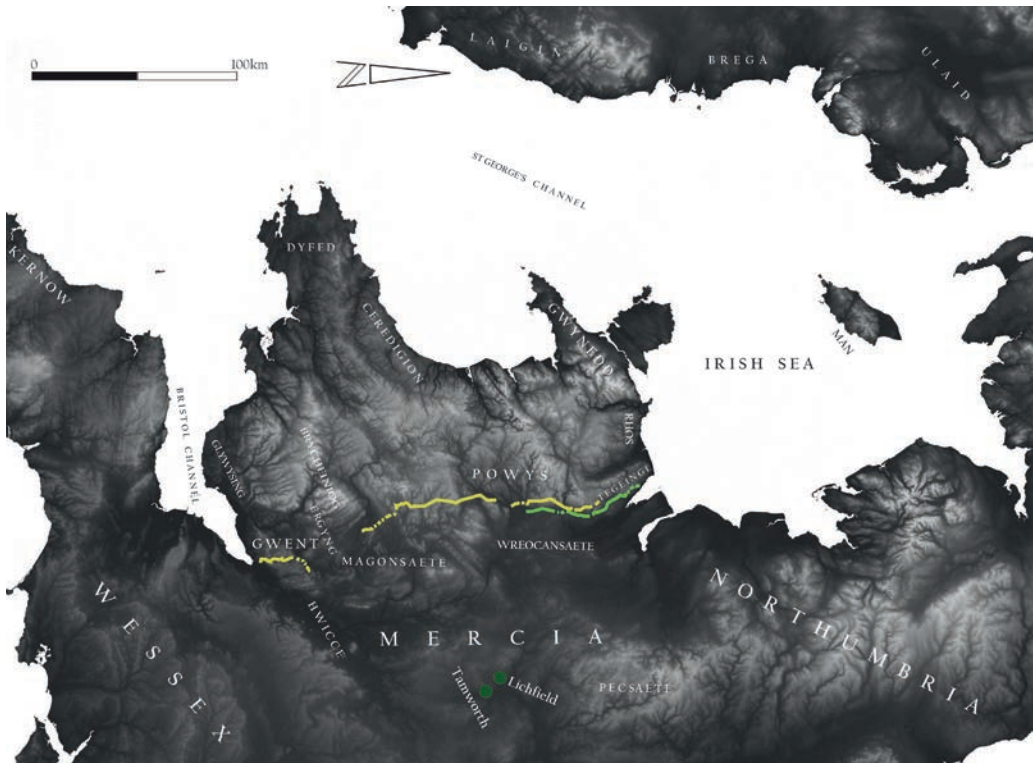


Figure 16: Wat's Dyke (green) and Offa's Dyke (yellow) set in a broader eighth/early ninth-century western British context showing their relationship with the Anglo-Saxon kingdom of Mercia. The map also shows some of Mercia's constituent western territories (Wreocansaete, Magonsaete and Hwicce), perhaps independent kingdoms in their own right to the early seventh century. Mercia's British (including Powys and Gwent) as well as Anglo-Saxon (Northumbria and Wessex) neighbours are represented, as well as a broader Irish Sea and Bristol Channel zone of interaction from Cornwall in the south, eastern Ireland to the west, and Man, Cumbria and south-west Scotland to the north

this statement (see also Ray 2020), yet for Wat's Dyke it was most certainly true in practical and conceptual terms. For while Wat's Dyke most certainly did not run 'from sea to sea' as a bank and ditch, when mapped in relation to Blair's (2007) map of historic watercourses, it becomes clear how they operated in relation to the Irish Sea, the Bristol Channel and movement between the Dee and Severn water catchments, controlling a 'hydraulic frontier' of 'flow' over land and water (see also Oksanen 2019). The entire construction of these monuments appears to be about connecting the sea and 'land flow' between two of the island of Britain's major water catchments: the Dee and the Severn.

David Griffiths (2009; see also Griffiths 2010: 16–20) is one of the rare commentators to look before the Viking Age at the Irish Sea zone and consider its beach markets in relation to more localised, as well as long-distance, maritime networks. Considering Wat's Dyke and Offa's Dyke in relation to these maritime, estuarine and riverine communications

provides a better understanding of the functions and significance of the monuments as to do with asserting and projecting Mercian power and authority, economic and religious influence not only over the Welsh but also in relation to Mercia's two great Anglo-Saxon rivals (Northumbria and Wessex) and their shared western British and Irish neighbours (Figure 16). In other words, Mercia's west-facing linear earthworks were less about relationships between 'England' and 'Wales' in the eighth and early ninth centuries, as between Mercia and the Irish Sea region more broadly (cf. Griffiths 2010: 20; Swallow 2016).

Discussion: linear earthworks and water

Previous work on linear earthworks has often recognised their careful topographical placing, exemplified most recently with Ray and Bapty's (2016) discussion of Offa's Dyke's long-distance stances in relation to major valleys and rivers, and localised strategic placement in relation to hills and valleys. Yet seldom have linear monuments been evaluated in any detail in terms of their relationship to wetlands, watercourses and watersheds. Notably, the distance and complex terrains negotiated by Britain's longest early medieval linear earthworks – Offa's Dyke and Wat's Dyke – has hindered more than cursory attention to their relationships with different wetlands, streams, rivers and estuaries, let alone the postulation of potential design features and placements intended to control and manage water.

With the exception of implausible pseudoarchaeological theory that the entire length of Offa's Dyke and Wat's Dyke were prehistoric canals (critiqued by Fitzpatrick-Matthews 2020), the precise relationship of early medieval linear earthworks with watercourses and water management has received scant attention. One rare exception was Sir Cyril Fox's postulation that the southern end of Wat's Dyke was canalised as far as the River Morda (Fox 1955: 252–253). Later, Squatriti (2004) considered Offa's Dyke's environmental impact, its effect on the 'ecologies and economies' of its surroundings, including impact on the hydrology of smaller streams (Squatriti 2004: 42), enhancing cultivability through increasing run-off and lowering the water table, thus influencing existing land-use and creating new relationships with the land. Large-scale woodland clearance associated with the building of the dykes to ensure the kinds of visibility and surveillance envisaged by both Hill and Worthington (2003: 113–128) and Ray and Bapty (2016: 122–163) might have likewise affected the hydrology. Ray and Bapty go further, specifically suggesting that Offa's Dyke might have deliberately co-opted and re-routed watercourses; in the case of the Casob stream, it might have been realigned by the earthwork where Offa's Dyke crosses the Lugg, operating like a 'low dam' across the valley' (Ray and Bapty 2016: 136). Moreover, it has long been recognised that both Offa's Dyke and Wat's Dyke broadly delineated contrasting ecological zones between uplands and lowlands, intervening with long-term patterns of interconnectivity between them, including transhumance practices and moving upland products to lowland consumers – 'slicing through the symbiotic ties between lowland and upland economies ...' creating a

redefinition of how ‘local resources were allocated in the frontier zone’ (Squatriti 2004: 47; see also Malim 2007). Rivers and streams, marshes and fen, estuaries and the sea, could operate in relation to linear earthworks as zones of exploitation and habitation as well as both lines of communication along their banks and potentially as barriers to impede movement. In this regard, we must understand the effects and affects of linear earthworks also in terms of hydraulic power (mills) and resources (watering livestock, fishing etc.) (see also Sayer 2009).

Yet despite these observations, the precise and detailed relationship between dykes and watercourses has received limited attention. Partly this is because we have so few sections of these linear earthworks preserved in low-lying locations: the relationships with watercourses and wetlands are often lost to us due to over a millennium of fluvial action, not only erosion but the accumulation of colluvium and alluvium. Likewise, hardly any of the modern interventions into these monuments have explored their riparian and other low-lying associations, targeting instead the positions of dykes on higher ground. This is because the best-surviving sections of both Wat’s Dyke and Offa’s Dyke are in upland zones away from watercourses and wetlands, which has seduced archaeologists and the wider public into considering their hydraulic association as ancillary at best (cf. Halkon 2013: 52–59). Indeed, many shorter dykes survive across ridges, bisecting interfluvial spurs and valley-sides and thus seem to be, by nature, disconnected from water (Hankinson and Caseldine 2006). Together, these factors of preservation and later landscape transformation have hindered and discouraged close considerations of the hydraulic dimensions of the monuments. Equally, the very descriptive terms archaeologists use for these monuments prioritises their land-related dimensions, including ‘earthwork’, ‘boundary’ and ‘monument’ even if their end-points seem to relate to significant hydrological junctures, such as wetlands and interfluvials (e.g. Malim 2007). Such terms regard the banks and ditches in and of themselves without consideration of other features connected to them, thus their potential hydraulic dimensions and interactions are eschewed.

Therefore, while scholars vary in their emphasis upon the military, territorial, economic and ideological dimensions to these monuments (Fox 1955; Noble 1983; Hill 2000; Hill and Worthington 2003; Malim and Hayes 2008; Ray and Bapty 2016; Belford 2017; Grigg 2018), the modes of interaction are primarily seen as pertaining to land. Discussions thus focus on linear earthworks in terms of movement on foot or horseback, droving animals and moving goods and materials. Thus, linear earthworks are regarded as blocking, directing, controlling and surveilling *land*, with water either completely ignored or seen as incidental to land-related functions and significances. Hence, while almost all commentators have recognised the dykes as blocking and controlling watercourses as well as land routes (e.g. Hill and Worthington 2003; Malim 2007; Ray and Bapty 2016) there has been no systematic research focus upon *how* the dykes respond to water let alone their potential constructions, adaptations and transformations of watercourses. Notably, only four of the valuable and informed one hundred research questions posed

by Keith Ray building on the Ray and Bapty (2016) survey of Offa's Dyke explore the relationship of these monuments to water (nos 15, 16, 17 and 74) (Ray 2017):

15. How did the Dyke approach, and relate to, the major rivers it encountered (Ray and Bapty 2016: 126–131)?

16. Why does the Dyke approach more minor river-valleys in the various ways that it does – are there any clear recurrences in such approaches (Ray and Bapty 2016: 135–142)?

17. How did the Dyke negotiate immediate crossings of minor rivers (rather than the relevant whole valleys), physically (Ray and Bapty 2016: 135–137)?

74. Are there any other 'landscape features' related to the Dyke and contemporary with it, such as road systems, river-ports, trading places, markets, defended positions, settlements, and field boundaries (Ray and Bapty 2016: 226–34; 240–51)?

These legitimate and precise questions provide the immediate inspiration for this work, building on key observations regarding the interaction of the dykes with water made by Fox (1955), Noble (1983), Hill and Worthington (2003) and Ray and Bapty (2016). Yet these observations have only been posed for Offa's Dyke and, in contrast, Wat's Dyke's hydraulics have been largely ignored (but see Fox 1955; Malim and Hayes 2008). Many, like Squatriti (2004: 49) note how the dykes truncate ancient highways, but as recently as Murrieta-Flores and Williams (2017) detailed evaluation of the role of the dykes in relation to movement through the landscape, they were primarily focusing on movement over land. The significance of watercourses as conduits and barriers to movement, let alone their intersections and relationships with the dykes, are given limited attention, as are their other potential economic and industrial, territorial and military functions and significances. The potential extension of the management of these topographies with mills and bridges (see also Ray *et al.* 2021), watchtowers and beacons, as well as their exploitation for fishing and watering livestock, must remain speculative at present (but not fanciful) components for how these linear earthworks operated to intercept and direct mobility and resource exploitation beyond an exclusively military functionality.

This neglect of linear earthworks' watery interactions stands in contrast to the increasing body of research showing the centrality of hydraulic economies to middle Anglo-Saxon ecclesiastical landscapes and thegnly estates, and also to military communications and trading networks (Blair 2007). These extend from discussions of coastal and riverine landscapes to fenland, but such perspectives also affect upland landscapes. It also stands in contrast to the clear linkages evident between frontiers and river systems on the Continent (e.g. Hardt 2005) and biaxial relationships between north–south land routes and west–east estuarine and river dimensions in the complex history of the Danevirke: positioned to control north-south land routes along the Jutlandic peninsula, but also, at

least by the Viking Age, controlling significant trading routes between the North Sea and the Baltic (Dobat 2008; Tummuscheit and Witte 2019). Indeed, Continental evidence for canal-building as an element of communications and royal works is evidenced for AD 793 in Charlemagne’s failed canal-building project aimed at linking tributaries of the Danube and the Rhine (Blair 2007: 2; Squatriti 2002; Werther *et al.* 2020). Also, there is the Kanhave canal, now securely dated to the early eighth century, showing how canal-building was a feature of maritime communications (Crumlin-Pedersen 2010: 141; see also Bates *et al.* 2020). As a backdrop, the barriers used to control channels in fjords, whilst presenting no clear British parallel, do indicate the possibility that dykes might have been connected to a host of installations to control and oversee movement on and across water (Crumlin-Pedersen 2010: 125–143).

For Britain, the relationship of the Cambridgeshire Dykes with wetlands is well established, serving to block movement on dry land across their lines, but also facilitating/directing movement between upland grazing and the fens (Ladd and Mortimer 2017; Malim 2020b; see also Moore 2012; 2017; Fiocoprile 2021). Together with a growing awareness of the importance of studying mobility via overland movement in the Early Middle Ages (Langlands 2019) and more broadly over time (Bell and Leary 2020), a consideration of land *flow* as well as fluvial and other watery interactions provides new insights into how early medieval linear earthworks operated.

Conclusion

Wat’s Dyke was part of a hydraulic frontier zone, revealed by its localised interactions with ‘land flow’ as well as its placement in relation to water. In both regards, this conceptualisation of Mercia’s western frontier applies to the Dee Estuary, wetlands, rivers and streams as well as its broader role in traversing and controlling the Welsh ‘isthmus’ between the Dee and Severn water catchments, and thus seaborne trade and communications out to the Bristol Channel and the Irish Sea. It is applicable also to Offa’s Dyke.

For Wat’s Dyke, the earthwork was both a zone of interaction and a link between places (Fiocoprile 2021: 89). It orchestrated the biaxial flow of people, animals and things on multiple scales: local, middle-range and long-distance, both across and along this line. Wat’s Dyke thus served the political and economic aspirations of the early medieval kingdom of Mercia to project and consolidate its authority and influence not only against and over Welsh rivals, but also to curtail and control relations throughout western Britain and Ireland, as well as with the rival Anglo-Saxon kingdoms of Northumbria and Wessex. I contend that while its date and relationship with Offa’s Dyke remain open to debate, approaching Wat’s Dyke in terms of *flow*, enriches our understanding of its functions and significance as a frontier work and its landscape context.

Wat’s Dyke may have enshrined longer-term patterns of landscape utilisation (see Murrieta-Flores and Williams 2017; Malim 2020a) and subsequently influence the

political and cultural geography of the Anglo-Welsh borderlands down to the Norman Conquest and beyond (Swallow 2016; Worthington Hill 2019). Moreover, by constituting and perpetuating a hydraulic frontier zone for western Mercia, Wat's Dyke specifically foreshadowed the burgeoning evidence for trade and exchange throughout the Irish Sea and served as a monumental precursor to West Saxon expansion and burh-building within the West Midlands and North West in the tenth and early eleventh centuries (Griffiths 2010). Mercia's western frontiers in the eighth and early ninth centuries were, therefore, not only concerned with military control and territorial claims. Linear earthworks (Wat's Dyke and perhaps also Offa's Dyke: Ray and Bapty 2016) projected Mercia's military, economic, political and ideological control, influence and prestige so they might *flow* over a far broader geographical expanse via both land and water routes.

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what's wat's Dyke?



A Comic Heritage Trail for **Wat's Dyke in Wrexham**

Howard Williams and John G. Swogger

What's Wat's Dyke?

Wrexham Comic Heritage Trail

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Welcome to the What's Wat's Dyke? Wrexham Comic Heritage Trail!

We hope this comic heritage trail for Wrexham helps introduce you to Britain's third-longest ancient monument.

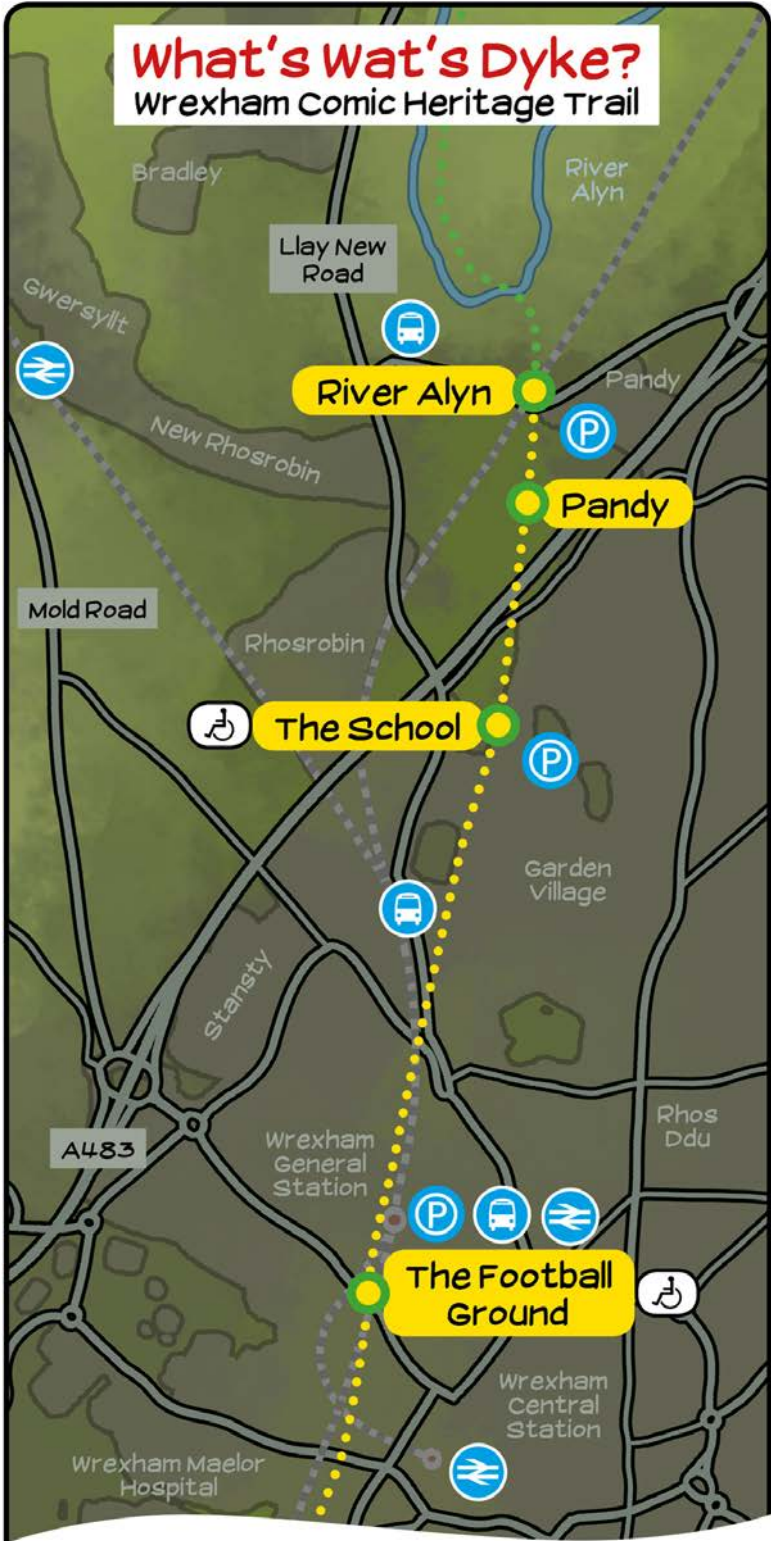
Wat's Dyke was built in the early medieval period (most likely between the late 7th and early 9th centuries AD). Today, it is a fragmentary bank and ditch surviving in varied states of preservation. When newly built, it was most likely designed as a continuous construction by the Anglo-Saxon kingdom of Mercia to dominate and control its western frontier with Welsh rivals. It runs over c. 64km from Basingwerk (Flintshire) to Maesbury (Shropshire).

The map on the next two pages shows you where can visit the monument today, and the comic panels tell the story of Wat's Dyke at each location.

And if you'd like to know even more about Wat's Dyke and other similar monuments, there are suggestions for further reading as well as online links to recent research at the end of this booklet.

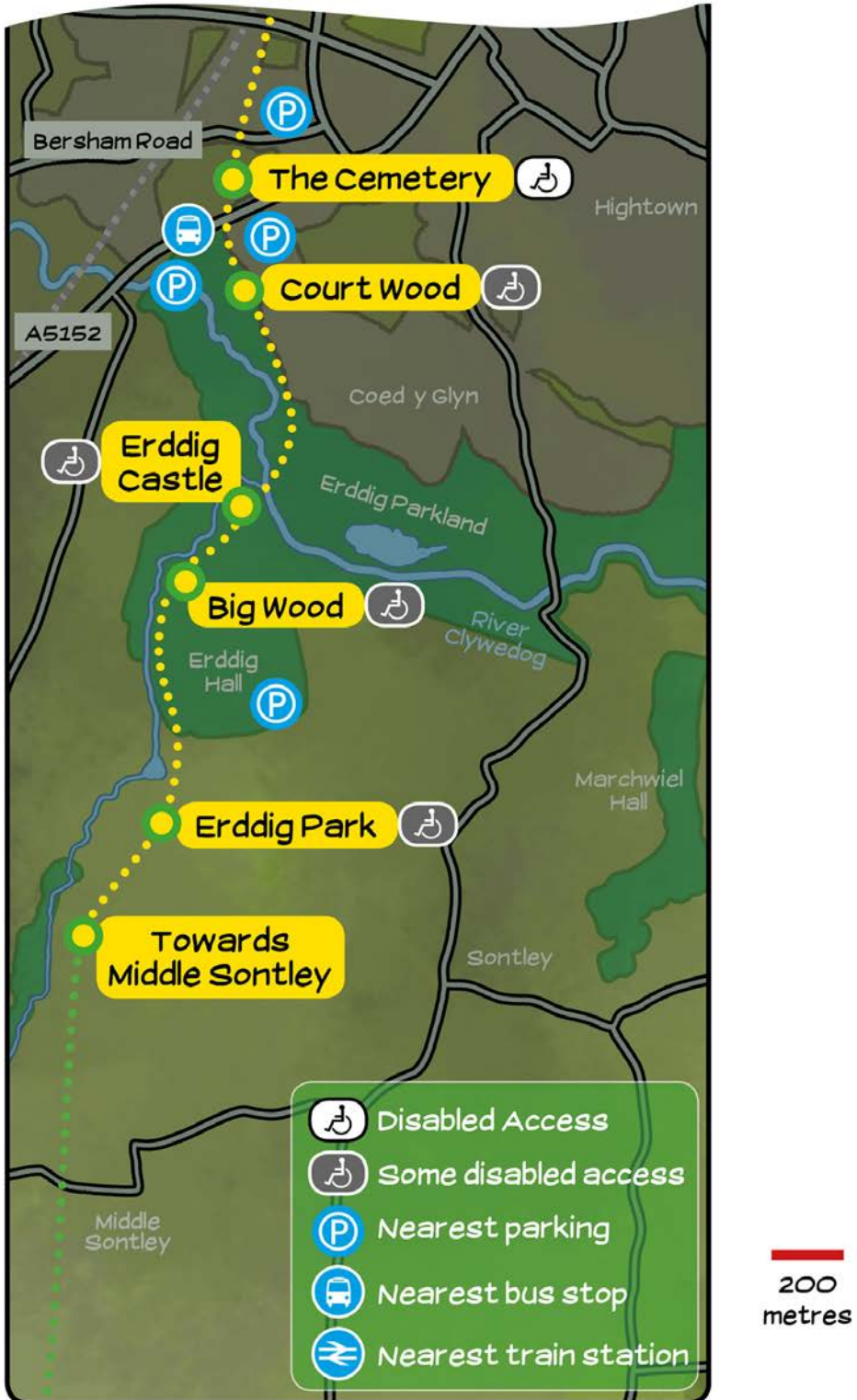
HOWARD WILLIAMS





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Can you imagine standing at the junction of Plas Acton Road and Blue Bell Lane in Pandy north of Wrexham when Wat's Dyke was newly built by the Mercian kings, over 1,200 years ago during the Early Middle Ages?

Britain's third-longest ancient monument, Wat's Dyke commanded the western slopes and scarps of the River Alyn for about twelve kilometres south from Mynydd Isa to augment the already ancient ramparts of Bryn Alyn Iron Age hillfort.

At Bryn Alyn, Wat's Dyke reused the west-facing defences of the hillfort, which had been built at least 1,000 years earlier. The interior of the hillfort was reoccupied either as a fort or a seasonal assembly place. The reuse of the hillfort meant that the loop of the River Alyn around a strategic peninsula was well-guarded.

The Dyke then dropped down from the hillfort following the river cliff. The Alyn itself may have been blocked with chains. The line of the Dyke is lost as it once climbed the steep, now-wooded slopes through Wilderness Wood to where you now stand.

Excavation would help us further understand precisely what the monument looked like, where it went and why.

In this image we give an impression of the newly dug ditch, the bank topped with a palisade. Wat's Dyke is shown garrisoned by Mercian warriors and supported by beacons and watch towers. Was it guarded seasonally or all year round? Was it short-lived or fortified over many decades? Archaeologists are still unsure...

Access

On foot: via Blue Bell Lane. West over the railway bridge, you can walk down a footpath opposite Plas Acton Cemetery to the River Alyn although no traces of Wat's Dyke survive here. There is no bicycle or mobility scooter access down this footpath. Bryn Alyn hillfort is situated on private land.



Wat's Dyke rubs shoulders with Wrexham's industrial heritage at Pandy close to the former Gresford Colliery.

The Dyke is lost where destroyed by the Wrexham-Chester railway line at the junction of Plas Acton Road and Blue Bell Lane. Yet, we encounter it surviving in the fields to the south where the public footpath forms part of the long-distance walking trail: the Wat's Dyke Way. To the south, it has been destroyed by the building of the A483 and Ty Gwyn Lane.

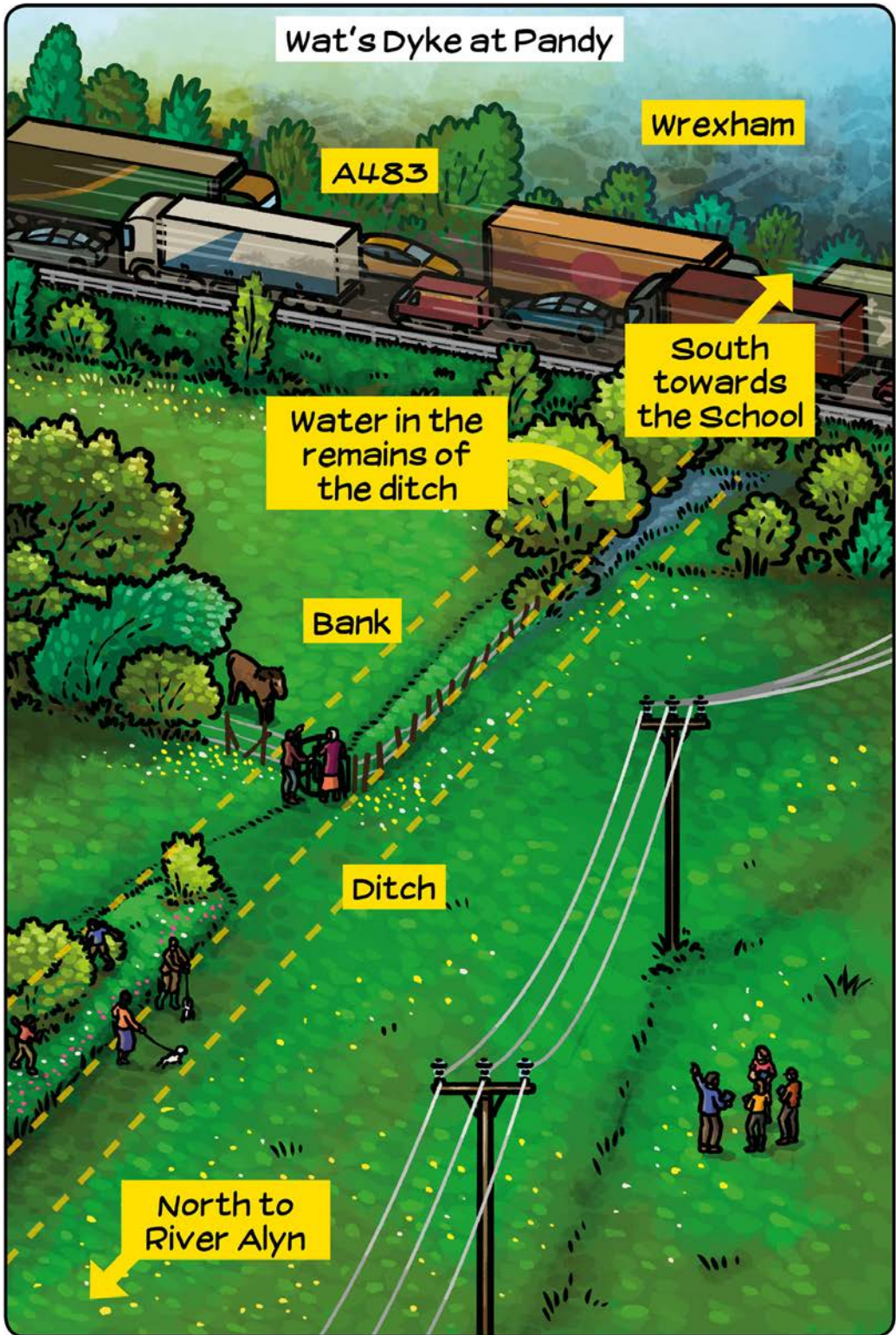
Local people are shown walking their dogs along Wat's Dyke here, but do they spot the traces of the early medieval linear earthwork?

In many places around Wrexham, Wat's Dyke has been damaged or destroyed by later roads, buildings and construction. Sometimes only the bank survives, sometimes the ditch, sometimes neither. Despite this damage, archaeologists refer to Wat's Dyke as a 'linear earthwork' because originally the bank was made of packed earth and stones, and it ran in a long, continuous line.

Access

On foot: via Blue Bell Lane and footpath. No bicycles or mobility scooter access.

By car: parking on Blue Bell Lane, 500m walk on grass.



People live and learn on Wat's Dyke!

Wat's Dyke was incorporated into Wrexham's northern suburbs when Garden Village was built in the 1930s. You can follow it in the fence lines of the gardens south of Ty Gwyn Lane and west of Wats Dyke Way. At the top of the hill it separates the Garden Village Playing Field from Wat's Dyke Primary School.

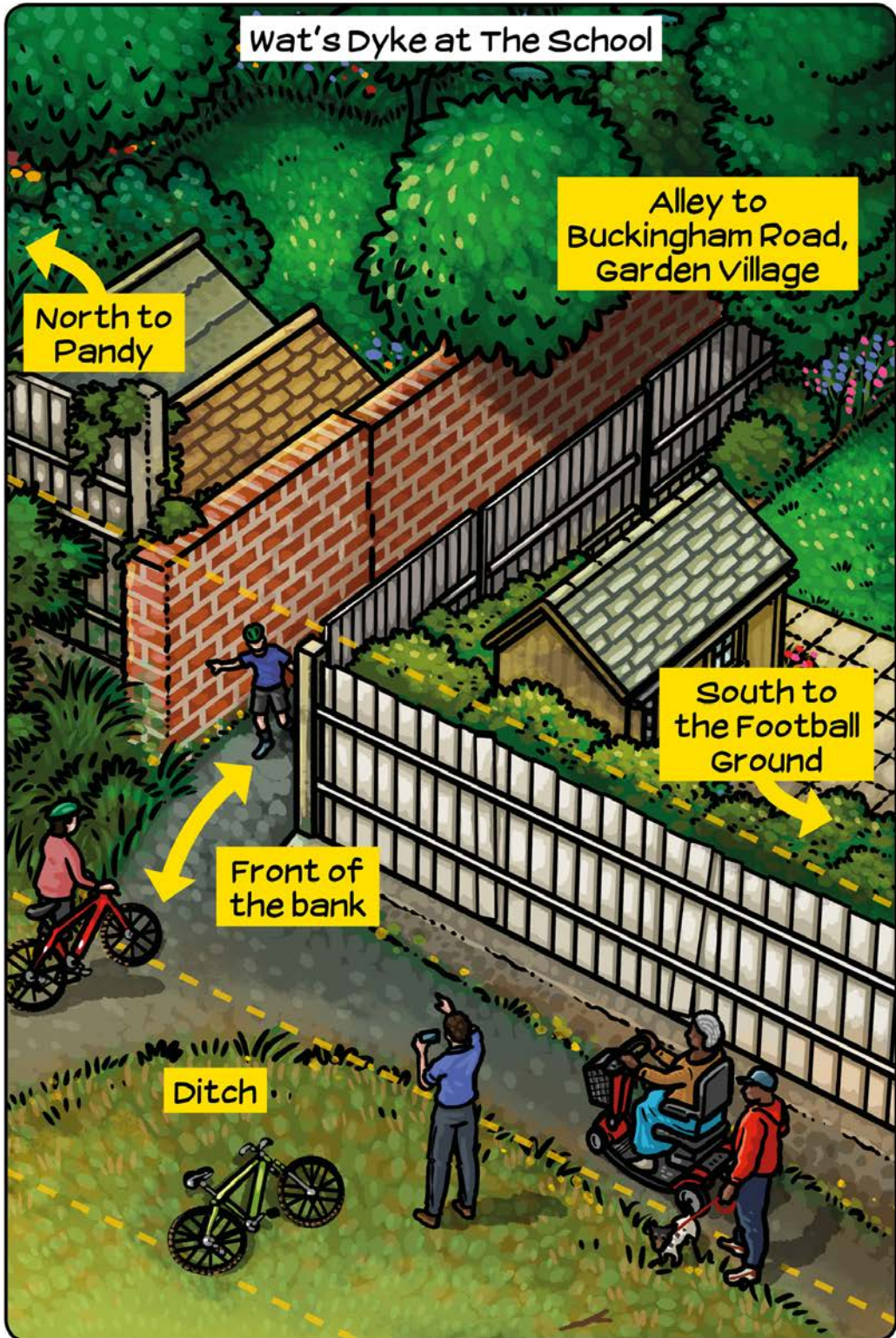
Heading downhill, the dyke then survives under property boundaries at the back of Buckingham Road before being lost beneath houses closer to Wrexham town. Here we see the bank of the Dyke surviving in the slope from an alley running from Buckingham Road.

These boundaries remind us that Wat's Dyke was likely originally part of the frontier between early medieval Welsh kingdoms to the west and the territories of the Kingdom of Mercia to the east.

Access

On foot: by bicycle or mobility scooter via alley from Buckingham Road.

By car: parking on Buckingham Road, 100m walk on paved surface.



People attend lectures, play tennis, watch football and catch their trains beside Wat's Dyke in central Wrexham!

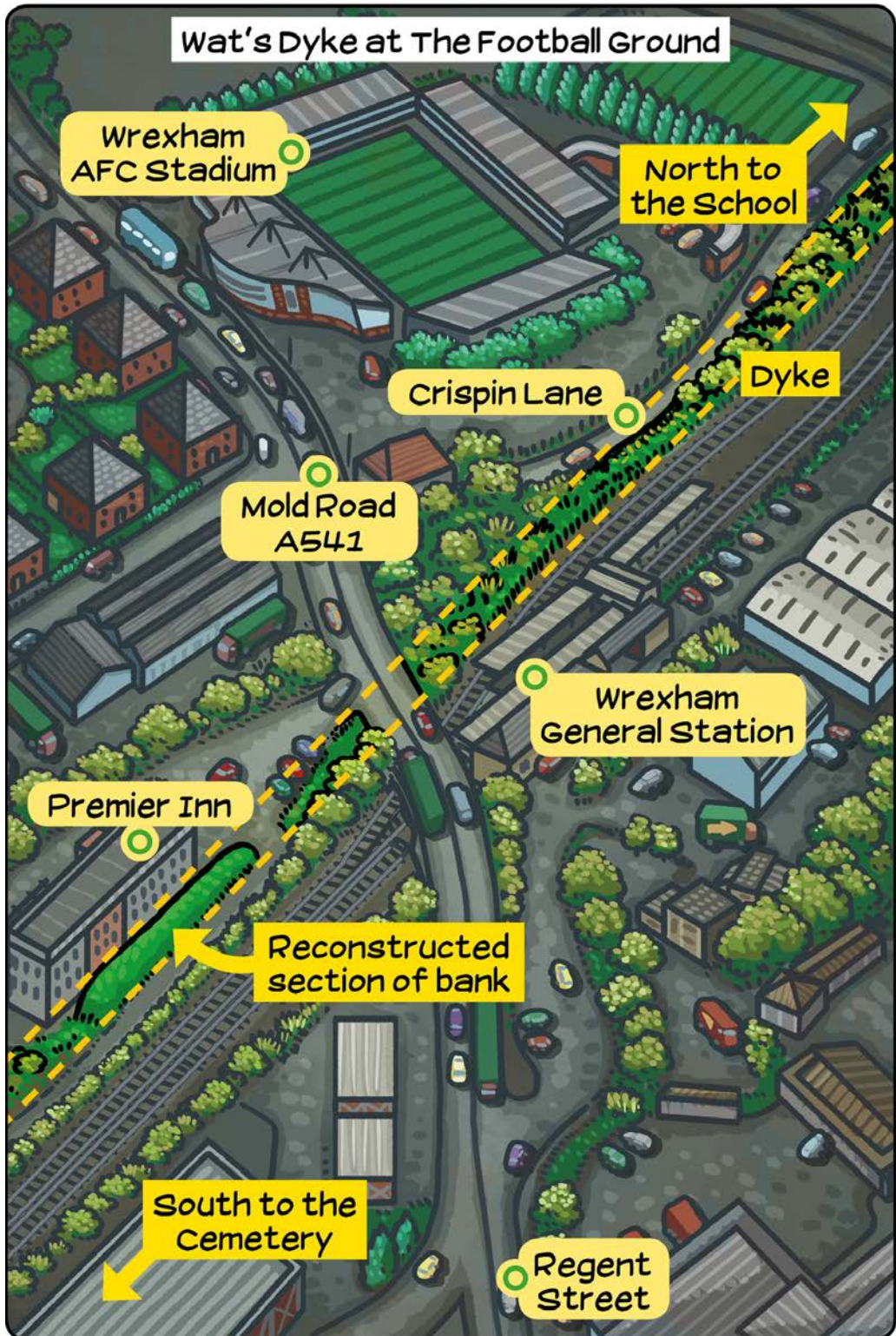
You can see the dyke close to Glyndŵr University campus, Wrexham Tennis Centre and Wrexham Racecourse Ground, home to Wrexham A.F.C. There are also some badly damaged sections of Wat's Dyke surviving between the railway lines and Crispin Lane. Archaeologists are always searching for other surviving sections of the dyke that may still be hidden.

While the ancient dyke has been largely destroyed at Wrexham General railway station, a reconstructed section can also be seen between the railway line and the Premier Inn Hotel on Jacques Way. Reconstructing ancient monuments like Wat's Dyke can be a good way for archaeologists to figure out what construction methods were used to build them, and how much effort and time building it would have taken.

Access

On foot, by bicycle and mobility scooter: Along pavements between Crispin Lane, Wrexham General and Jacques Way.

By car: various car parks and on-road parking.



Wrexham people shop, go to college, grow vegetables and even bury and commemorate their dead along Wat's Dyke!

The Dyke runs south from Morrisons supermarket between allotments and houses to the east and Coleg Cambria to the west. It then served as the original western boundary of Wrexham Cemetery, opened in 1876.

Today, Wat's Dyke can still be seen running through the middle of the burial ground, the ditch marked by a path, and a striking array of late Victorian tombs on top of the bank. The Dyke provided a suitable landscape feature in a Victorian garden cemetery.

Two cemetery paths cross the dyke and its course is today marked with bilingual markers. Archaeologists and historians are interested in the different ways the dyke is remembered in different places. Why is it marked here on the cemetery sign and on the paths, but not where Wat's Dyke runs past Morrisons or next to the allotments?

Access

On foot and mobility scooter: enter via Bersham Road or Ruabon Road gates. Bicycles must be walked through the cemetery, not ridden.

By car: on-road parking at Bersham Road entrance, 500m walk on paved surface; limited parking at Ruabon Road entrance, 50m walk.



In Court Wood, part of the National Trust's Erddig Park, you can walk along Wat's Dyke where it joins and follows the top of the scarp above the Clywedog Valley. Fence lines of private houses are on top of the bank, but the ditch and front of the bank remains to be seen along two stretches.

Now eroded away, Wat's Dyke originally dropped down to cross the valley floor at the confluence of the Clywedog and the Black Brook before rising up steep slopes again at Erddig Castle. Just as at the Alyn River below Bryn Alyn hillfort (panel 1), here the Dyke would have blocked passage and visually dominated the Clywedog valley.

The river's steep natural scarp together with the bank-and-ditch (perhaps supported by watch towers, beacons and controlled gates) provided a complex frontier work. The Dyke curtailed and controlled the movement of people with their animals and goods; farmers and traders could be protected and directed to pay tolls during peacetime, just as raiders could be observed and intercepted in times of war.

Here, a Mercian thegn on horseback and his warriors intercept farmers bringing their cattle to market.

Access

On foot: 300-700m walk on steep narrow footpaths around the Erddig parkland clearly marked and accessible from both Wrexham and Erddig Hall. No bicycle or mobility scooter access.

By car: park in the layby of the A5152 opposite Wrexham Cemetery, or else use the National Trust car parks at Felin Puleston Outdoor Centre or Erddig National Trust main car park.



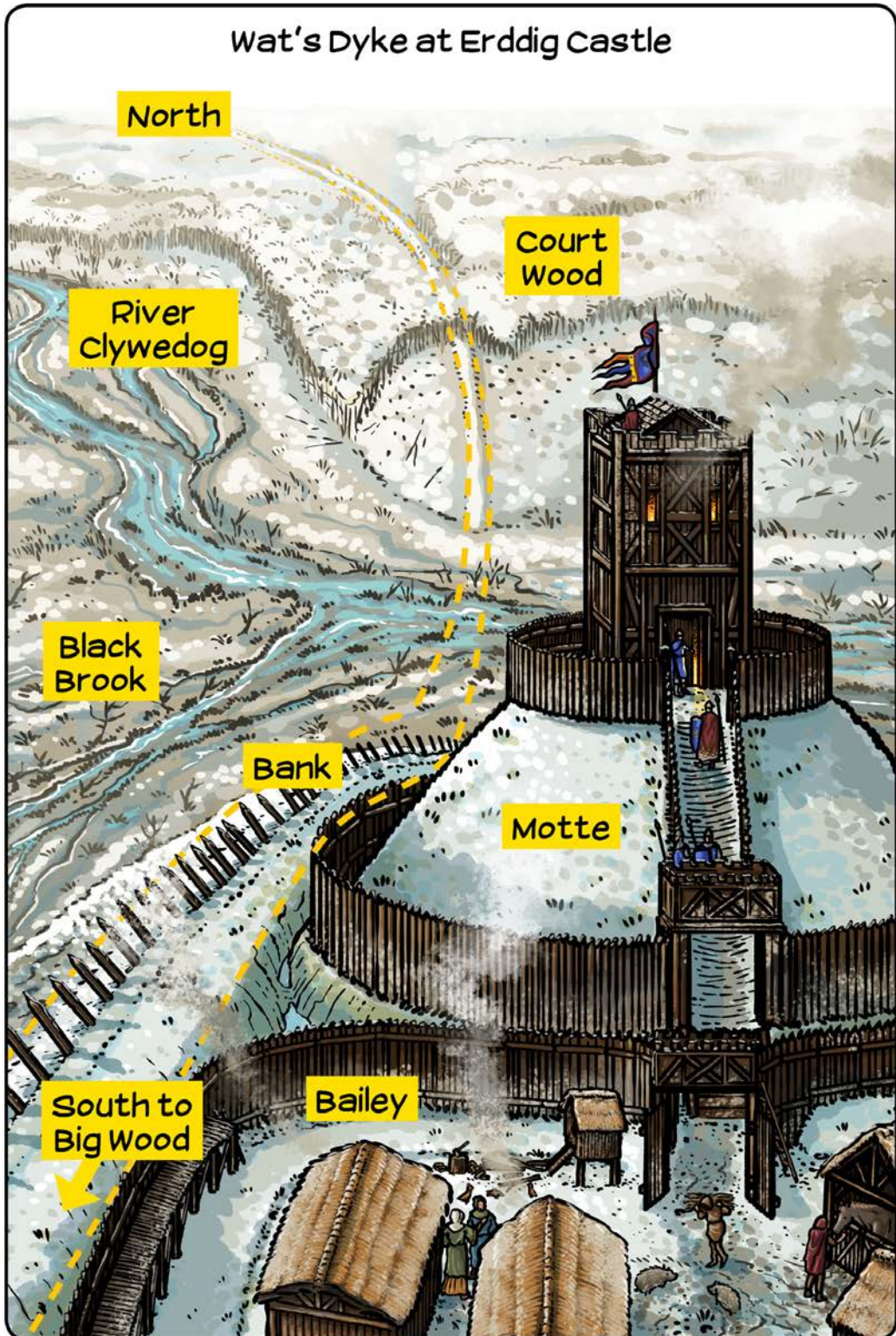
Wat's Dyke crossed the Clywedog at its confluence with the Black Brook. This strategic location endured, and the promontory south of the valley overlooking both brook and river was selected as the site of an Anglo-Norman castle in the late 11th century, possibly built by Hugh de Avranches, earl of Chester.

Despite being constructions for contrasting times and built centuries apart, both Wat's Dyke and Erddig Castle made use of the topography to control and dominate the Anglo-Welsh borderland. Are they both stages in the colonisation of the landscape: first by the Mercians, later by the Normans?

Access

On foot: 750m+ walk from Erddig Hall. No bicycle and partial mobility scooter access.

By car: park at Erddig National Trust main car park.



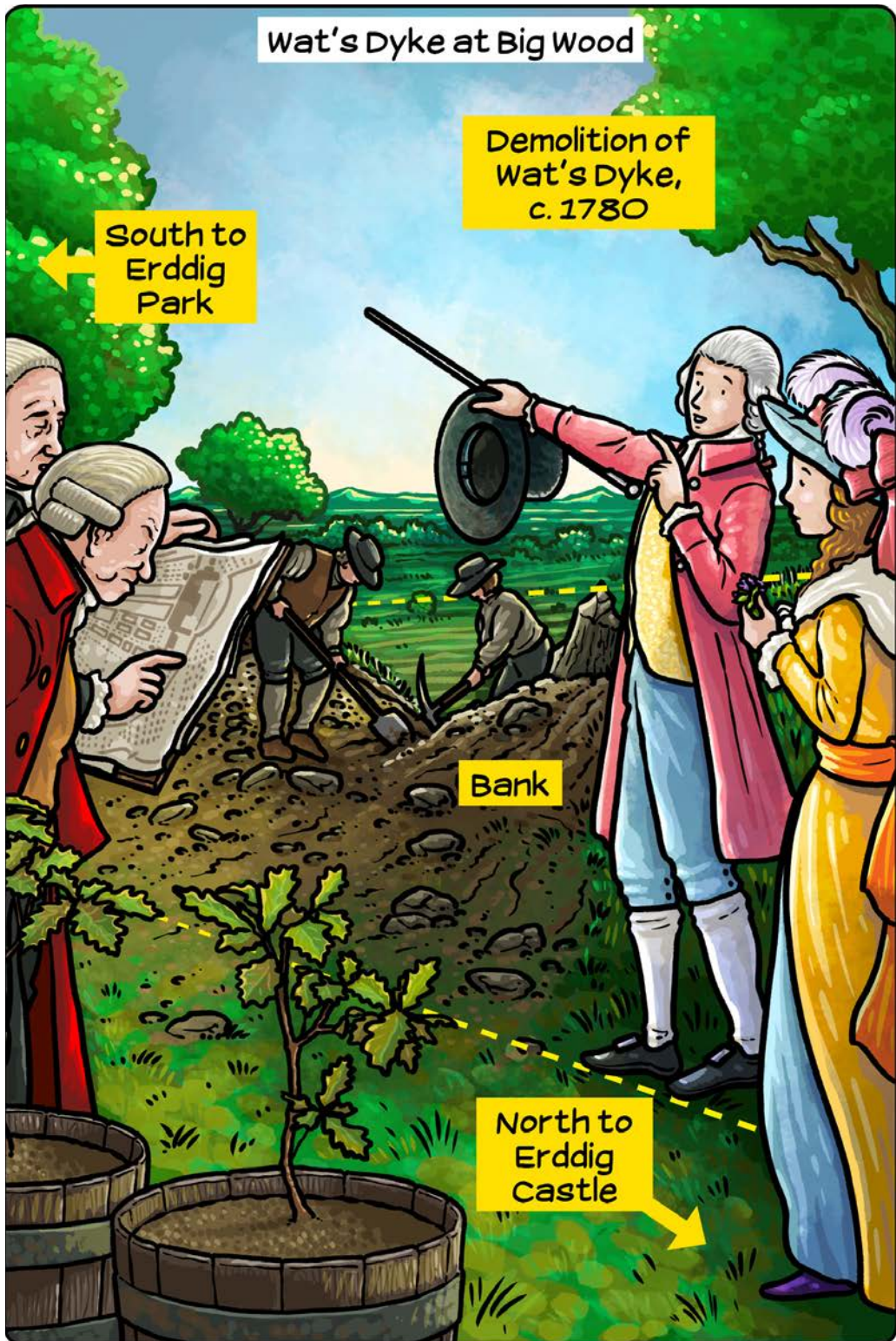
Visitors to the National Trust property of Erddig will struggle to appreciate that Wat's Dyke once ran along the top of the ridge overlooking the Black Brook right in front of where Erddig Hall was built in the 1680s and then refurbished and enlarged in the 1720s. Wat's Dyke was removed in this location during one or more stages of work around the hall, perhaps when Philip Yorke I commissioned William Emes to design the formal gardens between 1768 and 1780.

The industrial revolution was under way and the ironworks at Bersham was already well-established but the collieries of Bersham and Hafod have yet to mark the skyline. Yorke and his architect Emes observe the destruction of a section of Wat's Dyke at the edge of Big Wood.

Access

On foot: 650m walk from Erddig Hall. No bicycle and access via off-road mobility scooter only. Check accessible routes on Erddig Country Park website.

By car: park at Erddig National Trust main car park.



Sir Cyril Fox first explored Wat's Dyke in a systematic way as part of his broader project investigating Offa's Dyke. In the summer of 1932, he surveyed the well-preserved section at The Rookery south of Erddig Hall.

Small-scale excavations into Wat's Dyke took place through the 1970s-1990s led by David Hill and Margaret Worthington, including a dig in Erddig Park. Then, an important large-scale excavation at Gobowen (Shropshire) in 2006 by Tim Malim and Laurence Hayes explored and dated Wat's Dyke through radiocarbon (C14) and optically stimulated luminescence (OSL) which together suggested an early 9th-century AD date.

More information was gathered in 2018; Clwyd-Powys Archaeological Trust conducted excavations at multiple locations in Erddig Park. Their work has confirmed the line and character of the dyke in places where it wasn't clear whether it was ever built in the first place! Also, new scientific dates confirm Wat's Dyke was an early medieval monument. However, precisely when it was built and for how long it was used remains unclear.

We must ask: was Wat's Dyke a one-phase construction? Or instead, were different sections of Wat's Dyke built by successive Mercian rulers, maybe for contrasting purposes and over a longer duration? Perhaps only more investigations will answer these questions!

Access

On foot: via footpath from Erddig Hall (500m), footpath from Felin Puleston Outdoor Centre (1.7km) or footpath from Coed y Glyn (2.1km). Access via off-road mobility scooter only. Check accessible routes on Erddig Country Park website.

By car: parking in car park at Erddig Hall, in layby on Ruabon Road or in carpark at Felin Puleston Outdoor Centre.



Wat's Dyke was most likely built by one or successive kings of the Anglo-Saxon kingdom of Mercia during the late 7th-early 9th century AD. Like the longer Offa's Dyke, it was a monument built for war and peace: a statement of political ideology, power and authority, a military frontier work for attack and defence, and a structure to control trade and exchange and the landscape itself.

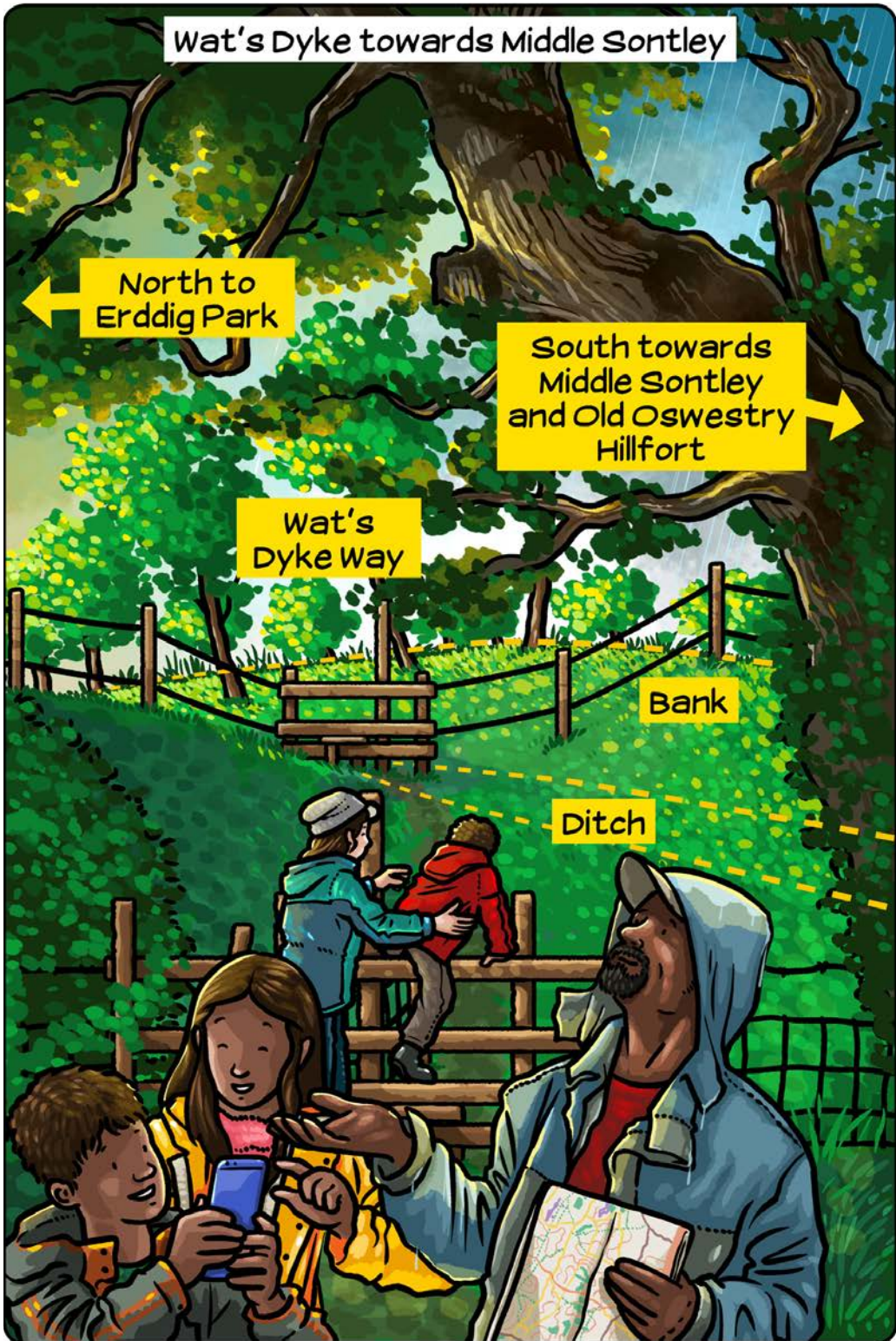
The work of David Hill and Margaret Worthington, investigating the monument as part of the Offa's Dyke Project, built on the work of Sir Cyril Fox and suggested that Wat's Dyke ran continuously from Basingwerk on the Dee Estuary to south of Maesbury in Shropshire: 64km!

Heading south out of the Erddig Estate, a fine section of the bank and ditch can be seen within the current field boundaries. Why not enjoy the rural countryside of Wrexham by following the Wat's Dyke Way south from Erddig to Middle Sontley and beyond?

Access

On foot: via footpath from Erddig Hall (700m), footpath from Felin Puleston Outdoor Centre (2km) or footpath from Coed y Glyn (2.2km). Check accessible routes on Erddig Country Park website.

By car: parking in car parks at Erddig Hall, Coed y Glyn or Felin Puleston Outdoor Centre.



What's Wat's Dyke? References and Resources

The story of Wat's Dyke doesn't end here. There is much more to discover and learn about the history, archaeology and heritage of this fascinating monument.

We've collected some references and resources on the following page if you're interested in learning more about Wat's Dyke, other linear earthworks, and Britain during the early medieval period.

And because the whole story of Wat's Dyke has not yet been written, we have included links to websites where archaeologists and historians discuss current research about Wat's Dyke and other early earthwork monuments. Some of the things you will find here include reports on recent archaeological work, articles about dating Wat's Dyke and discussions about how and why it was built.

We also recommend a visit to the Offa's Dyke Centre in Knighton, Powys, run by the Offa's Dyke Association. Offa's Dyke is an early earthwork monument very similar to Wat's Dyke, but much longer. The Offa's Dyke Association sponsors and supports research into Wat's Dyke as well as Offa's Dyke, and their new exhibition at their visitor centre now includes information about both monuments. For opening times and more information, please visit: <https://offasdyke.org.uk/>

The University of Chester runs undergraduate and postgraduate programmes in which you can explore early medieval archaeology. For more information, please visit: <https://www1.chester.ac.uk/departments/history-and-archaeology>

Books

Ray, K and Bapty, I. 2016. Offa's Dyke, Landscape and Hegemony in Eighth-Century Britain. Oxford: Windgather Press

Gleave, K., Williams, H. and Clarke, P. (eds) 2020. The Public Archaeologies of Frontiers and Borderlands. Oxford: Archaeopress.

Malim, T. and Nash, G. (eds) 2020. Old Oswestry Hillfort and its Landscape: Ancient Past, Uncertain Future, Oxford: Archaeopress.

Journal Articles

Belford, P. 2019. Hidden earthworks: excavation and protection of Offa's and Wat's Dykes, The Offa's Dyke Journal 1: 80-95.

Hill, D. 2020. "Offa's and Wat's Dykes". The Offa's Dyke Journal, Vol. II, pp. 141-159.

Swogger, J. 2019. "Making Earthworks Visible: The example of the Oswestry Heritage Comics". The Offa's Dyke Journal, Vol. I. pp. 137-156.

Worthington Hill, M. 2019. "Wat's Dyke: An archaeological and historical enigma". The Offa's Dyke Journal, Vol. I, pp. 58-79.

For Younger Readers

Swogger, J. 2018. The Oswestry Heritage Comics. Oswestry: Qube.

Williams, B. 1995. History of Britain: The Saxons & Vikings. London: Heinemann.

Online Resources

The Offa's Dyke Collaboratory – A Research Network for Offa's Dyke, Wat's Dyke and Early Medieval Western Britain:
<https://offaswatsdyke.wordpress.com/>

The Offa's Dyke Journal: <http://revistas.jasarqueologia.es/index.php/odjournal/index>



The "What's Wat's Dyke" comic heritage trail is a great introduction for all ages to one of Wrexham's best-kept heritage secrets: Britain's third-longest ancient monument!

Discover the past, the present and even the future of this fascinating medieval earthwork. Follow its story from the early Middle Ages, through the Norman conquest, the Industrial Revolution, the Victorian Era right into the present day, and see how Wat's Dyke has helped shaped Wrexham and its history.

You can also view the comic trail online:

<https://offaswatsdyke.wordpress.com/whats-wats-dyke-wrexham-comic-heritage-trail-by-john-g-swogger-and-howard-williams/>



What's Wat's Dyke?

Drawing the Line: What's Wat's Dyke? Practice and Process

John G. Swogger and Howard Williams

Often neglected and misunderstood, there are considerable challenges to digital and real-world public engagement with Britain's third-longest linear monument, Wat's Dyke (Williams 2020a). To foster public education and understanding regarding of Wat's Dyke's relationship to the broader story of Anglo-Welsh borderlands, but also to encourage the monument's management and conservation, we proposed the creation of a comic heritage trail (Swogger and Williams 2020). Funded by the University of Chester and the Offa's Dyke Association, we selected one prominent stretch where Wat's Dyke is mainly damaged and fragmentary and yet also there remain well-preserved and monumental sections. Around Wrexham, Wat's Dyke navigates varied topographies including following and crossing river valleys, and it is accessible to the public in the vicinity of North Wales's largest town. In this article we outline the dialogue and decision-making process behind the map and 10-panel comic: What's Wat's Dyke? Wrexham Comic Heritage Trail (Swogger and Williams 2021; Williams and Swogger 2021a–b). In particular, we consider the stages taken to adapt from the initial plan of producing a bilingual map guide in response to the circumstances surrounding the COVID-19 pandemic lockdowns. This digital resource, published online in Welsh and English, guides visitors and locals alike along a central stretch of Wat's Dyke around Wrexham town from Bryn Alyn hillfort to the north to Middle Sontley to the south. The comic heritage trail thus responds to the highly fragmented nature of the monument and utilises the linearity of Wat's Dyke as a gateway to explore the complex Anglo-Welsh borderlands from prehistory to the present day. Building on earlier discussions (Swogger 2019), What's Wat's Dyke? illustrates the potential of future projects which use comics to explore linear monuments and linear heritage features (from ancient trackways and roads to railways and canals) constructed across the world from prehistory to recent times.

Keywords: comics, heritage, public archaeology, Wat's Dyke

Introduction

Williams (2020a) reviewed the public archaeology and heritage of Wat's Dyke and introduced the challenge of developing new initiatives for engaging contemporary communities and visitors with the 'monumental intangibility' of the monument. This c. 62–64km-long bank and ditch was built near-continuously along the edge of the Welsh uplands from the Dee estuary at Basingwerk (Flintshire) to the Morda Brook south of Maesbury (Shropshire) (Fox 1955; Malim and Hayes 2008; Belford 2019; Worthington Hill 2019; Malim 2020). Traditionally regarded as a construction of the Mercian kingdom in the late seventh, eighth or early ninth centuries AD, it can be considered a 'frontier work' created to control and curtail movement through the landscape in times of peace and conflict. Debates and uncertainty persist regarding its precise date and purpose, notably whether Wat's Dyke was a predecessor, successor, or supplement to Offa's Dyke (e.g. Fitzpatrick-Matthews 2020; Ray 2020).

Williams (2020a) makes clear that Wat's Dyke is underappreciated and misunderstood by the public and experts alike. Indeed, it is under-represented in print and online maps, guides and other repositories and resources with few exceptions (see Burnham 1995; Lewis 2008). Counterintuitively, it is more readily apprehended by visitors and locals via naming practices of houses and streets, as well as schools, parks and a long-distance walking trail (Wat's Dyke Way) than as a monument in itself (see also Williams 2020b). Meanwhile, even when interacting with popular publicly accessible heritage sites, including the later prehistoric Old Oswestry Hillfort, the National Trust property of Erddig Hall and Gardens, and the industrial heritage landscape of Greenfield Valley, Wat's Dyke receives sparse, limited, vague and often inaccurate attention. Moreover, its associated walking trail and public profile are neither as prominent as its longer and better-known borderlands companion-monument: Offa's Dyke.

This situation should be a call to urgent action because, neglected in physical and conceptual terms, Wat's Dyke is prone to physical damage and neglect but also susceptible to appropriation by fringe narratives and political extremist appropriations. Indeed, only recently have the Offa's Dyke Association incorporated Wat's Dyke within their responsibility and charitable aims. This is especially problematic relating to contemporary discourses on Englishness and Welshness in this borderland region which have been amplified because of Brexit and the pandemic lockdowns. Despite north-east Wales being home to complex communities of recent immigrants and a long-term synergy between Welsh and English-speaking communities, divisive nationalist discourses are continuing to attach themselves to Offa's Dyke and thus Wat's Dyke by association, in framing and opposing English and Welsh identities and politics (see also Fitzpatrick-Matthews 2020; Ray 2020; Williams 2020c; see also Williams 2016, 2019a; Maldonado 2019).

This article reviews our journey from identified rationale to publication of the *What's Wat's Dyke? Wrexham Comic Heritage Trail*. Our aim with this article is to provide not only a record of our process, dialogue and decision-making of benefit for other practitioners and users of the comic, but also to provide a firm foundation upon which subsequent evaluations of its success can be built. However, at time of writing, we are not in a position to fully consider the impact of the comic among visitors and local communities, given the ongoing impact and legacy of the COVID-19 lockdowns and restrictions.

A heritage comic for Wrexham: from rationale to process

To address this specific set of socio-political circumstances, and building on the Offa's Dyke Association's enhanced charitable aims to support public engagement and appreciation of Wat's Dyke, Williams (2020a) proposed the development of:

1. A research, conservation and management strategy for Wat's Dyke and its multi-period landscape setting;
2. The production of an up-to-date map and guide book for visitors, available in print and digitally;

3. Fostering and supporting community archaeology projects to research and sustain interest in the monument.

In an earlier publication, we set out the rationale for a heritage comic as a means of promoting each of these discrete endeavours, both to explore Wat's Dyke in itself but also to use the monument as an anchor to convey aspects of the complex evolution of the Anglo-Welsh borderlands and its communities (Swogger and Williams 2020; see also Swogger 2019a–c, 2020). Having previously contextualised our approach in relation to other heritage comics, we now present the decision-making process of dialogue between an archaeologist and an archaeological illustrator to envision Wat's Dyke and its landscape biography in the environs of Wrexham. *What's Wat's Dyke? Wrexham Comic Heritage Trail* was conceived as an ideal test-case since it allows the exploration of a stretch of Wat's Dyke which incorporates sections both destroyed and denuded, along with as well as well-preserved sections, all within or in the vicinity of a large conurbation.

Fifteen potential readily accessible stretches were identified where locals and others can visit the monument and/or its former course (Table 1; Figure 1). Using a selection of these places, our aims are to:

1. foster local people's and tourists' ability to engage with the monument as it is, and imagine how it was;
2. craft a story to include landscape and biography and engagement with the different materials and components of the linear monument;
3. encourage recognition of the wider significance in early medieval linear earthworks in comparative terms – part of local borderland stories, as well as both 'English' and 'Welsh' national stories, and wider comparative international stories of conflict, territoriality, ideology and identity in frontier zones past and present.

The nature of Wat's Dyke around Wrexham presents a series of particular challenges to interpreting the monument in a way that explains its history and construction, its original context and meaning, and what has happened to the monument in the centuries up to the present day. Because of the broken and interrupted nature of the monument and its varied accessibilities and scales of survival, any explanation has to account not just for the monument itself where it can be seen, but also for the spaces between where it survives: its absence as well as its presence within the heritage landscape of Wrexham. But despite the fact that the surviving fragments of the Dyke can be difficult to see, challenges both to access and interpretation, an engaging story about the monument, its likely (but not proven) seventh to ninth-century functions and meanings, and its later history, can be told to those who visit it.

Table 1: Key locations of Wat's Dyke in Wrexham identified Howard Williams's blog-post 'Where can you visit Wat's Dyke in Wrexham' augmented by others and subject to discussion in this chapter as foci for the development of the What's Wat's Dyke comic (after Swogger and Williams 2020).

Map Number	Location Name	Features	Access
1	Alyn Waters Country Park	No surviving traces of the monument on the scarp above the valley, but the likely line of the Dyke frames the top of the valley slope overlooking the country park	Access on foot or bicycle. If arriving by car, park in one of the designated car parks for Alyn Waters Country Park and walk or cycle from there
2	Llay New Road	No clear traces of the dyke surviving, but the top of scarp overlooking the Alyn is where the Dyke likely ran	Access on foot on the Wat's Dyke Way, or park and walk from Alyn Waters Country Park
3	Bryn Alyn Hillfort	The possible line of the Dyke descending into the valley from the site of the Iron Age hillfort	The hillfort itself is on private land, but the footpath beside the river allows views
4	Bluebell Lane, Pandy	Multiple surviving sections of Wat's Dyke surviving as field boundaries	Park on Bluebell Lane, Pandy and on public footpath across the fields following the Wat's Dyke Way
5	Ty Gwyn Lane, Garden Village	A section of Wat's Dyke preserved as a property boundary facing over a public park between housing developments leading uphill to Wat's Dyke Primary School	Park on Wat's Dyke Way or Tegwen Lane and accessible on foot or bicycle
6	Wat's Dyke Primary School	The monument survives in a 'green lung' stretching south of Wat's Dyke Primary School west of Buckingham Road	Park by Wat's Dyke Primary School or on Buckingham Road and access on foot or by bicycle
7	Crispin Lane, Wrexham	Wat's Dyke survives on line-side land east of Crispin Lane	Park on Crispin Lane or walk from Wrexham General railway station.
8	Premier Inn, Wrexham General Railway Station	A reconstructed segment of Wat's Dyke sits adjacent to the Premier Inn parallel to the railway line	Opposite Wrexham General railway station
9	Coleg Cambria, Wrexham	South of the Ruthin Road, Wat's Dyke survives beside allotments and an alleyway	Walk from Morrisons supermarket, Bellevue Park
10	Wrexham Cemetery	Wat's Dyke runs through the older graves on the west side of the municipal cemetery	Park at Wrexham Cemetery or in layby on the Ruabon Road
11	Court Wood	A well-preserved pair of sections of Wat's Dyke used as a modern property marker	Accessible on foot from any of the National Trust car park situated on the Erddig estate, on Wat's Dyke Way
12	Erddig Castle	The Anglo-Norman castle of Erddig reused a location deployed in the line of Wat's Dyke	Accessible on foot from any of the National Trust car park situated on the Erddig estate
13	Big Wood, Erddig	Well-preserved segments of the monument in woodland between the castle and Erddig Hall	Accessible on foot from any of the National Trust car park situated on the Erddig estate
14	The Rookery, Erddig Park	A well-preserved section of Wat's Dyke overlooking the Black Brook	Accessible on foot from any of the National Trust car park situated on the Erddig estate, on Wat's Dyke Way
15	South of Bryn Goleu to Middle Sontley	A well-preserved section of Wat's Dyke	Accessible on foot from any of the National Trust car park situated on the Erddig estate, on Wat's Dyke Way



Figure 1: Map of the key locations of Wat's Dyke in Wrexham identified for HW's blog-post 'Where can you visit Wat's Dyke in Wrexham?' augmented by others and subject to discussion in this paper as foci for the development of the What's Wat's Dyke comic (Map by Howard Williams, 2020, after Swogger and Williams 2020)

As Swogger (2019a–c) surveys, comics have become a critical media utilised to explore many themes and debates in public archaeology and heritage (Swogger 2019c), but they have a particular power to tell the stories of heritage in borderland contexts (Swogger 2019a). Yet, the potential for the comic medium for specifically telling this linear earthwork's story around Wrexham was discovered when the authors during field visits, touring the dyke in autumn 2019 (see also Williams 2019b). It became clear that the key to understanding the monument lay in being able to (1) spot what was hidden, (2) reconstruct what had vanished, and (3) provide context for what was isolated or disjointed. This applies to rural, suburban and urban areas as well as the cemetery and parkland where it is at least partially marked. To be explicit: no previous attempts to recognise and interpret Wat's Dyke are consistent, clear and satisfactory (Williams 2020a; Swogger and Williams 2020).

We began to design a guide locals and visitors to Wat's Dyke across Wrexham by car, bike, on foot or via mobility scooter. The choice of points on this map, and the design of the visualisations, will in turn help tell the larger story of the reasons for the dyke being sited where it was, the different ways in which it was constructed, and the reasons why it no longer survives as a contiguous whole. Almost incidentally, such an explanation will also serve to introduce audiences to the rest of the history of Wrexham: Wat's Dyke providing a literal and metaphorical thread to follow through the town's story. If the eventual aim of better presenting Wat's Dyke is to better engage both local as well as visiting audiences with the monument, then it may be that interpretations of the dyke will need to move away from 'specialist', site-based presentations. Exploring how local communities already engage with Wat's Dyke – even just as a street name – may provide a useful starting point for alternative mechanisms for engagement.

Our map and comic panels hence aimed, for the first time, to help those touring the monument to spot it in various contexts and states of preservation. Let us now review the results and our strategies and choices with each image.¹

The map

Our original plan had been to produce a printed map. However, restrictions imposed from the COVID-19 pandemic made a digital comic much more logical and viable, taking full advantage of digital media. The map was intended to function as an informational 'hub' for the tour. Each location on the map was embedded with hyperlinks so that the explanatory panels could be accessed directly. The advantages here were that readers were not necessarily bound by any linear format or predetermined reading order, nor even by the geographical realities of the locations themselves.² This non-linearity has therefore both spatial and chronological dimensions: allowing readers to explore a linear monument through time and space at their own choosing without a fixed singular narrative.

Since the objective of the comic was to facilitate visits to the monument, the map contained information which might help readers select locations according to 'visitor-based' priorities and criteria: road routes, parking, public transport connections and disabled access. As not every location is equally accessible for all types of visitors, the importance of noting such information was highlighted by preview audiences on social media. Accessibility was also indicated visually in some of the panels (comic panel 3, location 6, is the best example), adding further detail to the information on the map. The

¹ The comic was launched to coincide with the Council for British Archaeology's Festival of Archaeology on 19 July 2021: (Swogger and Williams 2021a) and published on the website of the Offa's Dyke Collaboratory (Williams and Swogger 2021a). The entire comic is published in this volume (Williams and Swogger 2021b).

² However, this approach does mean that every panel in the series must be able to function as the *first* panel in the series, meaning that every image and text must be written without assuming prior knowledge in the reader of any other panel or piece of text in the series. This requires careful mapping of, in particular, definitions of terminology and core concepts.

map deliberately echoed the comics panels in both style, lettering and colour palette, so that the map would feel like ‘part of’ the panels: the line of the dyke and the labels for each location on the map, for example, used the same colour yellow as the labels and dashed lines in the comics panels which indicated the location of the dyke.

Locations and panels

Location 1 – Alyn Waters Country Park – SJ 362 545

We had originally considered a location at Alyn Waters Country Park given it is a popular leisure destination and on the line of the Wat’s Dyke Way long-distance walking trail. However, Wat’s Dyke does not survive as a discernible earthwork here and its former location is inaccessible within field boundaries without public access. Hence, we decided to reference how Wat’s Dyke heads north following the top of the eastern scarp overlooking the River Alyn at location 3 rather than feature this location in the heritage trail itself. There is potential to include this location if the heritage trail is expanded.

Location 2 – Llay New Road – SJ 330 543

From the modern Bradley–Llay Road (Llay New Road) one can access the top of the scarp above the River Alyn in two directions (north-west and south-east). It is surmised that Wat’s Dyke once ran along here overlooking the Alyn valley. Today it is accessible via footpaths which are part of the Wat’s Dyke Way. However, there are no definitive traces of the monument to either side of the road and so we decided to reference the route at this location in the comic panel for location 3. Again, there is potential to include this location if the heritage trail is expanded.

Comic panel 1, location 3 – Wat’s Dyke at the River Alyn – SJ 332 531

For our first panel location we selected the junction of Plas Acton Road and Blue Bell Lane where Wat’s Dyke is destroyed and lost. Still, this location allowed discussion of the monument’s likely behaviour in relation to the River Alyn, incorporating Bryn Alyn Iron Age hillfort (which is on private land and thus omitted from the Wat’s Dyke Way footpath). While the walk down to the Alyn through Wilderness Wood is steep and there are no traces of the monument to be seen, it makes sense to start with stretches where the monument is absent in today’s landscape and envision how it might have once appeared. So, we began by showing a long-distance vista north from this vicinity, all of which one cannot see today. We show how Wat’s Dyke follows the top of the eastern scarp of the Alyn valley to the north, but as it approaches the Alyn it drops down the river cliff, traverses the river before rising up south towards the higher ground upon which the viewer stands. This allowed us to discuss how the monument operates in relation to river valleys in two contrasting fashions – following and blocking – and thus responding to the topography.

This panel therefore introduces the longer-distance route and strategic placement of the monument. We also made guesses about the relationships with trackways, watch towers, beacons and the structure of the monument itself. We decided to show Wat's Dyke palisaded with watch towers *behind* rather than included in its line, not because of any specific precedent.³ We left the possibility of gateways' presence, form and character to the imagination, but implied by a Mercian warrior gesturing to a Welsh farmer with his cow as to where he might go to pass through the monument. In this way we depict Wat's Dyke as a formidable and military barrier, but one lightly and intermittently guarded, deployed to control movement in peacetime as well as in times of conflict. This is in stark contrast to former representations which emphasise its role in conflict almost exclusively (Williams 2020a: 174, 182). In the text, we conjure a sense of what the monument might have looked at, but we also posed questions regarding the duration and character of its active use and the nature of its relationship with water courses and the reuse of the Iron Age ramparts (see also Williams 2021).

Comic panel 2, location 4 – Wat's Dyke at Pandy – SJ 333 527

While panel 1 depicted the Early Middle Ages, panel 2 envisions the monument in today's landscape. For this second panel we selected the line of the Wat's Dyke Way along footpaths in the fields south of Pandy to where Wat's Dyke is bisected and broken by the line of the A483. Here, we depicted an aerial perspective showing the intermittent and varied survival of the monument's bank and ditch, as well as the relationship of the earthwork to fields in which animals graze and local dogwalkers and others take their exercise. This angle also encourages visitors to appreciate Wat's Dyke's relationship with sections of the monuments further north in the Alyn Valley and south towards Wrexham town centre but poses the question: do local folks realise they are walking along Wat's Dyke at all (there are no heritage interpretation panels)?

Location 5 – Ty Gwyn Lane – SJ 333 525

Wat's Dyke is preserved in the rear property line of back gardens along Wats Dyke Way. While there is potential to include this location if the heritage trail is expanded, this section is effectively subsumed into the discussion of panel 3, location 6.

³ There have been no attempts to represent the infrastructure of Wat's Dyke, with many presuming there were none as default. Certainly, there is no direct material evidence for any towers, gates or other features. However, we were keen to raise the possibility that (a) the linear earthwork did not exist in isolation but as part of a wider network of installations and features (inspired by Ray and Bapty 2016: 229–251) and (b) that watch towers and fortlets might have been situated to maximise visual communications along the monument's line and both forward and back over longer distances (see Murrieta-Flores and Williams 2017), not built on the bank itself to observe the immediate foreground. For this reconstruction, we created the simplest possible structure, without even a roof, but other scenarios are of course possible. In doing so, we prompt conversations about possible alternative reconstructions of the monument, rather than attempting to impose a singular vision.

Comic panel 3, location 6 – Wat’s Dyke at the School – SJ 331 518

Having represented how Wat’s Dyke may have appeared when newly constructed and how it endures in fragments in a semi-rural environment, bisected by modern roads and disrupted by field boundaries and field gates, we move into Wrexham’s suburbs. Panel 3 shows how Wat’s Dyke has been incorporated into modern property boundaries in Garden Village. Whilst ‘consumed’ by development, Wat’s Dyke remains a prominent feature traversed by footpaths, running past and giving its name to Wat’s Dyke Primary School.

We chose to represent a section of the monument 350m south of Wat’s Dyke Primary School where the tarmac alley from Buckingham Road traverses the surviving bank. Because the tarmac means the rampart is free of vegetation, it serves to preserve its profile. This location thus reveals the scale of the monument despite damage and interruptions to its original continuous form. Meanwhile, it shows how the monument, even where near-invisible to non-specialist, still interacts with people’s daily lives as they ascend or descend the surviving bank under tarmac. It also meant we were selecting a location where the Dyke was readily accessible to those with mobility challenges and for whom other sections of the monument might not be so easily accessible.

Comic panel 4, location 7 – Wat’s Dyke at the Football Ground – SJ 331 518

Complementing the rural, semi-rural and suburban representations of Wat’s Dyke, we next explored how Wat’s Dyke is subsumed within the western edges of Wrexham town centre. Here, the monument survives in badly damaged sections between the railway line and Crispin Lane as it approaches Wrexham General railway station and close to other well-known Wrexham landmarks, including Wrexham AFC’s home ground. The pre-eminent locator of the football ground was chosen less because of immediate proximity as because it situates the Dyke in terms of modern routes but also modern preoccupations, sports and leisure. Here, we adopted what was closest to a map view; a high aerial perspective in order to illustrate multiple locations on either side of the Mold Road and Wrexham General (in other words locations not visible from each other on the ground) in one image.

Location 8 – SJ 329 507

The reconstructed Wat’s Dyke next to the Premier Inn could be the focus of a future expansion of the heritage trail. In that circumstance, it would be a valuable place to discuss the value and challenge of reconstructing ancient monuments. However, the idea to represent the reconstructed section of Wat’s Dyke between the Premier Inn and the railway lines separately was abandoned since it became readily feasible to incorporate this location into the overall representation of comic panel 4, location 7.

Location 9 – SJ 327 498

A future expansion of the heritage trail could readily show Wat’s Dyke running close to the Morrisons supermarket and along property boundaries close to Coleg Cambria beside

allotments. However, we decided to incorporate reference to these relationships in the text accompanying comic panel 5, location 10, rather than creating a separate panel for this stretch.

Comic panel 5, location 10 – Wat's Dyke at the Cemetery – SJ 326 495

The only place where Wat's Dyke has been inscribed in today's landscape is within Wrexham Cemetery. Here, the monument appears on the cemetery sign and where the cemetery paths cross the line of the monument in Wrexham Cemetery (Williams 2020a: 178–179). Covered in graves, we decided to show the late Victorian cemetery in use, with a funeral taking place and a new coffin being interred into the bank of Wat's Dyke. This allowed us to discuss the interplay between early medieval past and Victorian necrogeography through the choice to reutilise the bank into the landscape design. Furthermore, it specifically allowed us to show the cumulative interplay between Victorian funerary monuments of different scales and subjects, including one inspired by early medieval carved stone monuments, associated with Wat's Dyke (in other words, the landscape involves multiple funerary medievalisms including both reuse and replication).

Comic panel 6, location 11 – Wat's Dyke at Court Wood – SJ 326 493

For a second panel, we envision the Early Middle Ages and imagine Mercian warriors and a thegn intercepting Welsh herders and their livestock beside the Afon Clywedog with Wat's Dyke looming above. We aimed this to contrast with comic panel 1 in showing how Wat's Dyke was more than a borderline to defend, but the spine of a complex frontier infrastructure controlling traffic along key valleys (see also Ray and Bapty 2016 for Offa's Dyke). Meanwhile, while Comic Panel 1 showed warriors behind Wat's Dyke, we here articulate that Mercian control extended to the broader landscape westwards and how horse riders would sustain communication and organisation in this landscape of control. The impressive and intimidating nature of the Dyke and its careful use of the natural topography is also captured in autumn.

Comic panel 7, location 12 – Wat's Dyke at Erddig Castle – SJ 326 487

We jump forward to the late eleventh or early twelfth century in our choice to represent Wat's Dyke as an already ancient monument incorporated into the ramparts of an Anglo-Norman motte-and-bailey castle on a prominent spur (see also Swallow 2016). We consulted widely on the appearance of the motte-and-bailey castle but the aim was to show not just the castle, but the strategic associations of both Wat's Dyke and the later castle with the confluence of the Black Brook and the Afon Clywedog. Incidentally, we also think it near-unique to portray an Anglo-Norman castle in wintertime, thus also allowing the landscape to be shown through multiple seasons across each panel.

Comic panel 8, location 13 – Wat's Dyke at Big Wood – SJ 325 483

To our knowledge, this was the first time an archaeological illustration has focused on the removal of an ancient monument in the post-medieval period because archaeological illustration

since maps and images of designed landscapes tend to show idealised representations of use, not the landscaping in process. We used this scene to explain Wat's Dyke's intermittent deliberate obliteration through sections of the Erddig estate, especially in front of the house. Meanwhile, the image serves to foreground the absence of heritage interpretation for the monument by the National Trust; this is a distinctive opportunity to envision the monument for large numbers of contemporary visitors (Williams 2020a: 177, 180).

Comic panel 9, location 14 – Wat's Dyke at Erddig Park – SJ 325 480 and SJ 324 478

The contrasting preservation of Wat's Dyke along the top of the escarpment down to the Black Brook provided an opportunity to show the history of archaeological investigation, juxtaposing Sir Cyril Fox surveying the monument in this location in 1932 with an image of Clwyd-Powys Archaeological Trust's recent excavations close by (Belford 2019). Again, to our knowledge this is a first attempt to use comics to show archaeological investigations into linear earthworks as opposed to simply their past and present-day appearances (see Swogger 2020).

Comic panel 10, location 15 – Wat's Dyke towards Middle Sontley – SJ 323 475

We wanted to include a fully rural setting for Wat's Dyke in one panel and selected a location where the monument is followed by the Wat's Dyke Way, running south from Erddig Park. Here, we remind readers that the monument expands far beyond the confines of the section around Wrexham. Walkers can explore it for shorter distances or longer treks. Furthermore, we wanted to capture how the monument navigates different landscapes and is part of a broader landscape with wildlife and views. In short, this image seeks to explain that you can use traditional maps and digital resources, taking short outings or longer expeditions, and still encounter Wat' Dyke, showing individuals of different ages and genders and using different devices (mobile phone and map).

Having reviewed the final product, let us delve into the process of dialogue involved in its creation. This not only explains the choices adopted for our comic, but reveals the creative dialogue which might inform those wishing to work on comics themselves.

Practice and process

Published online as a series of non-linear hyperlinked web pages, and then in booklet form as a walking guide, *What's Wat's Dyke?* may not look like a standard comic. And the question of whether this work is or is not a comic (Wysocki, pers. comm.) has implications when understanding how the authors chose to frame and present information about Wat's Dyke. Comics about history, archaeology, and cultural and community heritage may take many forms: they may be short, four-panel strips or longer narrative works. Such works may also adopt different narrative positionalities – personal (Richardson and Pickering 2021), fictive (Rajic and Howarth 2021) or revisionist (Lopez and Sheyashe 2021) – and utilise different qualities of aesthetics (Brophy and Sackett 2019), genre (Vowel *et al.* 2019) and style (el-Gawad and Stevenson 2021).

Comics encompasses all these forms and more because it is not defined by publication format, narrative voice, genre or aesthetic approach. Rather, it is a medium defined by a relationship between image and text (Brunetti 2011: 45; McCloud 1993: 17; McCloud 2006: 129). In a comic, image and text do not simply accompany one another, but are interrelated in such a way that the resultant narrative emerges from a dual reading of image and text together. An illustrated article may be understood without its figures; a map may be useful even without an accompanying explanation - but a comic cannot be meaningfully understood by looking at the images in isolation or reading the captions and speech balloons on their own. The specific combination of 'word+image' in each panel or on every page - different in each of the comics above, for example - have been chosen in order to evoke specific readings.

Similarly, the evocation of place and meaning in *What's Wat's Dyke?* cannot be acquired by viewing Williams' text nor Swogger's artwork separately. Swogger's artwork for 'Wat's Dyke at the School' (comic panel 3, location 6) shows the Buckingham Road alleyway and visually describes how to spot the earthwork remains of bank and ditch; the text discusses its historical context in both the 1930s and the early medieval period. The art does not replicate the text, nor vice versa; instead, the "whole story" emerges from the interaction between the two. Thus, regardless of the publication format, either as a series of non-linear hyperlinked pages or as a walking guide booklet, narrative voice, genre or aesthetic approach, it is the affordances of the *medium* which define the work and how it is read. Comics, as a communication toolset, has allowed the authors to frame and present both the invisibility and disconnectedness of Wat's Dyke as monument and information about it in a particular way.

If a comic is much more than simply image and text - rather, image and text working together - then the dynamic between the two elements can be considered a unique third component. When creating a comic, choice of image and selection of text are simply the starting point. It is how they are brought together, how they play against one another and how that interaction shapes the narrative which is the essence of the process. In the same way, the creative dynamics involved between those making a comic - writer, artist, consultant, editor, and so on - determines the effectiveness and affectiveness of the final output as much as the choice of words, style of artwork or nature of the content. To understand how an applied comic such as *What's Wat's Dyke?* is made, it is necessary to understand how those two dynamic relationships play out in both practice and process.

The multiple moving parts involved in comics creation means it is sometimes difficult to identify a clear beginning to a particular project. Where did the idea come from? Whose idea was it? How did the idea first take shape? Indeed, the final product of many comics projects are quite different from the initial concept, if only because - in archaeology, at least - it may be the first time ever that the medium has been applied to a particular subject matter, site or monument.

This was certainly the case with *Wat's Dyke*. Not only had there never been a comic about it made before, meaning that there was a complete lack of precedent for approach,

visual style, content or intended audience, there is also minimal published academic or ‘popular’ writing about the monument. Indeed, there is even minimal on-site interpretation material for the monument (Swogger and Williams 2020: 198; Williams 2020a: 172–184). It can be harder to work from a completely blank canvas: a lack of precedent also means a lack of boundaries, a lack of intellectual ‘map’ with which to chart the progress of a project.

Charting the development of an applied comic from idea to final product can also be difficult because the parts played by different participants are not fixed, nor is the schedule through which they interact necessarily the same from one project to the next. In contrast to the process by which an academic article is created, there is considerably more blurring of roles and boundaries. Taking this article as an example, decades of publishing precedents have established fairly clearly delineated parameters for the role of author, co-author and journal editor. Each person involved in the process tends to understand what is expected of them, where in the production timetable they will be making their contribution, and what the outcomes of that contribution are.

This is not necessarily the case in the creation of an applied comic. Even with only two creative participants, roles were shared and swapped, overlapped and re-prioritised, expanded and constrained in different ways for each individual illustrated panel and accompanying text. The dynamics of applied comics creation are not often documented, but when they are it is clear that they vary considerably not just from one project to the next, but even within the course of an individual project (Wysocki *et al.* 2020). Broadly, each of the *Wat’s Dyke* panels began with a sketch and draft text from Williams, which was then incorporated into a draft image by Swogger. Comments and feedback from Williams were then returned to Swogger, resulting in a more advanced draft, at such time the text was then also modified, leading then to a final draft of both text and image. Yet, even across only ten panels, this model was subject to much alteration. In the case of some panels, such as 4, more feedback and response took place, including the creating of an alternative version which was ultimately rejected. Whereas with some panels, such as panel 10, the process was much more straightforward. This panel involved only one round of feedback and no modification of the text. With panels 6 and 7, the inclusion of detailed representations of a thegn and a motte-and-bailey castle, respectively, prompted us to solicit specialist feedback from experts via social media; some of their suggestions were included, some were not. The specifics of some of these exceptions to the above rule are explored in more detail below.

Finally, there were considerations and constraints given the timing and circumstances of the comic’s creation. *What’s Wat’s Dyke?* began life pre-pandemic, conceived as a tourist information style map-based leaflet (Swogger and Williams 2020). During 2020 and 2021, much of the context for the project which had been utterly taken for granted in 2019 shifted dramatically. Assumptions about how the comic was to be produced, how it would be distributed and who its audience would be – elements

which have a direct impact on how the comic would be written and drawn -- had to be completely rethought. How can you encourage people to visit a monument when the country is in lockdown? How can you distribute an informational product when visitor centres, schools and museums are closed? As elsewhere in the heritage industry, rapid readjustment was necessary at a time when work, home and family were also subject to the same renegotiations to find 'the new normal'. During its production, the scale and pace of removal of lockdown restrictions were unclear, and even now (September 2021), much remains uncertain about the future. Assumptions about how the practicalities of a collaborative project would be organised were similarly overturned. No casual dropping-in to offices for a quick chat about panel three, no day-long rambles over the Dyke, no pop-up public consultations. Instead, face-to-face meetings became Zooms, casual conversations became emails, and even visits to the Dyke itself became complicated by access and social distancing. All of these things, too, had their impact on the way the comic came together and the dynamics which shaped its creation.

Documenting such things is about more than simply recounting how the present authors spent Lockdown. The practice of making comics about archaeological sites and monuments is still very much in its infancy. It is a new field, and practitioners, commissioning clients, consultants, artists and audiences are all still finding their way, figuring out what works best and how to turn the lessons from one project and one set of circumstances into guidance on how to do the next (Swogger 2019a and 2020c). While all creative practice tends to have its element of quirk, serendipity and mystery, that should not simply be boiled down to 'well, you'll just have to figure it out on your own', in determining general principles or transferrable approaches. It should be possible to use the specifics of practice and process of *What's Wat's Dyke?* to help inform other comics projects about other earthwork monuments, early mediaeval archaeology, or invisible, overlooked or neglected heritage. One would like to hope that *What's Wat's Dyke?*, as well as informing one kind of audience about this somewhat overlooked early medieval earthwork, would also inform another kind of audience about how they might approach a comic about (for sake of argument) Bronze Age burial mounds or rural medieval moated sites.

Rather than speak in generalities, the intersection of creative dynamics, collaborative dynamics and practical considerations can be examined by looking in more detail at one panel as a particular case-study: panel 3, 'Wat's Dyke at the School' (although the discussion will also inevitably draw on other panels in the series).

Wat's Dyke at the School

The line of Wat's Dyke preserved along the back-garden boundary of Wrexham Garden Village, where it divides the houses and the grounds of Wat's Dyke Primary School from the green space and playing fields to the south, featured strongly in early conversations between the authors as far back as the autumn of 2019. Possibly, it may have even cropped

up in conversations as a clear example of the lasting physical legacy of the Dyke's bank and ditch in the landscape before then. And while the location was only briefly noted by Williams in a blog-post on Archaeodeath in early 2019 (Williams 2019b, 2019c), when visiting Wat's Dyke later that year to determine which areas would feature in the comic, the Buckingham Road alley location quickly became a focus for that section of the dyke. Indeed, it was subsequently highlighted by the authors in their outline of the proposed comic project the following year (Swogger and Williams 2020: 202).

The rough draft figure which accompanies a discussion of the location demonstrates the extent to which the location had become key to outlining the proposed approach for the comic. In the rough draft, Williams stands as narrator in front of the surviving section of the bank and ditch, which is then partially reconstructed on one side, showing a possible palisade and watchtower. The rough draft image incorporates key conceptual and creative elements: the use of an identifiable researcher-as-narrator, the depiction of an actual location as a means by which a reader might then be able to identify the monument on the ground, and a reconstruction showing the monument as it might have looked when originally constructed (Figure 2).

The subtle but important changes that distinguish this, proposed, rough draft and the final draft that ultimately emerged catalogue the dynamic nature of the creative process, and serve – in microcosm – as a guide to the nature of some of the working relationships between writer, artist, editor and audience.

Point of view

The first notable difference between the two panels is the point of view. In the proposed rough draft, the view is at ground-level; in the final version, it is from a position about twenty feet from the ground. While the rough draft view is more 'realistic', in that it is more likely to be shared by a prospective audience, the final draft view shows the bank and ditch more clearly, while still being proximal enough to human-scale to allow a reader to distinguish and appreciate the actions and roles played by the people within the image. The point of view also allowed for the inclusion of more than one person, and so enabled the inclusion of more than one informative perspective: that of the cyclists and accompanying parent, the walker with the dog, and the person on the mobility scooter. These figures do more than simply fill up space. First and foremost, they provide a sense of scale and context. The figures allow us to tell intuitively, without resorting to the artificiality of a metre-stick, the size and extent of the bank and ditch. This sense of scale is reinforced by the placement of figures at more or less regular intervals along the surviving monument. They also provide clues as to the context for the monument's location as domestic, household, ordinary and every day. These figures are out for a late afternoon stroll, not far from back gardens, sheds and patios. They help embed the idea of Wat's Dyke as surviving – literally – on 'home turf'.

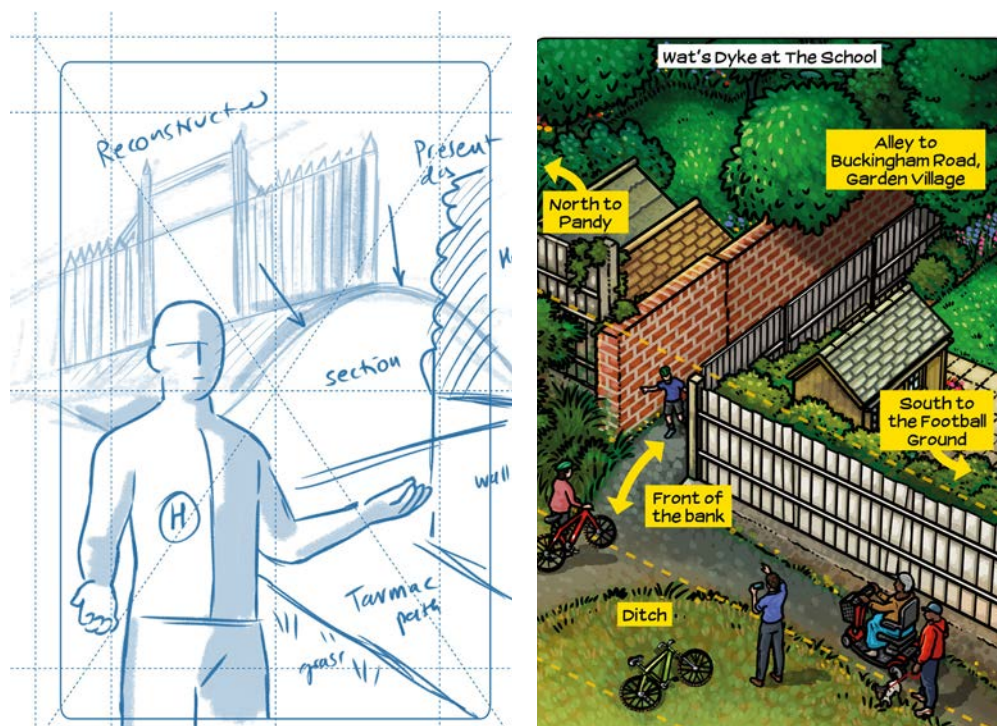


Figure 2: (a) draft of panel 3 and (b) the final image, both by John Swogger

This shift in point-of-view came in May 2021, eighteen months after the authors' initial 'on-the-ground' discussions and the subsequent publication of the proposed rough draft for this panel. And while the passage of time can certainly have an impact on creative direction, what was more significant was the impact of the pandemic. As previously described (above), the pandemic engendered a shift in presentation from the real to the digital: from a map-leaflet to a series of hyperlinked pages. This shift affected more than just the potential audience and mode of consumption of the comic: it affected its content.

What people mean

The second notable difference between the rough draft panel and its final iteration is that the figure of the researcher-as-narrator has vanished. This is usually a key component of other similar works. The inclusion of the researcher-as-narrator within the comic enables the audience to identify clearly who carries out research, and for the story of that research to be presented in the first person. Often, this is one of the only times when such researchers are afforded this kind of visibility in public outreach. It makes scientific and fieldwork narratives more grounded and more human-focused (Swogger forthcoming). But in the shift to an online presentation, that visibility and voice could be carried by the hosting context – in this case, on the pages of the Offa's Dyke Collaboratory.⁴

⁴ When subsequently published in print (Williams and Swogger 2021a), the presence of a cartoon version of Howard Williams fronting the booklet's introduction reinstated this integral researcher-as-narrator.

Made during the revision to the rough draft 18 May, the decision to drop the foregrounded figure of the narrator served to open up the panel visually, enabling more of a focus on the details of the surviving section of bank and ditch. The trade-off was noted in correspondence between the authors:

Despite liking tremendously your ground-level perspective... I feel that this is going to work much better, with the colour coding implying the surviving hint of former bank and ditch only partially surviving in the steep rise of slope towards the alleyway.⁵

Considerations of what is shown, how and why are not just confined to the archaeology – or to the past. Here, the decision not to include a narrator was taken with the understanding that the presentation itself would afford information about the identity of the researcher. In a similar way, the attitudes and activities of the figures in the panel were used to encode other, non-archaeological information about the location: the fact that it was accessible on foot, by bicycle and by those walking dogs: ‘...as with Pandy, this is dog-walking zone, so maybe add a hound on a lead again...’⁶

The image was further amended to include a woman on a mobility scooter: following the preview of the comic on Twitter a commentator queried which sections of the trail were fully accessible. As noted above, this information was eventually included in the form of icons on the main map. In this context, the presence of a figure using a scooter cemented that meta-information within the comic itself.

Marking time

The third notable difference between the rough and final drafts of the panel was the lack of any reconstruction element, showing the form and extent of the dyke as it might have originally been constructed. Instead, the presence of this original form and extent is indicated by dashed lines, an arrow to indicate slope, and labels for ‘bank’ and ‘ditch’. This decision, made by Swogger independently of Williams, was taken in light of the developing rough drafts for the entire series of ten panels – something which had not been done when the original rough draft was published. This shifting around of elements, viewpoints and informational perspectives demonstrates one of the unique affordances of comics. As a single image, it might make sense to try and fit as much information as possible into one piece of artwork – but as one image in a series of ten, it made more sense to spread the informational load across all the artwork. Each picture, then, could focus on a subset of the entire informational content. Panels 1, 5, 6, 7 and 8 all featured the Dyke at times other than the present; panels 1 and 6 specifically in the Early Middle Ages. As far as panel 3 was concerned, the ‘job’ of depicting the Dyke as it might have originally been constructed had been taken up by others in the series, leaving

⁵ Email, HW to JS, 18 May 2021.

⁶ Email HW to JS, 18 May 2021.

this one free to focus more completely the visual complexities inherent in the partial survival and partial re-use of the bank within the Garden Village boundary, as Williams indicated: 'It's arguably the most important and most difficult we have to execute....'⁷

In a medium which uses sequences of images to help structure informational narrative, explanation can be divided up between multiple images: in this case, panels. Spreading out an explanation through the course of a reader's engagement with the work as a whole alleviates the need for any given image to do 'everything'. Each panel explains Wat's Dyke at a specific place but each panel also contributes towards a larger explanation of the earthwork's as a (whole) monument, across multiple places. Thus, the visualised explanation of the dyke 'as it might originally have been', in panel 1, can be combined by readers with the visualised explanation of the dyke 'as it survives at Buckingham Road' to create a total informational impression that is more than simply the sum of constituent parts. However, because the map provided a 'hub' to the work, through which panels and locations could be accessed by a reader irrespective of any north-south geographical connection, each comic panel had to be able to function not just as one in a series, but – potentially – as the first panel encountered by a reader. It was necessary, therefore, to avoid relying on other panels in the series when formatting each panel's story. It had to be the case that one would be able to understand the explanation of the dyke 'as it survives at Buckingham Road' on its own, without necessarily having read previously the explanation of the dyke 'as it might originally have been' from panel 1.

Comics are a constructive medium, with information being assembled by the reader from constituent elements. Such complications can be thought of as being addressed not all at once, in one image, definitively – but in the form of a networked answer, spread across multiple images, connected in multiple ways via hyperlinks, and joined together in a process in which the readers themselves are participants. The decision to replace a 'reconstructed' dyke with one indicated by dashed lines is simply one of the ways in which comics can bring into play, for different reasons, different ways of visualising time. More, it is possible to represent within a single image a complex multiplicity of temporalities. In this panel, the dashed lines represent both where the labelled bank and ditch of the earthwork 'was then' in the early medieval period, and where it 'is now' in 2021. In panel 7, however, the dashed lines represent both where the dyke 'was then' in the early medieval period, as well as 'was then' in the late eleventh/early twelfth centuries, and 'is now' in 2021. At the same time as the artwork represents the Dyke as it 'is now' in the later medieval period. While in analysis, this can come across as confusing, in the panel, that complexity – while no less sophisticated – is rendered as self-evident and intuitive.⁸

⁷ Email, HW to JS, 18 May 2021.

⁸ Again, one of the reasons that Swogger has grown to love comics for archaeological communication: it simultaneously facilitates and leverages reader comprehension rather than relying on prior knowledge.

This temporal diversity also characterises the work as a whole. For a comic subtitled *Wat's Dyke* (the medieval monument) *in* (present-day) *Wrexham*, fully 50% of the panels feature neither the early medieval period nor the present day. Instead, following the route of Wat's Dyke through the town takes readers to the later medieval period, the Georgian, Victorian and Edwardian periods, and the twenty-first century. And yet, it is made clear that the story of the earthwork in all these other time periods is, indeed, the story of the medieval monument in present day Wrexham. It was the authors' original intention to create a comic which would, beyond the estimated early medieval origins of the monument 'introduce audiences to the rest of the history of Wrexham: Wat's Dyke providing a literal and metaphorical thread to follow through the town's story.' (Swogger and Williams 2020: 201). It is the constructive nature of the medium, and its ability to represent in a single image a palimpsest of temporalities, which makes telling that kind of a story possible.

Re-writing text

The final element missing from the original rough draft, but there in the final presentation of the panel is the text. Originally, when the aim of the project was to create a leaflet-map, this text would have been presented within the panels as a series of captions, labels and direct speech spoken by the researcher-narrator. In the shift to an online format, some of this text ended up outside the panel. Lacking the funding to create a stand-alone app, and bearing in mind that the project was still considered in many ways a 'pilot' (Swogger and Williams 2020: 201), it was decided that the comics would be hosted online as pages on the Wordpress site of the Offa's Dyke Collaboratory. This meant that audiences might access the comic via any number of digital devices: phones, tablets or large desktop computers. As a consequence, the text resolution within the image could not be specified, meaning that text sufficiently large to read on a large desktop computer wouldn't necessarily be readable on a phone screen. The decision was taken to format the comic with only labels within the panels, and the remainder of the text as essentially an accompanying caption on the webpage.

Once again, this was a decision imposed by the constraints of the pandemic. Had the comic been intended as a digital app from the beginning, presentation of text and image would have been done quite differently. But, that aside, the consequence of this decision was two-fold: first, there was an opportunity to include more text with each image as both were not competing for the same space within the panel, and second, the text was now juxtaposed with the image in slightly different ways. This also had knock-on ramifications regarding the cost of Welsh translation.

Compare, for instance, the original draft of the text written by Williams *before* the image was redesigned:

People live and learn on Wat's Dyke!

The early medieval monument is now part of Wrexham's northern suburbs when Garden Village was built in the 1930s. Today, you can follow it in the fence lines south of Ty Gwyn Lane and west of Wats Dyke Way. At the top of the hill, it divides the Garden Village Playing Field and Wat's Dyke Primary School.

Dropping downhill, it survives under the property boundaries at the back of Buckingham Road before being lost beneath houses closer to Wrexham town.⁹

With the text revised by Swogger as it accompanied the second rough draft (significant changes highlighted):

People live and learn on Wat's Dyke!

Here, the dyke was incorporated into Wrexham's northern suburbs when the Garden Village was built in the 1930s. You can follow it in the fence lines of the gardens south of Ty Gwyn Lane and west of Wat's Dyke Way. At the top of the hill, it separates the Garden Village Playing Field from Wat's Dyke Primary School.

Heading downhill, the dyke then survives under the property boundaries at the back of Buckingham Road before being lost beneath houses closer to Wrexham town.

*These boundaries remind us that Wat's Dyke was originally built as part of the frontier between the early medieval Welsh kingdoms to the west and the territories of the Kingdom of Mercia to the east.*¹⁰

The text was subsequently amended by Williams and ultimately as published:

People live and learn on Wat's Dyke!

Wat's Dyke was incorporated into Wrexham's northern suburbs when Garden Village was built in the 1930s. You can follow it in the fence lines of the gardens south of Ty Gwyn Lane and west of Wats Dyke Way. At the top of the hill it separates the Garden Village Playing Field from Wat's Dyke Primary School.

Heading downhill, the dyke then survives under property boundaries at the back of Buckingham Road before being lost beneath houses closer to Wrexham town. *Here we see the bank of the Dyke surviving in the slope from an alley running from Buckingham Road.*

⁹ Email, HW to JS, 22 April 2021

¹⁰ Email, JS to HW, 18 April 2021

These boundaries remind us that Wat's Dyke was likely originally part of the frontier between early medieval Welsh kingdoms to the west and the territories of the Kingdom of Mercia to the east.

The alterations are subtle, but significant. The authors' addition of the final paragraph provides the physical description of the location of the section in Williams' original version of the text with explanatory context – the sort of text that the researcher-as-narrator usually supplies, and which in this case refers back to the imagery in panel 1. Williams' addition to the close of the second paragraph in the published version restates the connection between the visual explanation and its specific location. In both cases, the refinements to the text make up for the presentational deficiencies of this *not* being a 'proper' comic. In other words, if this panel had been presented within a comic book, an inset map would have been sufficient to visually clarify the specifics of the location, and the researcher-as-narrator character present within the panel would have spoken the contextualised explanation of the dyke as a frontier. The accompanying text – while in no way 'bad' – essentially compensates for the lack of comics-based elements which, for various reasons, could not be included in this particular format.¹¹

Who does what?

Implicit in the above analysis is evidence of the fungible nature of the roles played by both authors at various times in the process. This paper, for example, integrates reworkings of ideas and material provisionally published by the authors (Swogger and Williams 2020), a draft by Williams, significant and extensive additional material by Swogger, then reviews and additions by both. A collaboration as co-authors is based on both having fairly well-defined roles at each stage in the process: writer, reviewer, discussant. By contrast, each comic panel – image and text – was created in a much more entangled way, in which the boundaries between roles were often somewhat indistinct. And while that closer collaboration was constrained, certainly, by the social distancing of the pandemic and interrupted by the day-to-day disruptions – personal and professional – that accompanied lockdowns, it was nevertheless quite unlike the collaboration involved in this paper. In the production of the comic, although nominally defined by speciality and experience, the roles of writer, artist, consultant and editor were, in actuality, quite fluid.

As much as one of us focused on drawing or writing, the other was involved in crucial commentary, critique and alteration. It is only by following the chain of emails closely that it can be determined who contributed what to both text and final artwork. Williams, though claiming to be no artist himself, supplied sketches and photographs that often defined specific elements of each panel. For panel 1, an initial drawing by Williams (Figure 3) was not simply the starting point for the final artwork, but was, in sketch form, its final appearance. By contrast,

¹¹ In many respects, this illustrates precisely why Swogger became interested in comics as a communication medium for archaeology in the first place.

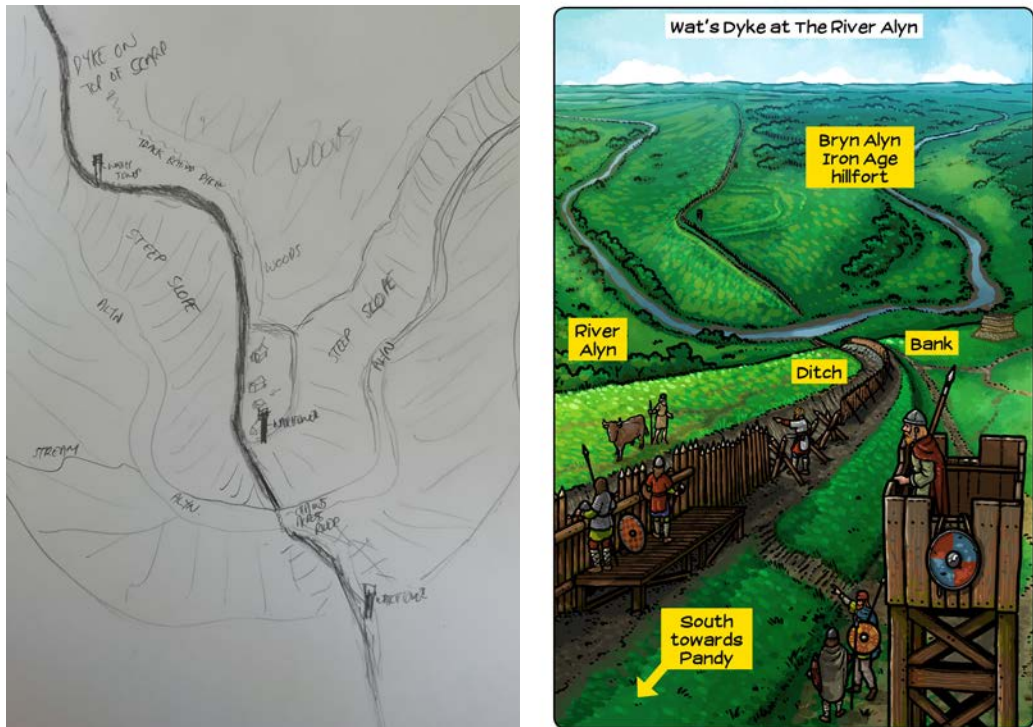


Figure 3: (a) preliminary sketch for panel 1 by Howard Williams and (b) the final image by John Swogger.

however, there were some instances where the development of the artwork proceeded entirely counter to Williams' initial expectations, as with panel 7, for example.

...this isn't the perspective I'd thought you'd take but in doing so it does so much more – the overlap potential with 6 is great! River and Black Brook joining it allows the confluence to be clear and parallel to panel 1 to be evident. Overall, the aerial view complements panel 1 and shows the 2 main river crossings in this stretch.¹²

The points of view chosen for panel 6 and panel 7 (the first a view looking directly at Court Wood, the second a view looking down over the confluence of the River Clywedog and Black Brook) were both inspired by Williams' sketches (Figures 4a and 5a), not because those sketches represented, in rough form, the final artwork (as with panel 1), but because they facilitated discussion about the impact on readers of facing the dyke from a particular compass direction in terms of shaping an impression about the nature of the monument's story at the particular location.

It is important to note that Williams' visualisation of the initial concept was effective even if not necessarily aesthetically polished or highly detailed. Visualisation as an

¹² Email, HW to JS, 22 April.

intra-disciplinary communications tool receives little attention because such ‘sketches’ are considered too rough or crude to be worthy of formal attention (Causey 2017: 44). But these initial drawings perform an important function: quickly and efficiently focusing discussion on key visual concepts at the primary stage of discussion – what Bernd Heinrich describes as a fieldwork practice that helps a researcher ‘extract the signal from the overwhelming noise’ of data (Heinrich 2011: 45). Visualisations at this stage, ‘even if they are really crude and rough’ demonstrate clarity of vision (cf. Keller 2011: 164), setting up an immediate hierarchy of visual priorities that guides onward discussion. In Williams’ initial sketch for panel 7 (Figure 5a), for example, it was clear that to show the dyke as a solid barrier at this point was important – even if, as ultimately was the case, this point of view and its accompanying contextual and aesthetic impact was transferred to the narrative of panel 6. As perhaps suits the comics medium, the two rough drafts for these panels emerged from an interplay of ideas expressed in words (emails) and images (sketches) (Figures 4b and 5b).

As with any other process of comic-making, sometimes the images proceed from the text, and sometimes it’s the other way around; sometimes alterations to the artwork impact the text, and sometimes it’s the other way around. Williams’ published photographs of the Buckingham Road alley, his notes about the presence of dog-walkers, further observations about the direction and nature of the slope-defining arrows, and the text in various labels contributed as significantly to the final artwork in the same way as my final paragraph did to the text: artist-as-writer and writer-as-artist.

Williams’ active role as public archaeologist allowed the project to access ‘real-time’ feedback on disability and access which, as previously noted, shaped not just the artwork, but structured elements of its informational content. The importance of this role is also evidenced in the artwork for panel 6 ‘Wat’s Dyke at Court Wood’, where Twitter users’ comments and queries resulted in significant alterations to its details.

... the rim ought to be stitched, if organic, or if metal, thinner and held on with riveted clips rather than nailed directly [...] [and a] re-enactor queries use of a brooch for the cloak thinking of the lack of them from furnished graves, but I’m happy to go with it since we do have 8th/9th-century disc brooches that needn’t be all female-used.¹³

chap on horse is wearing a narrowseax. By c8th it should probably be a heavy or atypical broadseax, or an early (non-broken-back) longseax. Arrangement of sheath is mostly correct, but the folded back (lowermost) should bend upwards at the tip, so the seam-line (with the metal fittings) is straight rather than curving.¹⁴

¹³ Email, HW to JS, 26 June 2021.

¹⁴ Email, HW to JS, 26 June 2021.

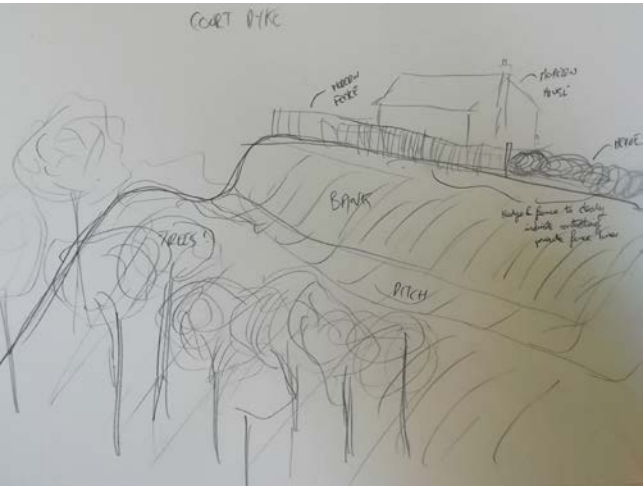
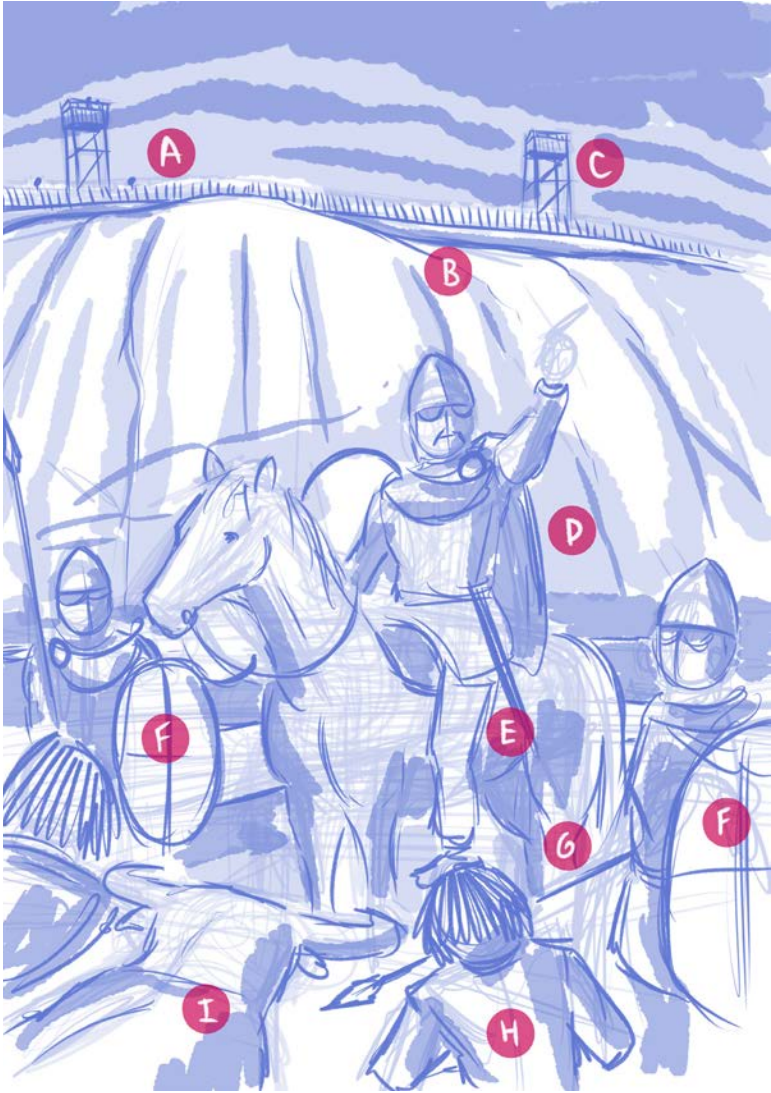


Figure 4: (a) (left) preliminary sketch for panel 6 by Howard Williams and (b) (below) the draft by John Swogger



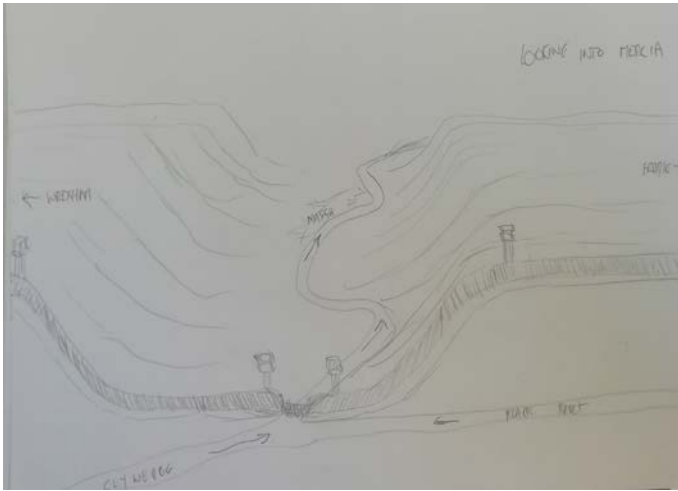
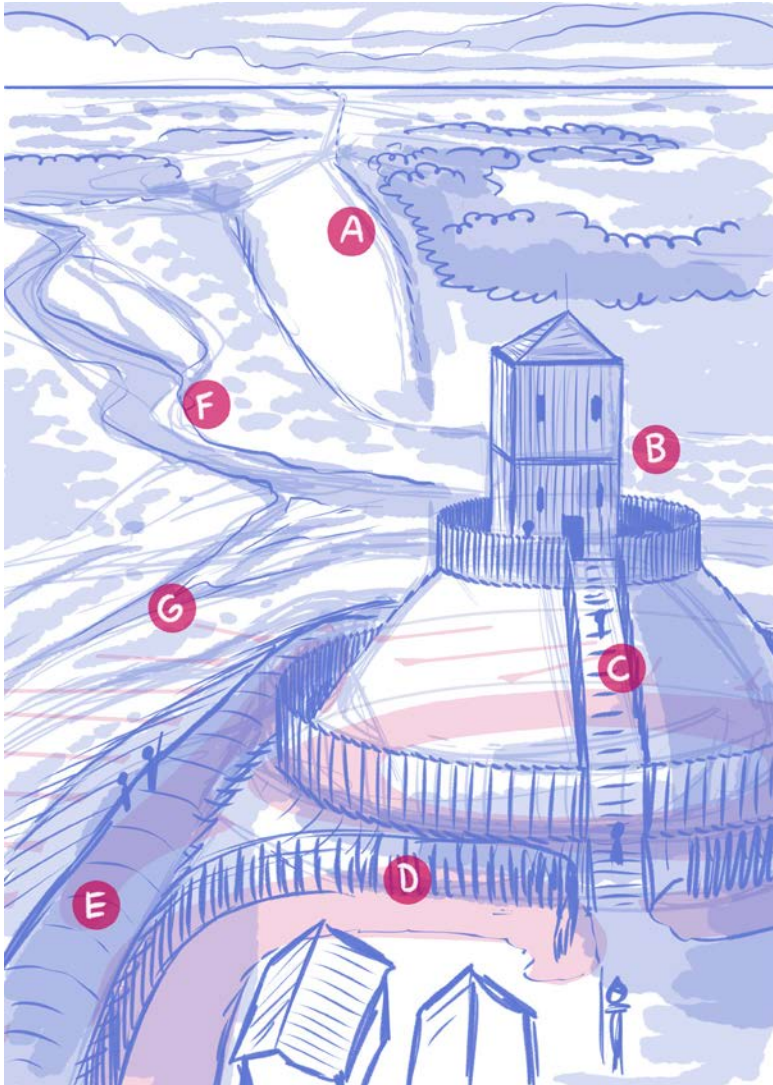


Figure 5: (a) (left) preliminary sketch for panel 7 by Howard Williams and (b) (below) the draft by John Swogger



While receiving and processing expert commentary of this kind is usual in the course of creating any archaeological reconstruction, regardless of style or medium, the fact that such comments affected not just the look of the artwork but the narrative within is significant. Comments from various castle experts on the Norman motte-and-bailey castle in Panel 7 'Wat's Dyke at Erddig Castle' began with observation on structural details.

Someone asked whether there should be a ladder to over-gate platforms.
Not essential.

Wall-walk inside the bailey and motte-top palisades? If too complicated, ignore.

Someone said: 'cram in more buildings in the bailey as per Hen Domen – up to you, but maybe add the edge of a third building to the far-bottom-right?

Motte looks too steep (it is fine as is of course, this is a common concern because folks are used to seeing them eroded).

Water in moat ditches? I'm not at all sure about this given the well-drained and promontory location. Maybe stakes and bushes? Or just leave as is and we can put it down to seasonal pooling.¹⁵

Many of these comments did, in fact, result in changes to the artwork. But the comments also led to suggestions about how the image should be *described*, as well as drawn:

One person says there should be a confluence of rivers. You show this already but they claim not to have seen it. Solution: (i) can you make the water a deeper blue for the rivers so that it is more clearly differentiated from the snow? (ii) can you replace 'South to Big Wood' with 'Black Brook' to annotate that stream and put 'South to Big Wood maybe inside the bailey?'¹⁶

Still others moved on from mere visual detail to comments which suggested how the *narrative* of the image might be structured:

You've got the palisades round the top of the motte, which is (as far as anything is) fairly standard in this sort of the castle. I like the little gate house, the tower seems reasonable and you've got buildings in the bailey. This might seem daft, but do you have space for a horse? Once your rooftop sentinel has spotted something, then the messenger must ride forth. It also helps underline the interconnectedness of sites and landscape.¹⁷

¹⁵ Email, HW to JS, 27 June 2021.

¹⁶ Email, HW to JS, 27 June 2021.

¹⁷ Email, HW to JS, 27 June 2021.

In other words, in the same way that the inclusion of the dog-walker, cyclists and woman on a mobility scooter in panel 3 helped communicate meta-information about accessibility along that section of the dyke, so too was this commentator suggesting that the inclusion of a man and a horse would say something about the nature of Norman border-control policy. He was quite right to say so, and a horse and rider was duly included. But significantly, this comment also altered the accompanying text, with the following paragraph added by Williams after the changes were made to the artwork:

Despite being constructions for contrasting times and built centuries apart, both Wat's Dyke and Erddig Castle made use of the topography to control and dominate the Anglo-Welsh borderland. Are they both stages in the colonisation of the landscape: first by the Mercians, later by the Normans? (Williams and Swogger 2021a: panel 7, 2021b: 18)

So, who *did* write this comic? Who *did* draw it? In a very real sense, the back-and-forth nature of the collaborative dynamics made it easy to include material from a wide range of contributors, both expert and otherwise. Critically, it makes it easy to extend the notion of authorship to include not only *academic* experts, but those whose expertise is no less significant, yet traditionally 'othered' by academic control over archaeological outreach: re-enactors, gamers, school-teachers. Comics can facilitate a dispersed authorship drawing on community-based as well as scholarly knowledge (Swogger forthcoming), braiding them together so that roles are swapped, overlapped and re-prioritised as the work requires. With such a fluidity of approach, it becomes easy for the writer to influence the artwork, the artist to rework the text, and the reader to alter the story.

Potential and possibilities

To date,¹⁸ the comic introduction and pdf have been viewed over 740 times and individual comic pages between 35 and 60 views each, while the YouTube video has received 281 views. Positive feedback has been received from various academics and local people but we have deferred structured feedback until after the COVID-19 lockdowns and ongoing pandemic-related restrictions have concluded. From experience with the *Oswestry Heritage Comics* project (Swogger 2019b) we anticipate the best feedback will come from face-to-face discussions with local groups and individuals when we can facilitate structured use of, and feedback on, the comics with local communities and stakeholders.

In our preliminary discussion (Swogger and Williams 2020), we identified the potential for building on this initiative through an animation project and reflected on the wider applicability of this medium for embedding in research processes and community cocreation as well as disseminating the results. This has implications across disciplines for the study of linear monuments which are especially challenge to apprehend within

¹⁸ 4 November 2021.

individual locales due to vagaries of survival and development. Indeed, specifically for linear structures, the potential is there for dialogues and synergies between monuments across the globe and very different periods of the human past using the comic medium.

So, *What's Wat's Dyke?* can only be considered as a pilot exercise. The course of Wat's Dyke as it passes through Wrexham represents only about a third of the monument's length and perhaps not even that of its story. The northern section of Wat's Dyke to Basingwerk and the southern extent to the River Morda could equally be the subject of a comic project. Even within the Wrexham section, where at least fifteen sections of the dyke surviving under different circumstances (Swogger and Williams 2020: 197, fig. 1), the comic only covered ten of those locations. Even within these ten locations, there were many aspects of the monument's story that could not, for reasons of space, be covered. There have also been funding and practical constraints on what could or could not be included within the current project. But, as indicated, there may be opportunities to expand the trail at some point. We are grateful for the funding provided by the Offa's Dyke Association for the development of a print booklet based on the comic – but regret that it isn't possible at present to elide its publication with an outreach programme at Wat's Dyke Primary School, for example. Similarly, we are fortunate that the Offa's Dyke Collaboratory website was available to host the online Welsh and English versions of the trail although we regret that funding is not available to translate this digital presentation into a fully functional app. A larger-scale digital version of this comic as an app might include not just more locations on the map, but more links from each panel in order to pick out overarching themes or other discussion points; even opportunities to discuss how the comic was written and drawn.¹⁹

However, one would like to think that such unfulfilled ambitions simply suggest the potential for development of the approach and future projects. In this regard, we see not only potential for taking the comic heritage trail and applying it to other sections of Wat's Dyke, Offa's Dyke and the 'short dykes' of the Welsh Marches, but also to a host of other linear heritage monuments: tracks, ridgeways, roads, rivers, canals, tramways, railways. The power of this approach is that it can transcend dominant divisions, such as county and national boundaries, creating connections and building bridges over both time and space. Hence, there are many archaeological sites and monuments which seem impervious to attempts to raise their profile, communicate their importance or argue for their significance. It is sometimes assumed, contrary to the evidence of continuity in local memory (Lloyd Jones and Gale 2020), that such monuments are inherently lacking in some way – they are too difficult to see, too difficult to understand or too difficult to relate to, and that it is this inherent deficiency which impedes public engagement. It could also, however, be that the approach and media chosen for outreach are simply not suited to those monuments' interpretative and narrative requirements.

¹⁹ An opportunity to explore a truly non-linear, 'Choose Your Own Adventure'-style exploration of an ancient monument and its physical and intellectual landscape through an application of McCloud's concept of an 'infinite canvas' of comics panels linked not by a left-right reading order, but by interactive decisions made by readers (McCloud 1993: 205 and 2000: 200ff).

For example, what interpretative or narrative ‘needs’ might a barely-visible early mediaeval moated site on an obscure section of rural footpath have? The real story might not necessarily be about the Middle Ages, but why the site was not ploughed away in the eighteenth century, why the nineteenth century road bends around it, and how it ended up colonised by rare newts and irises after the Second World War. The story of a site like this might need to be told in reference to the wider agricultural community, with the moated site a constant throughout its shifting social history, economic fortunes and changing climate. As with Wat’s Dyke, in reframing a monument as being of a particular place rather than of a particular period, it might be easier for an audience to see the mediaeval monument through the perspective of Victorian reuse and in doing so, discover new relevance for previously neglected heritage (panel 5). Visualising an overlooked archaeological monument as local (panel 4) connected to historical community figures (panel 5) and better-known places (panel 8), existing and aspirational activities (panels 9 and 10) or within every-day, domestic contexts (panel 3) can help ground the unfamiliar (panel 6) or the unexpected (panel 7) and make sense of otherwise incomprehensible humps and bumps in fields and waste-ground (panels 1 and 2).

Williams (2020a) has demonstrated how, despite a variety of approaches, media and materials, public-facing interpretation of Wat’s Dyke has largely failed both the monument and its complex story. Outreach for archaeology which is difficult to see, difficult to understand or difficult to relate to must first help its audiences to see, understand and relate before it tries to explain. Outreach for monuments which are fragmented, which exist as historical artefacts in multiple periods and which mean different things to different past peoples must help audiences untangle and connect not just across space but through time as well. It is not possible to tell *the* story of Wat’s Dyke, because that story changes every half mile. Making sense of eighty different stories along the whole length of the dyke requires a medium that can build coherence out of unrelated fragments; perhaps it isn’t possible to tell the story of Wat’s Dyke effectively through any medium other than comics. If the story of Wat’s Dyke is actually the story of how a medieval monument is also a Norman monument, a Georgian monument, a Victorian monument, a modern monument, then perhaps the story of *What’s Wat’s Dyke?* is the story of how the nature of the monument guides us to a series of interleaving stories. These are not just stories about Mercian military aspirations and political hegemony – stories of ethnic division and political power and authority – but also stories of the inheritors of the monument within contrasting and changing socio-economic and cultural environments. This is as much about celebrating the military redundancy and the fleeting socio-political significance of the early medieval monument, as it involves delving into Wat’s Dyke’s many afterlives in which its significance is remembered, forgotten and repeatedly reinvented.

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