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Fragmenting, filling and forgetting: the making of a post-industrial landscape

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ABSTRACT

While post-industrial landscapes are often characterised as products of their histories, in this article, our goal is to understand and depict them as unfolding processes as much as formed places. The article focuses on an area of the South Wales coalfield, Onllwyn in the Dulais Valley, once transformed by extensive mining activities from the early nineteenth century. Employing a relational and processual approach, we explore the gradual making of a post-industrial landscape from the mid-twentieth century. We identify three key processes - fragmenting, filling, and forgetting - that have characterised this emergence from the industrial past, each of which has been shaped by intertwined socio-cultural, economic, environmental, and material factors. While these processes take distinct and localised forms, we argue that they are relevant for post-industrial landscape studies more broadly, shedding light on how such landscapes form, as on the wider dynamics of decline, renewal and change.

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Post-industrial landscape; change; relational; process; Onllwyn; South Wales coalfield

Introduction

Post-industrial landscapes have received significant conceptual attention in landscape, industrial archaeology and urban studies in recent decades. Often, landscape is interpreted as an accumulated outcome or product of change. This is a prevailing tendency - whether the landscape is characterised as a 'wasteland' or a 'scar', assigned value as heritage, or recognised as a product of time as in 'palimpsests' traces or layers (Bartolini, 2014; Berger, 2019; Gardner, 2024; Storm, 2014). In this article, contrastingly, we seek to contribute to understanding post-industrial landscapes as dynamic processes articulated by unfolding relations between the economy, people, physical place and between different temporalities.

We explore the gradual making of a post-industrial landscape in South Wales, UK, in the post-war period. The South Wales coalfield extends over a broad, hilly area of around 2,500 km squared (Merrill & Kitson, 2017). It is characterised by a series of deep valleys that spread out from the ridges of the Brecon Beacons towards the Welsh south coast. Our specific focus is on one small piece of this complex topography - Onllwyn, an area within the Dulais Valley encompassing three small settlements and the hybrid landscape they are set within.

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Both authors contributed equally to the development of this paper at all stages.

Coal was mined in South Wales from as early as Roman times. From then until the nineteenth century, mining occurred on a small scale (Evans, 1977). Extraction escalated rapidly with the onset of the Industrial Revolution. By the apex of coal production in 1914, one-fifth of all British coal was extracted in Wales, fuelling not just engines and factories but Britain's economy and imperial expansion overseas (Benson, 1993). Settlements and villages sprang up all over the region to house the required labour force, typically snaking along the valley floors and the lower slopes of hills. In the Dulais Valley, the predominant type of coal extracted was anthracite, the highest grade exported across Europe and the wider world.

The industry was crisis-prone throughout the nineteenth and early twentieth centuries, expanding rapidly yet also struggling to keep pace with technological advances and increasingly facing competition from overseas. Post-World War II, a combination of technological, economic, geopolitical and social changes led to a prolonged yet decisive decline (Curtis, 2013, p. 47). Mines that were still primarily reliant on human labour closed between the 1960s and the end of the 1984-85 Miners' Strike under Margaret Thatcher's Conservative government. Landscapes that had been tunnelled and excavated, worked and reworked intensively, fell still with profound consequences for local economies and ways of life. Head gears came crashing to the ground. Pit head baths and other colliery buildings fell in disuse and were demolished. Slag heaps that had grown inexorably stopped rising and began to be reshaped. The mouths of tunnels running deep through geological layers were stoppered up and filled. Populations shrank rapidly due to a lack of employment, a loss of social infrastructure, and an absence of further development opportunities. Yet, even as this post-industrialisation of place and culture related to underground mining unfolded, in the Onllwyn area and elsewhere in the Dulais Valley, new, highly mechanised forms of open-cast mining developed alongside, continuing well into the twenty-first century.

Our exploration of Onllwyn has combined literature review to situate our study in a broader context of post-industrial landscape research and historical, spatial and social research. We begin by delving more deeply into broad literature regarding the characteristics of post-industrial landscapes and by clarifying the relational, processual approach we have taken to studying the landscape in emergence. The second section describes our research methods, focusing on the integration of various information sources, ways of knowing and forms of evidence. The third provides a brief contextual overview of the Onllwyn industrial landscape's development in the nineteenth and early twentieth centuries. In the discussion (Section 4.0), we conceptualise the making of the post-industrial landscape as three processes - 'fragmenting', 'filling', and 'forgetting'. These, we argue, are key to understanding Onllwyn's story as a place since the 1960s, but they also shed light on how a post-industrial landscape forms more widely. We conclude by arguing for the relevance of these understandings to practitioners and policymakers approaching post-industrial places as contexts for regeneration.

Approaching the post-industrial landscape

Over the last few decades, literature seeking to describe and conceptualise post-industrial urban or regional landscapes has grown significantly (Gospodini, 2006; Hill, 2013; Hoefer & Vicenzotti, 2013; Keil, 2005; Keulartz, 2013; Kirkwood, 2001; Langhorst & Bolton, 2017; Ling et al., 2007; Loures et al., 2011; Storm, 2014; Vaccaro, 2010). Today, that literature encompasses former industrial landscapes from across the globe.

Consistent across all such works is the notion of post-industrialisation, which broadly denotes the decline of economic activity centred on manufacturing at urban, regional and national levels (Bell, 2004; Gibson, 1993; Heilbroner, 1991). The term post-industrial was first employed by the American sociologist Daniel Bell in 'The Coming of Post-Industrial Society: A Venture in Social Forecasting' (Bell, 1973). Bell was writing at a time of economic change in the US, when industries like steel, automotive, and coal went into decline due to increasing foreign competition, energy crisis, and the rise of new manufacturing technologies, along with social and political

change. Accompanying a decline in manufacturing, he anticipated, would be profound shifts in the labour force and the nature of work, the demand for and nature of knowledge, patterns of consumption, and the emergence of new economic sectors and forms of expertise. As many other scholars have shown over the decades, these shifts have played out in many respects as anticipated, through the rise of the services sector, the knowledge economy and information technology (Gibson, 1993; Heilbroner, 1991, p. 54).

Literature on post-industrial landscapes is typically concerned with the effects of the shifting economy on place. It documents the sites and spaces that supported former industrial production, including both cityscapes (Gospodini, 2006) and peri-urban areas such as the South Wales coalfield (Hill, 2013; Langhorst & Bolton, 2017). It charts industrial legacies and the effects of decline on these sites and spaces – from quarrying or mining traces, forms of abandonment, to the persistence of toxicities and environmental hazards over time. It also charts the aftermaths of these sites and spaces through transformations that are just as extensive as the industrialisation that produced these landscapes. These transformations range from gradual ruination to comprehensive redevelopment of the venue for employment, education and consumption (Kirkwood, [2001] 2011). They consist of varied political, planning, design and participatory activities that have served to reimagine, repurpose, remediate, and remake them (Braae, 2015; Heeney, 2017; Hoefer & Vicenzotti, 2013).

Across the literature, different conceptual approaches to post-industrial landscape are apparent. A common interpretation of landscape's transformative quality is through the lens of palimpsest (Bartolini, 2014), a term used as a metaphor to describe the layering effect of transformation in cities and landscapes where the past remains discernible through the contemporary structure, usage and form of a place. It has been employed as a compelling way to describe both the overwriting of industrial history by post-industrial development and how 'traces of the past [remain] still very much there in the community's identity and culture' (Linkon, 2025, p. 25). The interpretation has nonetheless been problematised by some, such as Bartolini (2014) and Storm (2014), who highlight the potential to characterise these changing relationships in alternative terms – such as sudden juxtaposition, entanglement, imbrications of material histories, gaps and erasure, and ongoing transformation (Bartolini, 2014; Storm, 2014). As Storm (2014, p. 3) puts it, 'the palimpsest is misleading if one wants to emphasise the interconnectedness, the linked relevance, between the different layers' which coexist interdependently.

Another common approach is to identify and critically engage with characterisations of post-industrial landscapes. One such characterisation, as Jonathan Gardner (2024, p. 1) argues, is the 'wasteland,' often used to describe post-industrial sites that have experienced 'dereliction, pollution, or poverty.' Through his analysis, he shows how uses of a 'wasteland' narrative can serve a political purpose in regeneration, pointing to the need for 'clean-up' through comprehensive redevelopments that often lead to traumatic ruptures with the past and detrimental impacts for former industrial communities, their lived spaces and collective memories. Related notions used to characterise post-industrial landscapes, also typically in negative terms, include 'brownfield' land, 'edgeland', 'scabs', 'shadowed grounds' (Storm, 2014), 'sacrifice zones' (Sanz & Rodríguez-Labajos, 2023), and 'outbacks' (McSweeney & McChesney, 2004). All these notions serve to conceptualise post-industrial places in terms of processes of marginalisation, wasting and damage.

Offering a contrasting perspective, in the book 'Post-industrial Landscape Scars', Anna Storm (2014, p. 1) avoids generalised negative associations while recognising the painful marking of the industrial landscape. She avoids simplistic accounts of change, foregrounding the complexity of transformative processes. The post-industrial 'scar', in her analysis, is the outcome of symbiotic processes of 'wounding' and 'healing' (Storm, 2014, pp. 4–5). Wounding is seen to occur to landscapes over successive stages, typically first through extraction and exploitation, but then through decline, erasure and abandonment. Healing happens, conversely, through processes including repair, fading away, rewilding and reinterpretations that can have physical, human, more than human, environmental and biospheric dimensions.

While these processes can unfold linearly, she shows that the scar is not merely the product of layering or accumulation but is the result of 'a multitude of parallel or successive stories and perspectives' (Storm, 2014, p. 10). While the scar is formed through processes that are external to human consciousness, these can also take root within the mind through lived experience (Smith, 1993).

In this article, we draw on these conceptualisations of landscapes as processes, concentrating thus less on *nouns* used to describe a landscape, but rather *verbs* that refer to post-industrialisation in the making. We avoid either perpetuating or correcting any negative constructions or representations of the post-industrial landscape, but rather concentrate on conceptualising the key characteristics of their emergence and unfolding. We recognise that to explore a landscape as a process - as 'inherently dynamic in nature' or as an 'open system' (Wood & Handley, 2001) - is to foreground the complex ways in which transition has occurred, which might include forms of decline such as becoming obsolescent or dysfunctional and acts of creativity and reinvention. It is to recognise the physical and social, spatial, multi-scalar, experiential, mnemonic, and temporal dimensions of lived landscapes as dynamically interrelated but also continually shifting in relation (Stenseke, 2018). It is also to recognise varied links between landscape evolution and the never-settled formation of meanings, attachments and values (Holmes et al., 2022).

Building on this, our analysis is also informed by relational approaches developing in recent landscape research and wider built environment studies that attend to the complex and dynamic relationships between diverse entities, built forms, nature, species, and human communities within a lived landscape (Heindorf et al., 2024; Mitchell, 2017; Qviström, 2023). These approaches typically also encourage a decentring of *a priori* definitions of landscape in favour of understandings of landscapes 'as enacted', be it through landscape analysis or situated interventions in existing landscapes (Qviström, 2023, p. 1109). Such approaches have been used, amongst other things, to foreground relationships between local and regional dynamics in shaping specific places (Mitchell, 2017), to identify how values associated with landscapes form (Stenseke, 2018), and to explore interdependencies between human and more-than-human lives (Cockburn et al., 2020).

For our research, a relational approach helps us surface and depict a post-industrial landscape forming over sixty years as a set of interactions between geology, economic factors, multi-scalar politics, technological change, planning, local people's everyday lives and memories, plants, animals and more. It also helped in handling various types of evidence collected through the research – from photographs and maps to observations to oral accounts of change.

Methods

To chart the post-industrial landscape, we employed a combination of historical, spatial and social research methods. Research began in April 2022 and continued over a calendar year across different seasons and different spaces. Literature relevant to the case study area was assimilated to develop our understanding of mining history, local livelihoods, trade union activities, cultural traditions, and local community in the Onllwyn area, but also to set these phenomena within the context of wider economic and political drivers for post-industrialisation in South Wales and beyond in the post-World War II era.

Archival research involved consulting a wide range of materials, including aerial photographs, documentary photographs, Ordnance Survey (OS) maps, subterranean maps, directories, and newspaper articles, to understand the processes of historical transformation in spatial, material, and social terms. One of the main challenges we encountered was that changes occurred rapidly, and much of the industrial past was erased from the 1960s without record due to the absence of an 'official' heritage status. Archival materials were scattered, fragmented and, even when collected, not always well maintained, stored or labelled. We gradually became aware that there were more materials stored in community archives and people's homes, such as the South Wales Miners' Library branch based in a community-based organisation called the D.O.V.E

Workshop (the Dulais Opportunities for Voluntary Enterprise Workshop) in Banwen and the Cwm Dulais Historical Society.

GIS was used to help spatially chart and interpret the changing relationships in the physical environment, both above and below ground. It was crucial for recognising patterns of change and thus for conceptualising the making of the post-industrial landscape (See Section 4.0).

Social research, in turn, provided the means to understand the making of the post-industrial landscape through an experiential lens, correlating and testing spatial understandings with insight, memory and feeling. We conducted interviews with older residents of the locality who had lived or worked in Onllwyn during the period of transition, aiming to understand the places marked in historical documents and maps and how change had been experienced. Eight in-depth, semi-structured conversations, including a focus group with older people (aged 75–95) from the Onllwyn area, were held between January and March 2023. Through them, it became possible to understand how landscape forms, infrastructures, and buildings were integrated and lived locally and how they subsequently changed. Echoing findings from Amy Walker's research in the Ebbw Fach Valley, we also became aware of entangled perceptions of change and memories of the industrial past, encompassing ambivalent feelings about the post-industrial landscape, including loss and nostalgia (Walker, 2020). Hence, we were able to build up an impression of a four-dimensional landscape of interdependent yet radically distinct parts, from the geological layers of the earth to the cultural practices of everyday life, and from deep time to the ephemerality of the present moment.

Our analytical methods were guided by the conceptual approaches discussed above, specifically involving identifying dynamics and recognising those as the result of the interactions between hybrid entities – from geology to economic factors, multi-scalar politics, technological change and so forth - forming and transforming the (post)industrial landscape of the Onllwyn area. Drawing on the different elements of our research, our themes of 'fragmenting', 'filling', and 'forgetting' discussed below arose inductively to describe what was unfolding within the landscape. We sought to trace the evolution of these dynamics, particularly focusing on the period from the 1960s as post-industrialisation took hold.

The making of Onllwyn

The Onllwyn area forms part of a valley landscape shaped by glaciation and the flow of the Afon (River) Dulais. Running off at an angle from the Vale of Neath, the Dulais Valley lies at the cusp of distinct geological formations, with layers of carboniferous limestone and old red sandstone to the north and siltstones and coals below and to the south. Before the 1820s, Onllwyn was a remote rural, upland area consisting of moorland, rough grazed fields and hillside pasture (often referred to in the Welsh language respectively as 'rhos' and 'ffridd') and patches of woodland between scattered farms (Evans, 1977; Sayce & Martin, 1844).

Driven by the demand for coal in growing industries in South Wales and beyond, large-scale extraction began in the area in the 1820s. A key driver was the expanding iron industry in towns across the region, from Nant-y-glo to Tredegar to Merthyr Tydfil, linked to colonial activity and development across the British Empire, promoting intensive limestone quarrying at the foot of the Brecon Beacons mountain range as well as coal mining in the South Wales Valleys. By the 1840s, the Dulais and Swansea valleys were well established as the 'anthracite district' (The Pembrokeshire Herald & General Advertiser, 1847, p. 2), thereby cementing a pivotal role for the area in Britain's imperial industrial economy while also serving as a site of extraction and exploitation.

There were two main collieries from this time on, known respectively as Onllwyn No.1 (also called 'Onllwyn Pit' or 'Onllwyn Colliery') and Onllwyn No.3 (also called 'Maes-Marchog' Colliery in curious memory of the Roman legion that had once camped on the site) (Figures 1–3). Onllwyn No.1 was located at the heart of the Onllwyn village, while Onllwyn No. 3 was at the location of what became Banwen. By the early twentieth century, underground workings reached

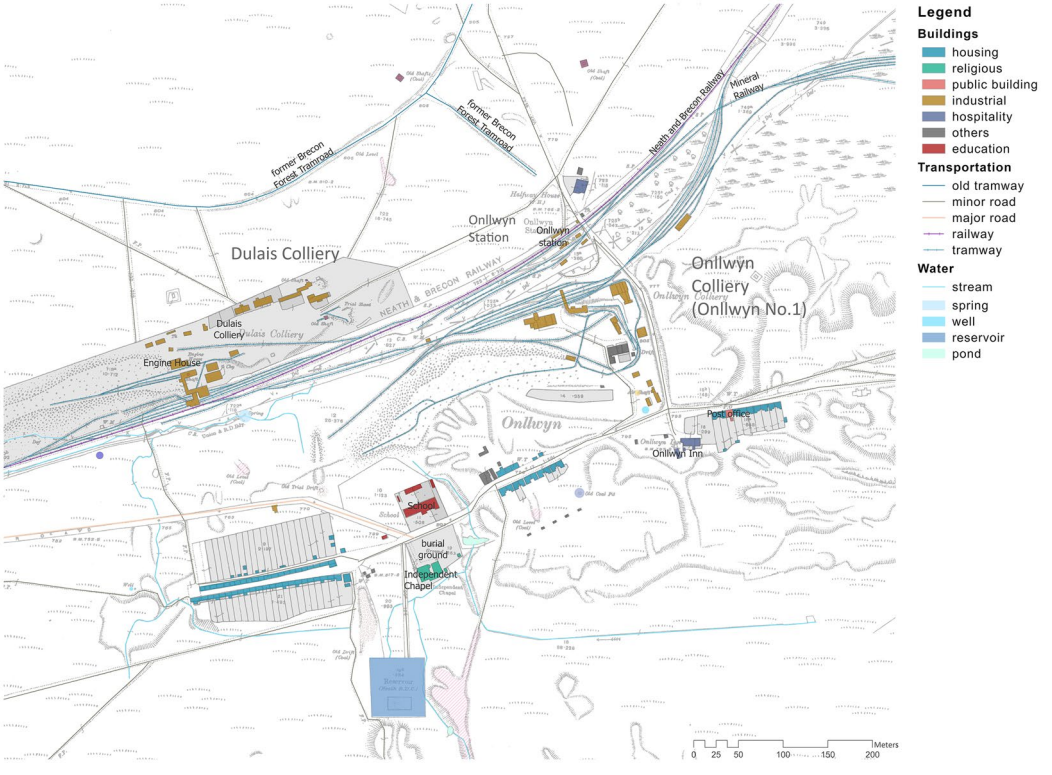

Figure 1. Onllwyn No.1 (Onllwyn Colliery) on the 1914-15 OS Map, (Tam, 2023d), published with permission.

Figure 2. View east from Onllwyn No.1 Colliery tip, c.1960 (Anon., c.1960b), published with permission.

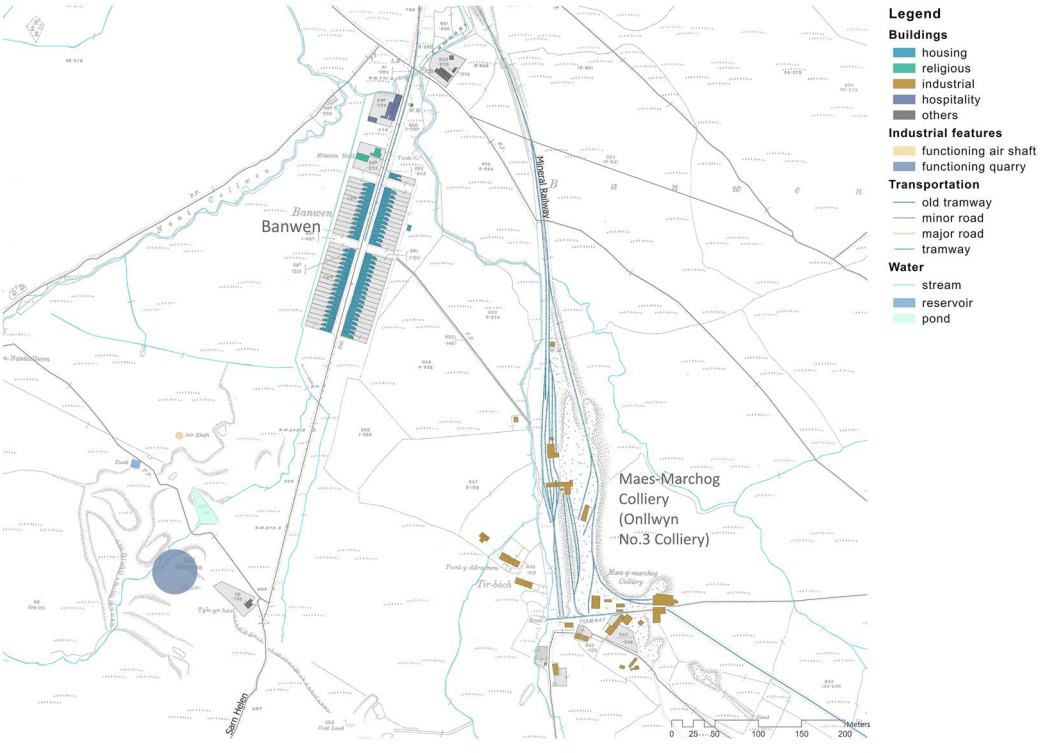

Figure 3. Onllwyn No.3 (Maes-Marchog) Colliery on the 1914-15 OS Map (Tam, 2023e), published with permission.

deep into the various layers of the coal seams through a complex network of shafts, drifts and interconnecting tunnels (Figure 4).

As the mines extended, the landscape above ground was gradually transformed into a curious patchwork of still rural and newly trammelled, industrialised land. Extensive colliery-related buildings developed to manage increasing mining activities (Figures 5 and 6). As the residue of excavated underground material was separated from the coal and set aside, slag tips grew - fat fingers of land rising beside the collieries and around the settlements, gradually engulfing them. Overhead aerial ropeways and gantries ferried slag and coal from the workings onto the tips, producing, as elsewhere across the coal-scape, an increasingly confused geological landscape - wastescapes of the present forged from the materialities of deep time.

The landscape above ground was also divided by the development of necessary transportation infrastructure to transport the coal to markets far and wide. From the Brecon Forest Tramroads in the nineteenth century to the Neath and Brecon Railway, this infrastructure served to connect remote Onllwyn to surrounding regions in the Neath and Swansea Valleys, to the local docks and wharves on the Swansea Canals and River Tawe, the larger ports in Swansea and Neath, and from there to the locations around the world where Welsh coal was eventually combusted and released into the worldwide atmosphere (Hughes, 1990, p. 57).

At a finer scale, the settlement of Onllwyn grew from a single terrace of workers' houses with a school and Independent chapel in the 1840s (Davies, 2004, p. 78; Kelly's Directory of Monmouthshire & South Wales, 1884) to a village of two thousand people, complete with the facilities needed to sustain it and express the cultural distinctiveness of a mining community – from an inn to public houses, post-office, and shops of various kinds. New housing developments emerged in concert with sudden advances in the production of coal in the first decade of the twentieth century. The villages of Dyffryn Cellwen and Banwen emerged between Onllwyn No.1 and No.3 Collieries, and the development of the 'Onllwyn Welfare Ground' led to the production of a local landscape of

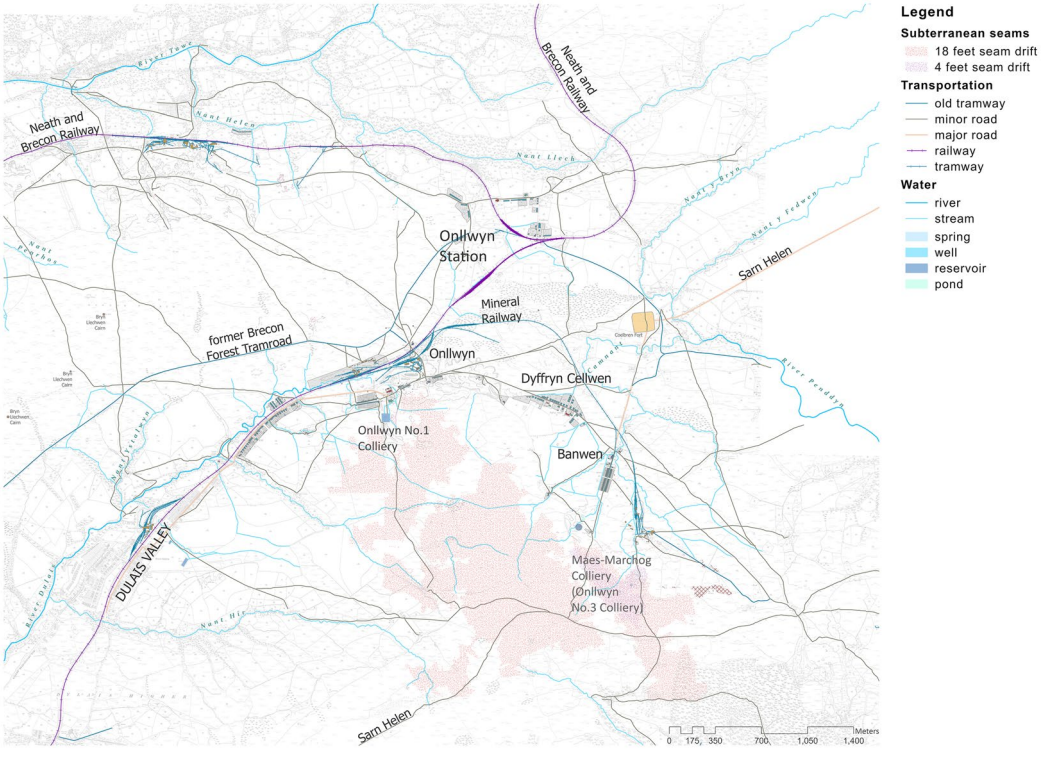

Figure 4. Onllwyn on OS map 1910s-20s (Tam, 2023c), published with permission.

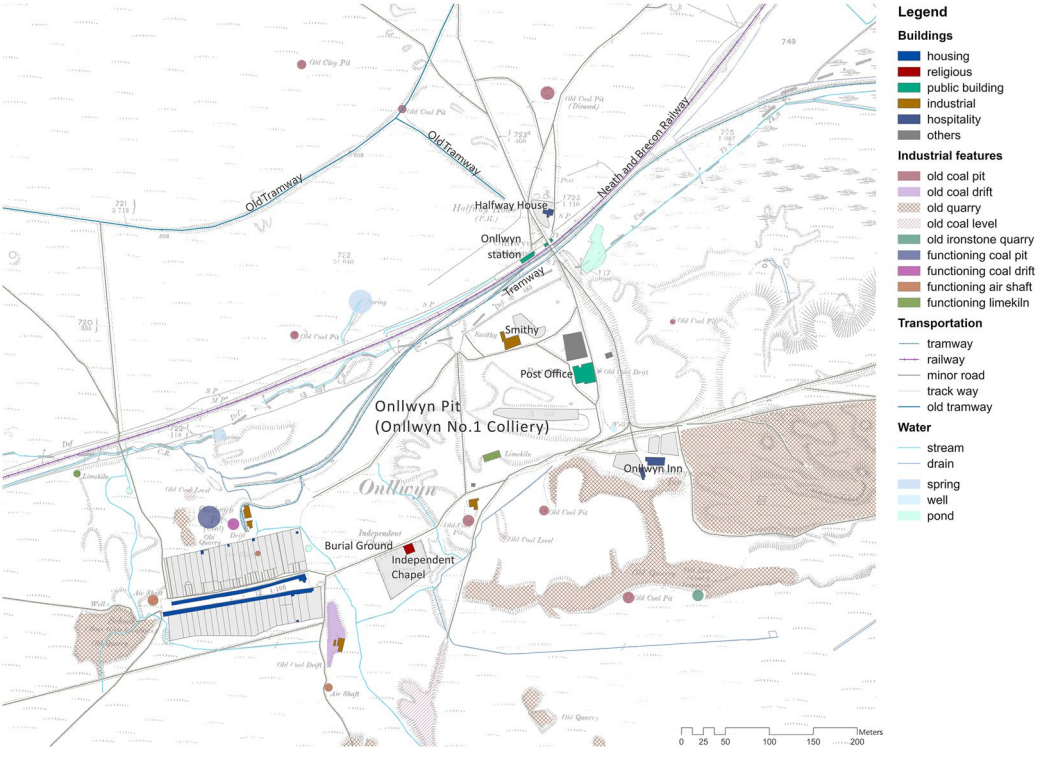

Figure 5. Onllwyn on the 1876 OS Map (purple: railway lines, green: tramroads) (Tam, 2022), published with permission.

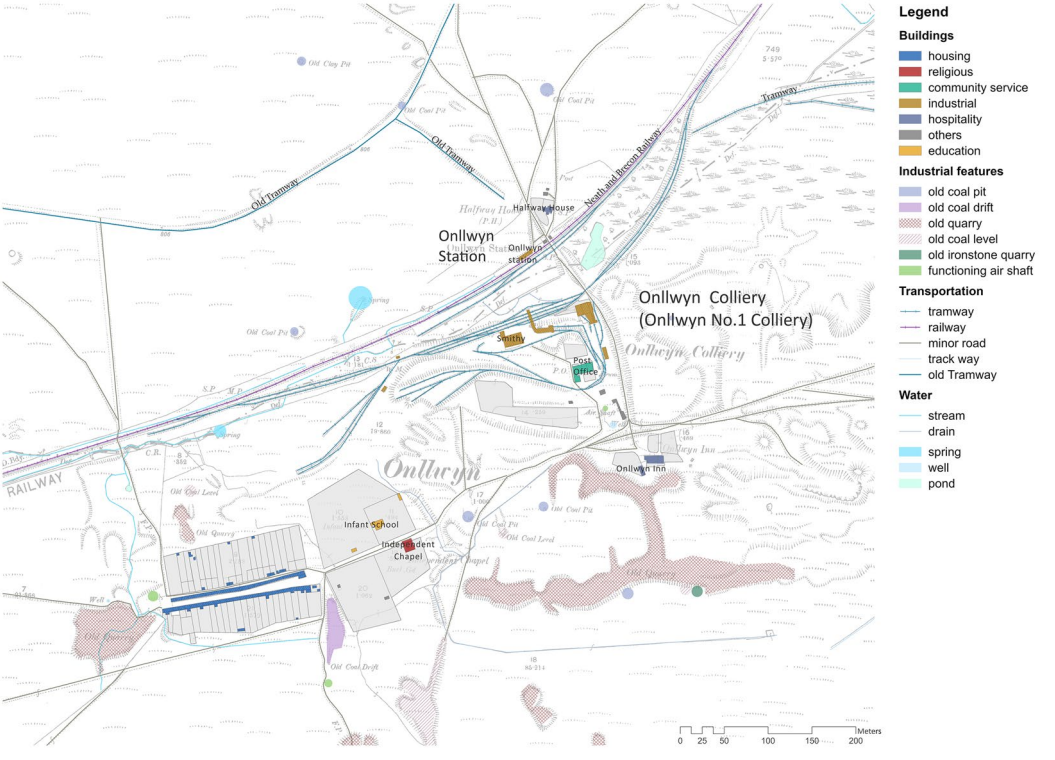

Figure 6. Onllwyn on OS map 1896-97 (purple: railway lines, green: tramroads) (Tam, 2023a), published with permission.

mutual support, solidarity and leisure – including a 'Welfare Hall' for meetings of the Onllwyn Lodge of the National Union of Mineworkers and cultural events, a football field, bowling green, tennis courts, children's playground, paddling pool and cinema (Davis & Tam, 2023).

The coal industry was volatile and frequently impacted by financial crises and global economic downturns, as well as the demand driven by wars. Onllwyn's population began to fall from the 1940s, according to the census. The decline rapidly accelerated in the 1960s. On 3rd February 1962, the Onllwyn No.3 Colliery, which employed around 450 people and had more than 90 pit ponies, closed, soon followed by the closure of Onllwyn No.1. These closures, driven by forces from a structural shift towards liquid fuels to technological change and the decline of the British Empire, created significant ruptures in the ways of life in Onllwyn (Beynon & Hudson, 2024). The following section examines the emerging post-industrial landscape stemming from these processes and their interrelations.

The remaking of Onllwyn

Over the past sixty years, Onllwyn has, at least in terms of ground cover patterns, transformed back into a rural landscape with little villages set amid fields of sheep and horses, open moorlands, woods and scrubby hillsides. The three settlements have reduced in size, and the colliery works have been demolished. Remnants of industrial workings remain, but many are invisible or overgrown, and some are repurposed. The site of Onllwyn No. 3 is now a nature reserve with a pond. A former forge holds pens for ewes and lambs. The site of coal board offices and a pithead bath, is today a nursery, library and community centre.

Within the landscape, different elements have transformed in various ways and at different speeds. A story may be told of slag heaps, another of ruins and a different one again for mines. While the landscape's transformation and associated underground mining culture are generally

a story of decline and disappearance, Onllwyn has been the focus of highly mechanised and invasive forms of open-cast mining since the 1970s, serving to perpetuate the process of resource exploitation. Involving the wholesale removal of vast tracts of land to up to 200 metres in depth, this form of dehumanised extraction created a 'lunar' landscape of 'giant cranes and giant lorries' amid hollowed hills while doing little to support post-industrial settlements with their fading 'stories of solidarity' (Francis, 2018, p. 79).

In this section, we describe three processes that our analysis has led us to identify as key to characterising the changing relations between people, economic activity, and place in the making of Onllwyn's post-industrial landscape – fragmenting, filling, and forgetting. *Fragmenting* refers to more profound and complex processes than ruination, through which connections between people, place, economy and society fell apart and then got partially remade within and through the landscape. *Filling* refers to processes whereby harsh edges, gaps and holes, along with all that they represented historically within the worked landscape, were smoothed over or infilled. Finally, *forgetting* refers to processes of erasure and disappearance that not only manifest within the physical landscape but are felt and interpreted by local people who still hold the industrial past in their hearts and minds.

Fragmenting

If Onllwyn's industrial development led to a local landscape of interrelated geological, topographical, industrial, cultural, infrastructural, ecological and domestic parts, then post-industrialisation as a process has served to fragment that landscape. The closure of Onllwyn No.1 and No.3 Collieries in 1962-64 drove members of a community that worked where they lived to find work in the collieries elsewhere, leading to a concern that Onllwyn would become a 'ghost town' (Mckinnell, 1962, p. 11). Initially, migration was localised, but the mines kept closing as demand for Welsh coal fell. A newspaper article from the *Herald of Wales* in January 1962 reported pessimistic views about the change related to closure and concerns as to how people would be affected, including through lack of alternative employment or arrangements for those who had been injured in mining accidents or were close to retirement.

The population declined sharply as people sought employment elsewhere. Gradually, elements of the community's everyday fabric fell into disuse and closure. Nonetheless, maps from the 1960s suggest that the actual built fabric within the landscape persisted for much longer than their uses, indicating a degree of material endurance (Figure 7). The Independent Chapel in Onllwyn closed in 1962, though the buildings themselves persisted for another three decades (Davies, 2004). As recalled during the Focus Group with the local community, they also lost their primary school and shops. The pubs survived into the 1980s, but they gradually became unsustainable as the community dwindled, and the local workforce no longer worked to the same rhythm or even in the same locality. These dynamics between endurance and rapid change and the movements and disruptions within the mining communities due to colliery closures are emblematic of the situation across South Wales in the 1960s (Curtis, 2013, pp. 48–51), and they reflect far wider changes related to Britain's post-industrial economy.

As disused buildings were sequentially torn down, raw gaps - the space left by the demolished chapel in a graveyard, the space within the walls of a former school, the marks of a rail line beside an isolated railway station, patches of thorny land between monofunctional lines of houses, a silent locker room set against moorland beyond - created the sense of a semi-dismantled place. These gaps contrast starkly with elements that persisted amid change – homes deemed fit for the remaining population, the forms of slag heaps still swelling beneath scrub, the strong stone walls of Banwen's nineteenth-century ironworks stubbornly standing in a field of horses – albeit in isolation, divorced from the economic, political and social contexts that produced and networked them. Today, the fragmentation has advanced so far that, without reference maps, it would be difficult to explain what is left.

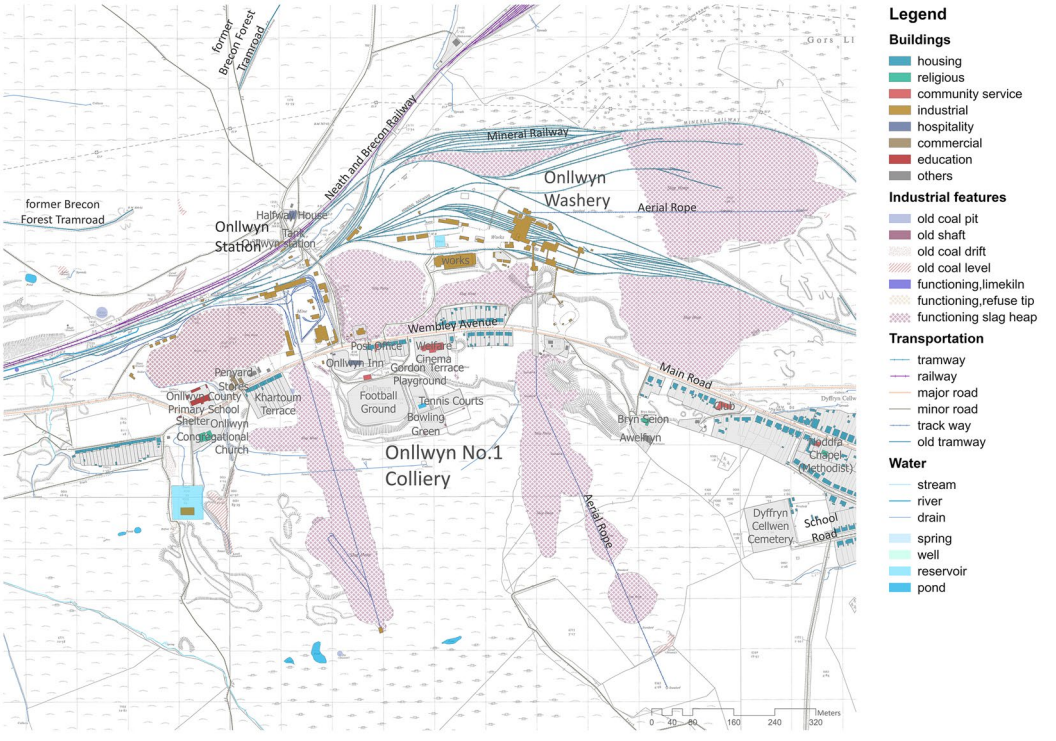

Figure 7. Onllwyn on the 1962 OS map (Tam, 2023b), published with permission.

In the mind, however, the landscape of the past persists at the time of writing. In our interviews, older people aged between 75 and 95, whose memories extended back in some cases to the 1950s, were able to recall a landscape of entangled elements – drawing together mines, chapels, social infrastructures, mountains and so forth. Often, we found that despite the hardships associated with mining life, nostalgia surrounded their descriptions and stories, rooted in a sense of loss. As one interviewee put it:

> We had everything. We had a cinema in Onllwyn, cinema in this village and cinema in Crynant. We had rugby teams, we had the band, we had concerts going, carnival parties… We had a swimming pool here and, to go down there in the summer, well, you could say there were five-six hundred people down there, and kids running all over the shop.

The choice of words here is telling. The past is located – it is 'here' and 'there', in sites that have acquired a different character, whether through rewilding or reuse. Our interviewee recalled this located past, this 'mindscape' (Smith, 1993), as intrinsically 'happier' – as a happier time and a happier place than the post-industrial socio-spatial landscape of today, which no longer includes cinemas or swimming pools.

Fragmentation, at least among those we spoke to, surfaced not just as an unfolding characteristic of the post-industrial landscape but as an affective experience with implications for future placemaking to support wellbeing.

Filling

As described in Section 3.0, the making of the industrial landscape involved the continual movement of materials above and below ground. The 'underland' (Macfarlane, 2019) had been accessed via 'drift', 'slants', 'shafts' and 'levels', and then excavated following seams of coal at

various levels. Historical subterranean maps from the early nineteenth century reveal extensive networks of tunnels extending far back into the mountains separating the Dulais and Neath Valleys (Figure 8). In turn, the above-ground OS maps charting the same period reveal a continually shifting topography resulting from the deposition of slag. They also illustrate how, as workings became redundant, they were often at least partly back-filled with the debris of newer operations (Statham et al., 1987).

In the context of underground mining decline in the 1960s and the concurrent development of open-cast mining, such back-filling processes proliferated, reflecting intertwined processes of remaking and ongoing exploitation of the landscape from this time.

Following the Onllwyn No. 1 and No. 3 closures, the surface of the land and the labyrinthine tunnels from underground mining activities became new dumping grounds for the dusty waste of open-cast mining and slurry from the coal washery at the edge of Onllwyn village (Figures 9 and 10). During an interview with the coal washery's former manager, we learnt that sometime in the early twenty-first century, the tunnels of Onllwyn No. 1 were filled up with this accumulated waste, which had set 'like concrete'.

Appearing as dramatic impositions in the OS maps from the 1970s, the open-cast mines have themselves been progressively back-filled over time, if not always to the original land contours. It reflects the increased speed at which mining technologies have been able to extract coal, the relentlessness of the extraction process amid social hardships, and also some mechanistic and mercenary approaches to landscape restoration on the part of the companies responsible. Huge voids just north of Onllwyn village (Figures 10 and 11), for example, which appeared in the 1970s, were being back-filled during the Miners' Strike in the mid-1980s. The large Nant Helen open-cast mine in Mynydd Y Drym (Drym Mountain)

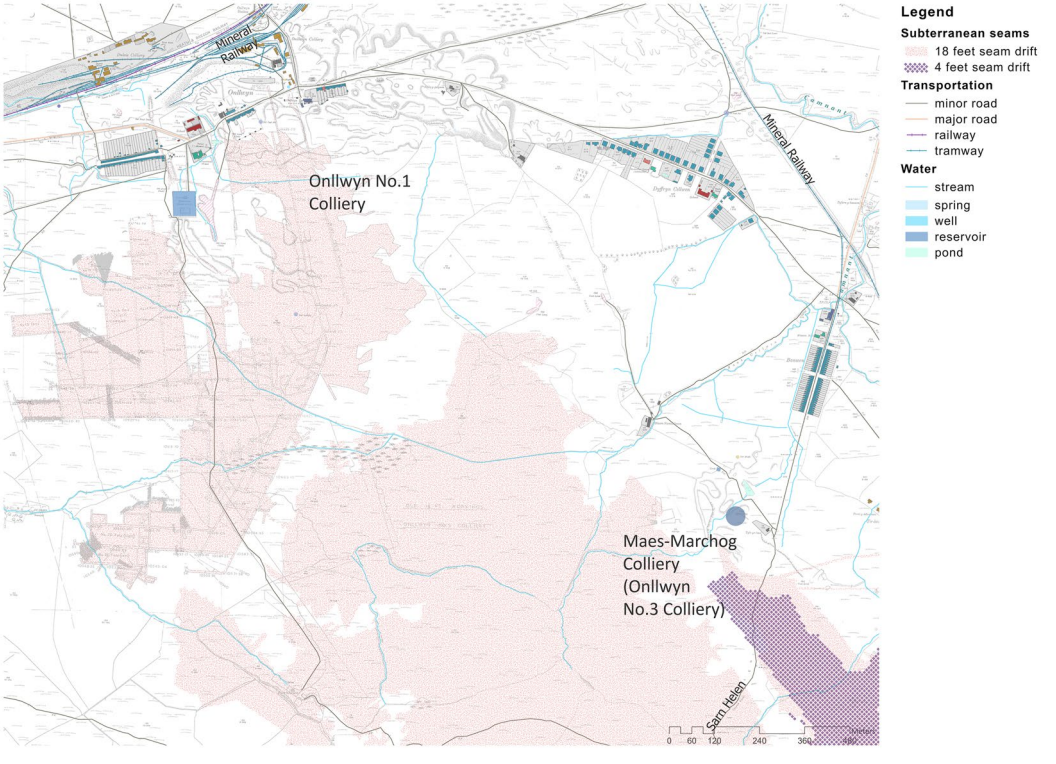

Figure 8. Subterranean maps overlaid on the OS maps of Onllwyn No.1 and No.3 Collieries in the 1910s-20s (subterranean galleries in pink) (Tam, 2023e), published with permission.

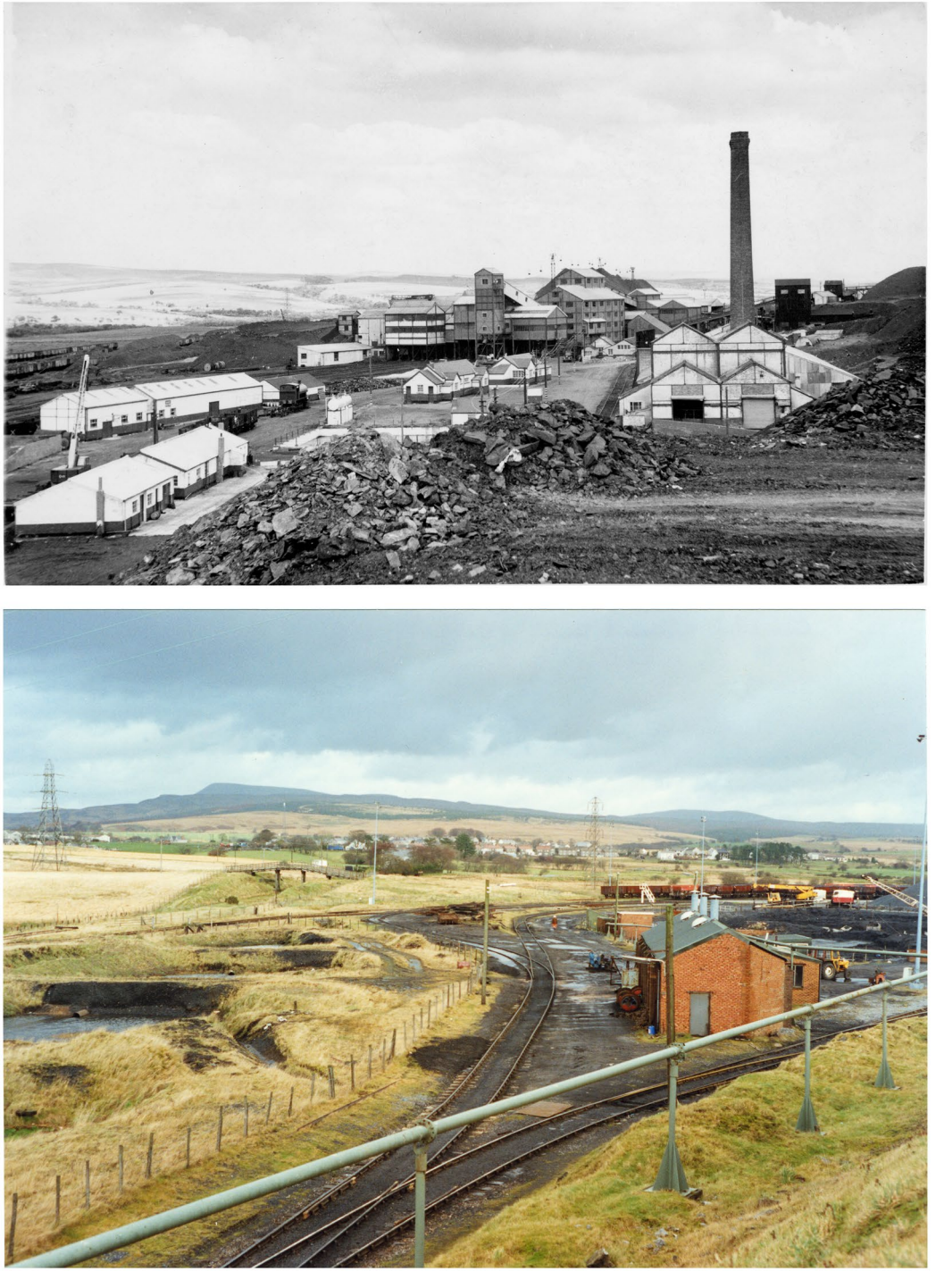

Figure 9. From top to bottom: [Top] Onllwyn Washery and Brickworks c. 1960 (Anon. c.1960a); [Centre] View from entrance to Onllwyn Washery, 26th November 1992 (Anon. 1992); [Bottom] View from entrance to Onllwyn Washery (post demolition), June 2023 (Prizeman, 2023), published with permission.

Figure 9. Continued.

north of Onllwyn was closed as recently as 2021, and back-fill work is underway at the time of writing.

The landscape surface has also received filling-over treatments as historic slag heaps have been reshaped, covered with topsoil and replanted in government-endorsed efforts to both stabilise and green them. These efforts had smoothed over the blackness and dustiness that characterise literary and autobiographical descriptions of Onllwyn, such as in George Brinley Evans's 'When I Came Home' (Evans, 2012) and BL Coombes' 'These Poor Hands' (Coombes, 2002). However, it is essential to recognise that today's 'green' does not represent a simple circling back to the pre-industrial South Wales of fields and open hillsides alluded to in works such as 'How Green Was My Valley' (Llewellyn, 1939). It is the product of complex interactions between mining companies, European, UK and Welsh governments, landowners, grassroots initiatives, spontaneous cultivation and local communities. It is a fundamentally post-industrial and even a post-colonial green. As such, it is a hybrid patchwork of grassland for sheep, grazed upland heathlands, monocultural expanses of conifer woodland, patches of deciduous woodland and hedgerows, remediated wetlands and slag-scapes providing habitats for various species (Gooberman, 2015; Natural Resources Wales, 2015). It is also an anthropogenic green encompassing trees stunted by impenetrable slag, polluted streams, invasive species, and forest dieback.

Different ideas of remediation have shaped the back-filling and filling over of the mining landscape. These range from concerns in the 1960s with putting land back to productive use to notions of health, biodiverse habitat and rewilding today. In turn, human encounters with the newly 'wild' are producing new stories between people and 'nature'. Where once, as one interviewee put it, there was not 'a single blade of grass', there are now trees, reedbeds, waterfowl, diverse insects, birds of prey circling overhead, producing new opportunities for recreation, education, and storytelling. At the Banwen Community Fishery (*Y Pwll*), tucked away near the

Figure 10. Aerial photo of Onllwyn's open-cast workings captured in 1977, adapted from (Cartographical Services (Southampton) Ltd. -. M. y. D. 2-7707-f2041-2042, 1977), published with permission.

DOVE Workshop, created by Wild Fishing Wales with the European Regional Development Fund (Figure 12), we heard of fierce otters 'as large as alligators' caught in the headlights of a car at dusk and of enormous pearl-producing freshwater oysters encountered by anglers.

Overall, filling describes a complex process combining hasty and only partially adequate concealment of extraction traces, the re-ruralisation of the land surface and the formation of new connections between people and place.

Forgetting

At first encounter, forgetting may seem very different from fragmenting and filling - a process that occurs at an intangible level rather than physically. Notwithstanding, it emerged as a concept to understand the consequences of physical and social change to the landscape during fragmentation and filling. Objects and places have a powerful way of anchoring memory, sparking recollection and embodying personal histories. Memories can persist in the mind and present extraordinary resilience despite the disappearance of tangible objects and places. But

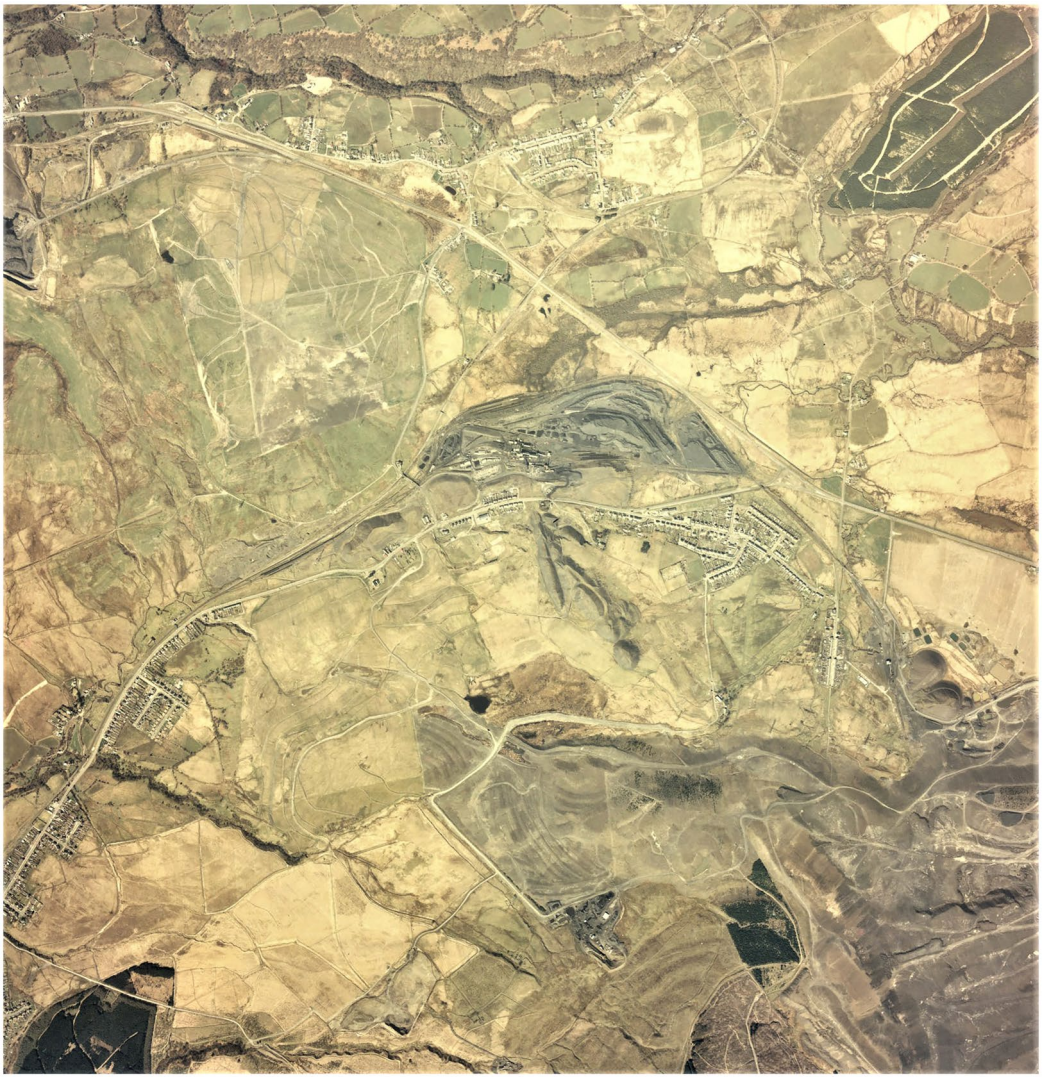

Figure 11. Aerial photo of Onllwyn after the relandscaping as captured in 1985, with slag heaps near the washery still visible (centre of the photo). Adapted from (J.A. Story and Partners, 1985), published with permission.

with traces and evidence disappearing and a lack of effort to promote remembrance, forgetting on the part of individuals and local communities is inevitable, increasing over time.

Post-industrial places, like Onllwyn, have often been stigmatised as 'left behind', 'stagnant', 'spoiled', or failing to undergo a successful 'transition'(Hurley, 2016; Luger & Schwarze, 2024). These are commonly recognised ways of describing peripheralisation (Willett & Lang, 2018). As Luger and Schwarze (2024, p. 196) argue, these terms serve to collapse 'vast arrays of diverse landscapes, economies, politics, and cultures […] into post-industrial imaginaries' of peripherality.

In Onllwyn and Banwen, awareness of such characterisations led to evocative descriptions of the Dulais Valley as 'the forgotten valley' by our interviewees - a landscape felt to have been made clean and green again, yet overlooked by capital and the state in comparison with nearby valleys and other post-industrial places in the UK. This overlooking was seen as a detriment to the intergenerational communities that industrial settlements traditionally sustained, leading to the loss of a sense of belonging among younger people. These experiences also evoke anxiety as older community members fear the loss of knowledge related to the industrial past and its significance to the

Figure 12. *Y Pwll* in Banwen (Davis, 2024).

community. The sense of forgetting, hence, seemed to go hand-in-hand with a sense of longing for place-based identity, recalling the Welsh word *hiraeth*[1]. This calls for sensitivity in regeneration efforts immanently planned for the area (Global Centre of Rail Excellence, 2025).

Forgetting is also intricately linked with processes of heritagisation, either formally or informally. Our interviewees conveyed the desire that stories of Onllwyn's industrial past would be preserved and passed on and, more importantly, be known and remembered by future generations. They did not romanticise the hardship and danger of working in the mines – some bore traces of terrible injuries from mining accidents - but were convinced that these histories were part of local identity and should continue to be known. Increasing attention to industrial history in heritage studies (Berger, 2019; Taksa, 2008) suggests the potential for regeneration practices to turn from erasure and demolition towards preservation of retained fragments of the past within the landscape.

Indeed, the Dulais Valley today is not without signs and memorials that, amid fields and wetlands, allude to the tunnelled 'underlands' and coal strata beneath the ground. From the descendants of the pit ponies that graze the hillsides to the stunted woodlands, the coal-scape continues to exert a presence (Figure 13). In addition, ephemeral records of the past exist in abundance. Much as the landscape itself, however, we found these to be scattered across various archives, including the local Cwm Dulais Historical Society. At the time of our research, the society's archive of over 3000 items was stored in the archivist's own home. Local capacity was limited regarding the dissemination and exhibition of these items. Most of these archival records desperately needed conservation as well as digitalisation and cataloguing to form a virtual, publicly accessible historical landscape (Figure 14).

As the recent critical turn of heritage studies has pointed out, narratives around heritage, and particularly industrial heritage, have the power to exclude as well as to commemorate

Figure 13. Former Onllwyn No. 3 slag heap, veiled by a thin layer of green (Tam, 2024).

Figure 14. A descendant of the pit ponies next to former site of Onllwyn No.1 (Davis, 2022).

and remember (Reading, 2015; Smith, 2025; Smith et al., 2011; Taksa, 2018). It should be noted that, due to various constraints, interviewees for our research were predominantly Welsh white men, even though Onllwyn was known for its very active women's groups both during the 1980s Miners' Strike and beyond. With traces of the industrial past and

Figure 15. The Cwm Dulais Historical Society archivist has painstakingly collected over 3000 items from local community members over the years (Davis, 2023).

the social fabrics that bound communities together gradually disappearing, their memories are even more likely to be forgotten (Figure 15). Their stories deserve to be told through collecting further oral histories and examining historical materials with a focus on previously neglected groups. This is pressing work as, after more than sixty years since the closure of the Onllwyn Collieries, it will not be long before there is no one left alive to describe the past landscape as it was lived.

Conclusions

This article has examined the emergence of a post-industrial landscape in the former South Wales coalfield – Onllwyn in the Dulais Valley- through a relational and processual lens. As discussed in Section 1.0, relational and processual approaches have become increasingly adopted by landscape scholars such as Wood and Handley (2001), Mitchell (2017), Stenseke (2018), Cockburn et al. (2020), and Qviström (2023). This body of work highlights the complex and dynamic nature of landscapes, which is pertinent to our explorations of a post-industrial landscape. Building on these approaches, our study has traced the unfolding and remaking of connections and relationships that constituted the industrial landscape of Upper Dulais Valley, including between productive infrastructures and geology and between the physical industrial complexes and intangible socio-cultural infrastructure. The call for nuanced understanding of post-industrial places carries national and international significance, both in the context of the Welsh Government and UK Government's efforts to 'level up' for deprived former industrial communities, and in post-industrialisation that was, is, and will be happening elsewhere, such as post-socialist Central and Eastern Europe and China in its transition away from coal (Czepczynski, 2010; Gong & Lewis, 2024).

We have scrutinised the process of the post-industrialising landscape as one in which many relationships become fragmented, transformed by back-filling or filling over, or forgotten due to the changing mode of industrial production, the disappearance of the productive and social infrastructures, and demographic change within communities. Local community members' lived experiences demonstrate that the loss of the collieries was acutely felt due to the rapid disappearance of jobs, schools, chapels, mobility infrastructures and, eventually, housing and communal bonds, compounded by a lack of just transitional opportunities.

At the same time, we see persistence and resilience within the landscape. Physical traces continue to tell stories of the industrial past. The industrial landscape has also persisted in people's memories and continued efforts to transform and rehabilitate the local environment and re-cultivate the sense of community, demonstrated by local rewilding projects such as *Y Pwll*. These efforts were either a reaction to the environmental impact of these former carbon-heavy industries or stemmed from the strong sense of solidarity born out of these industries. The consistent effort to document and commemorate local histories, exemplified by the South Wales Miners' Library and the Cwm Dulais Historical Society, is also a bottom-up reaction to the forgetting process.

We argue that identifying the changing and emerging connections between landscape elements is crucial for informed decision-making during regeneration. The insights into the formation of the post-industrial provide the basis for thinking strategically – from attending to fragmentation, to confronting the legacies of extraction and filling, to preserving place-based memory and addressing local experiences of being forgotten or overlooked. They also highlight the importance of recognising the complexity and ambivalent nature of post-industrialisation, its ongoing dynamic nature, and potential significance as such for efforts to create a just transition and sustainable future for the community.

Note

1. It can be roughly translated as 'longing to know one's history' or nostalgia, but it is indeed difficult to find a precise translation in English.

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Permission for third-party or identifying materials

Confirm permission has been obtained to publish third-party material (e.g. figures, creative work) from the owner of the original material.

Research ethics and consent

The research was conducted with the ethics approval of the Welsh School of Architecture Ethics Committee, Cardiff University. All participants have given oral and written informed consent, permitting the use of anonymous data to be published in academic publications and report of the project. No identifiable details are included.

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Data availability statement

There is no data available.

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