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Emplaced activism: what-if environmental education attuned to young people's entanglements with post-industrial landscapes?

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Abstract

Cultures that recognise the many forces and memories held in landscape can make important contributions to climate emergency. We argue there is another group which has knowledge to call upon; young people growing up in post-industrial places. In this paper, we draw on over 10 years of research with young people to speculate about the potential of outsider knowledge as the basis for emplaced activism as an original and significantly new approach to environmental education. The first part of the paper presents the argument, concepts and methodology for thinking about environments as lived experience. Next we introduce the place where capitalist and industrial forces are knotted with the distinctive histories of post-industrial communities. Place is explored through stories of the geological and historical legacies of south Wale's valleys in sections titled: Earth Matters; Industrial Matters; Affective Matters and Matters of Decline. Next, three lines of flight that took off in creative workshops with young people: Troubled Landscapes, Embodied Landscape and Activist Landscapes are presented. Finally, we set out a new approach to environmental education and research by asking what if environmental activism starts from young people's troubled experiences of living in marginal and forgotten places?

Introduction

We take the stance that environmental education cannot be taught in discrete lessons and instead needs to arise from young people's lived experiences of landscape. There is a growing recognition that some cultures have cosmologies that recognise the many forces and memories held in landscape (e.g. Griffiths, 2018; Pascoe, 2018; Tuhiwai Smith, 2012). While these cultures have something important to tell Western cultures in times of climate emergency, we argue there is another group which has knowledge to call upon; young people growing up in post-industrial places. We ask *what if* we approach environmental activism by starting from young people's troubled experiences of living in marginal and forgotten places, such as post-industrial places? In this paper we speculate about the potential of young people's outsider knowledge as the basis for *emplaced activism* as an original and significant new approach to environmental education.

People living outside the comfortable securities of affluence live life 'without the promise of stability' (Tsing, 2015, p. 2). They are forced to confront the immediate, visceral, visual and tactile atmospherics of post-industrial wastelands close-up. Faces and feet are sucked into affective environments of boarded-up shop fronts, street lighting that flickers, discarded needles, potholes and

derelict buildings. These are the forgotten places where the lingering waste of intense mineral extraction has never properly been attended to or cleared up. The aftermath of industrialisation echoes down the centuries as hauntings of past lifeworlds. Yet, worms, ants, water and gravity continue to transform coal dust, sludge, slag heaps and underground tunnels. For example, earth has crept into hidden canals left over from industrial times and microbes, plants and insects inhabit crevices in brick walls, iron railway lines and disused tram tracks. And in the midst of this organic re-wilding, young people navigate, invent, explore and compost the social and material ground into a billion tonnes of micro-political and poetic topsoil sending spores spinning into the virtual ether through WhatsApps and TikTok. 'Multiple futures pop in and out of possibility' (Tsing, 2015, p. viii).

If poverty is the underbelly of capitalist financial gain then the knowledge of living purposefully at the very edges of civic society is already outsider knowledge. Amidst the ongoing, organic re-wilding endemic within urban decay, young people are caught up in processes of survival. While their lives may look and feel like social neglect, at the same time, fractured contradictions are generating new life each day. In post-industrial places, young people often tap into the immanent knowing(s) lying above and beneath the ground. In their desires to thrive, enormous inventiveness and creativity are entangled with pain, scarcity, precarity and neurodiverse perceptions; symptoms of a capitalist world sliding out of synch with human flourishing. In the capitalist ruins young people's practices, creativity and activism erupt in the densely knotted, ghostly histories of post-industrial landscapes, which are potential sources of worlding otherwise and thinking about environmental education and research in new ways.

The first part of the paper presents the argument, concepts and methodology for thinking about environments as lived experiences. Next we introduce the place where capitalist and industrial forces are knotted with the distinctive histories of the communities of the south Wales valleys. The place is explored through stories of the geological and historical legacies of this specific ex-industrial landscape in sections titled: Earth Matters; Industrial Matters; Affective Matters and Matters of Decline. Next, three lines of flight that took off in creative workshops with young people: Troubled Landscapes, Embodied Landscape and Activist Landscapes are presented. Finally, we set out a new, *what if* approach to environmental education and research.

What If Environmental Education

Environmental education is often taught in schools. Yet, schooling as it has developed in anglophile societies has run aground, overtaken by marketisation where knowledge is treated as a commodity to be consumed. Gert Biesta (2014) coined the term 'learnification' to indicate the way education has become reduced to a pseudoscience. This pseudoscience proffers a notion that it is possible to make all young people take in information more efficiently. Those who have gained control of education systems refer to an ideal neurotypical learner. This is the latest in a long line of pseudoscientific terms that suggest learning is built from an essential biological bedrock, which at other times has been imagined in terms of skull size, bone structure, genes, IQ and DNA (Ivinson, 2014a). The neurotypical fantasy privileges a white, western, anglophile, middle-class 'norm'. The curriculum is heavy with subject content, and students are tested to ascertain if they have digested the content. Anyone failing to provide enough 'right answers' in assessments falls outside this narrow definition of neurotypicality and becomes judged as educationally subnormal. Teaching about the environment in this system becomes a bureaucratic endeavour; a detached, dislocated and abstract approach, which shores up a myth of liberal progressivism in which man [sic] stands outside and above the environment.

The term Anthropocene refers to the impact of human activity on climate, land and the biosphere with unprecedented scales setting a course towards species extinction. Three spikes are often specified; the 1610 colonial expansion, 1800s Victorian Industrial Revolution and the

Great Acceleration from the 1950s onwards. The Industrial Revolution and the aftermath of this over two centuries is cited as a turning point in levels of pollution and the transformation of land due to intensive mineral extraction. Much environmental education thinking is backgrounded against a notion that humans have extracted too much from the environment. Accordingly, sustainability requires people to stop industrial mining, deforestation, over fishing and intensive agriculture. However, the notion of human extraction re-inscribes a subject—object binary such that agentive, knowing subjects act on inert, (dumb) matter, reinforcing the notion that humans are situated outside nature in a god-like way (Haraway, 2016). *What if* instead of thinking in terms of how human labour is destroying environments through extraction, we think of different groups of humans entangled with environments in ongoing dynamic processes of worlding?

Material feminist and Black feminist scholarship place an emphasis on 'ongoing multispecies practices of becoming-with other beings' (e.g. Haraway, 2016, p. 55). Instead of the term Anthropocene, Donna Haraway prefers 'Chthulucene' from the Greek *khthon* meaning heritance or remembering and *kainos* meaning time of being (ibid., p. 2). Feminist scholars have been concerned with the agency of matter and reject Cartesian binaries such as alive-dead, and specifically the notion of matter as inert and HuMAN minds as agentive (Bennett, 2010). They refuse linear cause–effect connections and instead queer concepts of time and space (Barad, 2007) to emphasise that what happens in one space impacts another place and that pasts, presents and futures are entwined. Rather than thinking of separate spheres of inhabitation, Haraway uses tentacular metaphors to stress a sense of porous tissues, open edges and contact zones (Haraway, 2016, p. 32). She urges us to think of humans interconnectedly living with all inhabitants of the earth including 'cnidarians, spiders, raccoons, squid, and jellyfish' in webs of existence. Heather Davis points to the limits of human exceptionalism, suggesting we are always indebted to others, such that 'our being is tied to the rocks and other-than-humans that compose us' (cited in Davis, 2018, p. 63).

Furthermore, Kathryn Yusoff (2018) criticises the term Anthropocene as a European, liberal concern based on a White Geology which fails to recognise race. She reminds us that 'Imperialism and ongoing (settler) colonialisms have been ending words for as long as they have been in existence (*ibid.*, p. xiii). When the 'Anthropocene' is seen as *the* threat to the planet, she argues, it is actually a threat to liberal white communities and can only be recognised as a spike of planetary emergency if the billions of extinctions of people, cultures and ways of living that supported and continue to support capitalism are forgotten. Imperial capitalism worked by removing black, brown and indigenous peoples from their lands, taking possession of their territories and remorselessly extracting minerals, while eradicating ecosystems and ways of life. Across time, enterprising merchants benefitted from buying, owning and subjugating people, reducing them to raw energy to power the production of sugar, cotton, tobacco and gold. In the 1800s the wealth generated by the transatlantic slave trade fed back into south Wales as investments which kick started industrial mining (Ward, 1994). The 'slave-sugar-coal nexus' enriched Britain (Yusoff, 2018, p. 43). Yusoff argues that 'Coloniality cuts across earth and flesh' (*ibid.*, p. 12) pointing out that the world has already come to an end for so many minoritarian communities.

Shifting the focus to the agency of nature, Anna Tsing describes the way fungal bodies extend themselves below the forest floor in 'nets and skeins, binding mineral soils long before producing mushrooms' (Tsing, 2015, p. viii). She portrays the possibility of co-existence within environmental disturbances as 'arts of living on a damaged planet' (*ibid* 2015, p. 34). Maria Puig de la Bellacasa focuses on soil and how terrains intensify intimate interdependency.

> These new involvements with soil's aliveness open up a sense of earthy connectedness that animates and re-affects material worlds and a sense of more-than-human community in those involved (Puig de la Bellacasa, 2019, p. 391).

In ex-mining communities, young people are entangled with terrains where the industrial waste of intensive coal mining has not been cleared up. These are places where the forces of rock, water, air and gravity continue to transform the landscape. Our approach recognises that young people living in these post-industrial places are undertaking ongoing worlding(s) in the capitalist ruins. Accordingly, environmental education shifts from questions of how humans will survive, to matters of relational multispecies generation and decay.

Concepts to World-With

The term 'worlding' introduces concepts from process, post-human and new feminist material-ism(s) philosophies that de-centre the human and recognise nature as alive. New material concepts provided us with ways to recognise how environments pervade, interfere with and conjoin community life and human beingness (Barad, 2007; Manning, 2020; Massumi, 2011). Process philosophies (Bergson, Whitehead) help us to see landscape not as a backdrop to human action but as agentive and made up of multiple movements and forces. The rhythmic effects of light, water, gravity and energy concern all life forms and the boundary between human and nature is blurred. Accordingly, humans lose the heroic status of superior and the nature–human divide is recalibrated as an ongoing, multiply relational, unstable dynamic. We have to think with assemblages rather than strict demarcations and separations. Subjects cannot be viewed as unitary, and knowing becomes contingent, provisional, speculative and creative. Concepts such as 'more-than-human', 'immanence', 'affect' and 'transpersonal' can be used to expand concepts currently informing environmental education and research.

We can only make connections between the present and the history of south Wales speculatively, for we can merely hint of the hidden forces, geological rumblings and social and political hauntings that make up the place where the young people live and breathe. Providing hints of what might have gone on in the past, how the Industrial Revolution changed the terrain and what is left in the aftermath of mine closures points to a kind of ontological immanence. Held in immanence are virtual strands of how past communities organised life as well as residues of the effects of the changed landscape, such as slag heaps which feature later in this paper. People's experiences linger as virtual forces in the movement, sights, sounds, rhythms and affects that continue to traverse valleys life. We use the concept of immanence to refer to these ghostly residues that sometimes, partially instantiate themselves in the actual events that make up 'ecologies of life-living' (Deleuze, 1994; Manning, 2014; Massumi, 2011; Stengers, 2010). We use the term 'virtual' to hint of the reservoir of forces and practices belonging to the histories of mining communities in south Wales that infuse young people's events in the present (Ivinson & Renold, 2013a; Ivinson, 2014b). What can be actualised in the present might vibrate with virtual forces affectively carrying minoritarian, hidden knowings and we have found that these are prone to erupt when imagination is allowed to roam. In creative lines of flight lie the seeds of other worldings and different ways of living in this planet.

Over many years, our longitudinal work in ex-mining communities in the south Wales valleys was primarily concerned with the troubles young people revealed about living in a post-industrial place rather than with environmental education. Yet, we feel that the insights young people gave us of their landscape are informative for environmental education. To attune to these troubles, we have been forced to invent methods that could deal with immanence and affective legacies that reverberate across time. Conventional concepts such as linear time could not help us with intergenerational trauma. They did not help us to recognise behaviours that register in the gut as half suppressed screams, imbued with forces, impulses and hidden knowings that could not be communicated in language. We could see and feel young people spilling out all over the place defying any sense of a bounded Cartesian subject and the landscape was by no means inert or stable. In seeking to make visible and acknowledge all this pressure in young people and under ground,

we needed concepts such as immanence and a dynamic sense of events unfolding in micro-movements and in microseconds and more than anything else we needed new ways to think about subjectivity. Felix Guattari's (2006) concept of transversal subjectivity came to our aid (Ivinson & Renold, 2013b) as did the burgeoning new ways of thinking about matter as dynamic, fluid and forceful (Barad, 2007; Bennett, 2010). By paying attention to immanent forces relating to specific landscapes we can think about environmental education and research differently.

Methodologies to Make-With

This paper is one of a series in which we describe our intra-activist praxis (Renold, 2018) of slow co-production with young people in Welsh valleys. We are not trying to understand the past, so much as recognise what is immanent from the past that installs itself in the present. We have found that if we craft practices with young people in safe, inclusive spaces, they come to actualise what they feel beneath their feet or in their bellies. We often do this by providing an array of art materials and arts-informed techniques. We often supply materials such as paper, fabric, paint, glue, plasticine, clay, ribbons, feathers, zips and whatever comes to hand. We have been fortunate enough to work with many artists whose crafts have helped us attune to vibrations from the past that inform young people's lives. Suppressed forces often find expression in the most unlikely and creative ways.

We take inspiration from Manning's prompt that in mediaeval times art was understood as 'the way' (2016, p. 47). This sense of art as a passage helped us to think of creative processes as transversal and always on its way. We glimpse new potential as young people make, move, speak and invent. Our approach is not about deploying pre-conceived, arts-based methods for 'data' that is waiting to be captured (Manning, 2015), so much as trusting that assemblage of matter, space, location, time, material and care together afford opportunities in which suppressed, embodied, ineffable, hauntings and residues of the past might partially instantiate themselves in the things young people create. From complex, contradictory, affective entanglements with the landscapes on their doorsteps young people gift us artefacts, poems, collages, films, cries and songs of precarity (Renold, 2018, 2019a, 2019b; Renold & Ivinson, 2019, 2022). These fragile new forms of expression enable us together and in common (Moten, 2016) to rethink dominant tropes in traditional environmental education such as decay, extraction, extinction and capitalism providing the basis for a response-able (Barad, 2007) youth informed, forward looking, environmental education research agenda. Next we speculate about the affective landscapes the young people are living with by starting with geology.

Earth matters

The valleys of south Wales were once the biggest coal bed in the world. As Ted Nield points out, 'Earth Materials—can only be won where they occur' giving rise to communities where none would otherwise have existed (Nield, 2014, p. 90). The coal seams were laid down during the Carboniferous period between 298 and 323 million years ago as the earth's surface buckled under tectonic pressure. The buckling created an elevated plateau that is trenched on all sides by deep valleys. Iron ore and coal seams were created when folds of the earth compressed vegetable matter from ancient water-logged, peat bogs. The coal seams are found in numerous minor syncline folds, which are sliced with layers of limestone (Figure 1). The shape of the folds ensures that coal seams emerge close to the surface (Trueman, 1921).

Coal is found in seven valleys that lie on a north to south axis in parallel formation to the south of what is called the Wales-London-Brabant High (https://en.wikipedia.org/wiki/Geology_of_South_Wales, accessed 14/04/2019). We worked in the Rhondda Cynon Taff valleys featured in Figure 2.
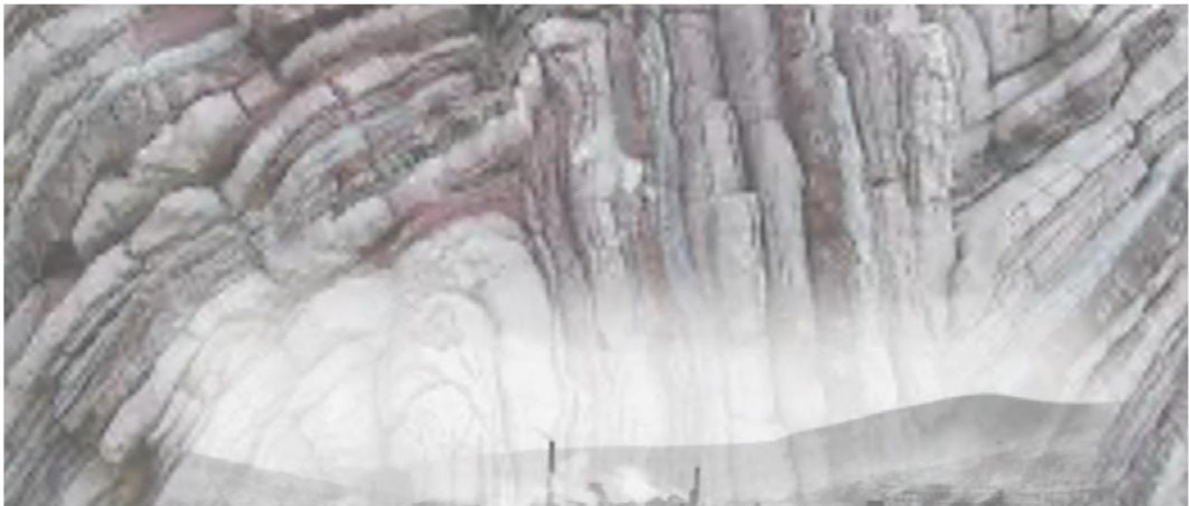
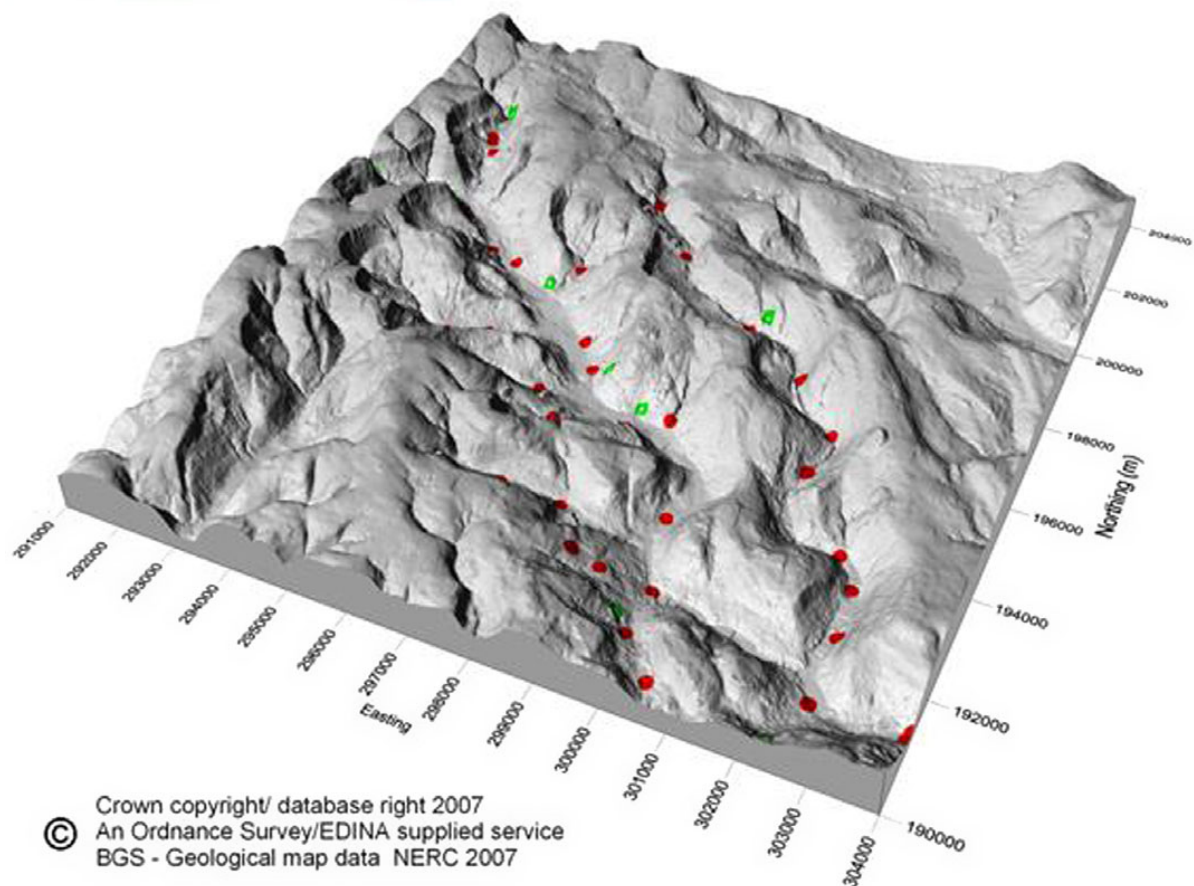**Figure 1.** Syncline folds artist's impression.

Figure 2. Map of Rhondda valleys in south Wales with mine shafts.

The landscape had been densely forested. It is made up of interlaced trails of valleys, steep mountainsides and gushing rivers. This geology provided ideal conditions for industrial iron ore and coal mining.

Industrial matters

The south Wales valleys formed the engine house of the Industrial Revolution due to the availability of iron ore and coal. Before industrialisation, the upper Taff valley had been farmland dotted with small villages. The availability of limestone for lining furnaces, mountain streams to provide transport, and forests to supply timber for the charcoal that heated the early blast furnaces contributed to the growth of the iron industry in the eighteenth century (Trueman, 1921). In Merthyr Tydfil, seven enormous steel works stood like giant cathedrals dwarfing farms, ensuring inward migration and the rapid need for houses. In 1804 the first locomotive invented by an iron master at the Penydaren Iron works ran between Merthyr Tydfil and Abercynnon (www.thevalleys.co.uk/ 2011). By the mid 1850s a network of railways criss-crossed the valleys. People used to say that the night was lit up for miles around by the steel plants which never slept. The work was dangerous, hot and noisy.

The mass production of coal took off as the steel industry declined. By 1910, the British Empire covered over 17 million miles of territory across the globe won through many battles fought at sea. Britain's naval prowess relied on the high quality, smokeless fuel that came from the south Wales valleys. Given the thirst for coal, wealthy landlords were able to lease stretches of their land above the coal bed. Entrepreneurs, some of whom had made money in the slave trade, employed engineers to sink the mineshafts. Thousands of miners were employed on low wages to dig underground tunnels following the contours of the winding seams. Until 1900 coal was plentiful. It was said that all a mine owner had to do was send increasingly large numbers of men underground and whatever they brought up, could be sold. The quality of the coal kept the valleys at the epicentre of industrial activity up to the 1920s. The complex railroad system transformed the rural landscape into a harsh industrial scene dominated by stations, mineshafts and buildings where the coal was sorted and washed. Slag heaps of unwanted waste from the mines grew behind and above streets, houses and schools. As one resident said, everything was connected to coal like a machine that engulfed everything (Hargen, 2016). In Imperial Britain the great wealth was not shared equally among the people.

Affective matters

Just as the landscape was transformed to service capitalism, so communities grew and people developed ways and means to undertake the dangerous work of mining. As miners knew, matter is not inert. Digging, drilling and using explosives made the land unstable. Underground rivers found new routes. Working within the bowls of this volatile terrain was dangerous and hot. In the late 19th century, a man was injured every 2 minutes and killed every 6 hours in the south Wales pits (https://britishheritage.com/the-life-and-death-of-king-coal-in-south-wales/npn. accessed 23/04/2022). To live and survive in this dangerous underground environment miners develop a sixth sense or what Sauer (1998) refers to as 'pit sense'. As Massumi's work suggests, imminent danger was a force already forming in the acts of mining as a felt experience—in movement—with a temporal contour, which gave an intense 'sense of aliveness' (Massumi, 2011, p. 43). This hyper awareness of the sounds, textures and smells of the underground landscape kindled a specific kind 'felt-knowing' (Massumi, 2011, p. 65) by those who were steeped in the practices of underground mining. Vestiges of this attitude can still be detected in specific forms of sociality present in valley communities today.

Pit sense came in various forms. Some men knew which trees growing on the mountainsides provided the right kind of wood for pit props. Others knew that a specific kind of popping sound indicated that a wooden beam was about to collapse under the weight of tonnes of rock. The underground passageways were coated with white chalk to slow the progress of potential fires that could rip through the tunnels at high speed if methane ignited. Horses were stabled below ground and hauled coal trolleys along the passages to the surface. Miners were attuned to the

horse's corporeal movements as the animals could detect the sound of shifting rock before the human ear could. Fear of the imperceptible movement of rock infused each move the miner made as a kind of sixth sense.

Communities developed ways to cope. For example, men on the day shift would work extra long hours to build up coal reserves so that the night shift worked fewer hours (personal correspondence, with an ex miner). Men were required and expected to develop strong muscles, specific kinds of dexterities and body techniques. Ex-miners told us that they spoke about everything underground; family, money, love and relationships. Male labour and solidarity became part of a nexus of practices endowing miners with value in a field where working men were subjugated to the control of wealthy mine owners. Reasserting the status of their masculine labouring bodies was part of resisting subjugation.

These 'affective practices' (Walkerdine, 2010) also reinforced strong, reciprocal, gender roles. A hierarchical gender value is still maintained by practices that endowed male labour with high status and reciprocally devalue women's domestic labour and caring roles above ground. Women developed routines to make mundane work bearable and in so doing formed collective habits of sociality, such as, sweeping front steps, washing clothes and baking on specific days of the week (Walkerdine & Jimenez, 2012). We have referred to these patterns, rhythms and routines of community life as a community beat (Ivinson & Renold, 2021).

These forms of sociality relied on specific rhythms and routines below and above ground, which were the molecular forces holding the community body together. These affective practices forged through the closeness of danger, precarious working careers and the necessity of dealing with loss shaped the range of possible body movement repertoires available to men and women and forged habits that are passed down intergenerationally (Ivinson, 2014b; Renold & Ivinson, 2014). Strong reciprocal gender roles formed the fabric of community life and its survival. These forms of sociality extend highly distinct gender roles to children and young people growing up in mining communities, even today.

Matters of decline

By the 1970s oil replaced coal and British mines were no longer competitive. Coal mining was brought to an abrupt end in the 1980s when the Tory Prime Minister, Margaret Thatcher, set about forcefully closing the remaining mines. Violent conflicts between the trade unions and Thatcher ensued as striking miners and their families fought for their jobs and their way of life. With the closure of the coalmines, communities lost their raison d'être and are now blighted with mass unemployment and governmental neglect.

The landscape bears the scars of decades of mineral extraction leaving hundreds of miles of underground tunnels, derelict buildings and slag heaps. The methane escaping from landfills and the tragic collapse of slag heaps can be seen as examples of nature 'acting back' in the wake of industrial exploitation. Shifts in the use of land from mineral extraction to waste disposal or tourism leave some local people feeling increasingly dispossessed. Next we turn to some of these complex and contradictory relations with the post-industrial landscape.

Line of flight 1: troubled landscapes

In one of our studies, while exploring young people's perceptions of place we found that in general boys appeared to experience place differently to most girls. In public spaces specifically, girls expressed a desire to be together *en mass* with their friends. They spoke of the protection afforded by togetherness as well as the difficulty of living in a place where everyone knew everyone else. Down at the local skatepark, girls typically stood or sat on the edges watching while boys performed tricks on skateboards and BMX bikes. While boys talked about building dens so they could stay out in the forest all night, girls talked about building them to create enclosed places where

they could talk or practice street dances in private. Boys perceived forest trails as terrains for practising biking skills while girls sometimes climbed mountains or rode horses to get away from people (Renold & Ivinson, 2014). Moreover, while girls experienced the liberation associated with the wild this always seemed to be tinged with a haunting sense of danger, creating a need to be alert and to know 'where you could run to'. When talking about places, boys tended to stress their sense of independence and the opportunities the landscape afforded to master skills such as trail bike riding (Ivinson, 2014b). Girls' talk was tinged with self-conscious awareness of their bodies as potential sexual objects open to a ubiquitous, predatory male gaze (Ivinson & Renold, 2016). Yet, as we discuss below, while alone in the mountains some girls imagined themselves in different places beyond the limits of parochial valley life. In sum, the desires and fears boys and girls associated with places made us recognise the significance of urban and rural landscapes as gendered places imbued with particular meanings. Indeed we came to understand how place made our participants 'valleys' girls' (Ivinson & Renold, 2013a).

While undertaking ethnographic work in classrooms we observed that some young people and especially boys found it difficult to settle themselves in lessons. In contrast, we were struck by girls' docile bodies within school (Ivinson & Renold, 2020, 2021). For example, Gwaun (pseudonym, age 14) told us that when he found the pressure and social interactions at school too challenging he absented himself from school and went to work on his aunt's building project. He had a complicated and difficult home background with much separation and loss due to divorce. In Gwaun's inability to keep his body 'in place' in school we glimpse the somatised pain that is bigger than him.

In this post-industrial landscape, young people live close to the rawness of life and death. We heard many stories of death; still born babies, babies dying in young arms and suicides. While researching in a secondary school we met Aled (pseudonym, age 14), who had been removed from mainstream classes due to his behaviour. His teacher said he antagonised the other boys by acting in ways that were hostile, distant and attention-seeking. In one workshop, Gabrielle unrolled a large piece of paper with a Google map depicting streets, buildings and railways lines covering a 10-mile radius around the school. As she unfolded the map Aled looked startled and exclaimed, 'That's the railway line.' His expletive was so full of anguish that the other boys fell silent and Gabrielle gently asks, 'What is it about the railway line?' Aled replied quite briefly, 'My granddad was killed by a train.' A profound silence ripped across the otherwise noisy classroom. At this moment, we could speculate that immanent vestiges of the solidarity characteristic of pit sense emerged among the boys as a virtual communal knowing of loss.

After the lesson, Aled revealed that his granddad had jumped in front of a train after his nan (grandmother) had died because he could not bear to live without her. His granddad had been a miner. During our informal chat days later, he disclosed that three close family members had been killed or had committed suicide in the last 2 years. Suicides rates by men and boys in south Wales ex-mining valleys peak periodically (Jones et al., 2013). From our perspective, Aled appeared to be in a state of traumatised grief. A transversal chain of events culminating in his granddad's suicide seemed to have inhabited Aled's body. Mass unemployment brings young people close to the trauma and mental ill health suffered by their grandparents and parents. Aled's body literally vibrated with the traumatic loss that had plunged the whole community into poverty and despair.

Line of flight 2: embodied landscapes

Girls growing up in ex-mining valley communities inherit gendered expectations that continue to police their corporeal movements today. Body movement repertoires are infused with reciprocal gender roles forged in the past that continue to function in the present. Like Iris Marion Young (2005), we noticed that some girls hesitate on the edge of movement. We became aware of specific kinds of gestures such as repetitive stroking of hair and as they folded their arms protectively around their bellies (Ivinson & Renold, 2020, 2021). We imagine the values attributed to the male

labouring body as a virtual immanence, which infiltrates girls' corporeal movements as they are forming. These virtual forces are not perceived, they are acted without conscious awareness, as negative prehensions (Manning, 2013, p. 19). Manning refers to ontological immanence, as the virtual force of movement as it traverses and insinuates itself in movement as they take form. Accordingly, 'The past lives in the present, not as cause but as potential' (Manning, 2020, p. 83).

In the last week of school, in the summer of 2013 we had the opportunity to collaborate with choreographer Jên Angharad. We developed a 4-day intensive workshop and invited girls to volunteer to take part. 18 girls came into our safe space to let their bodies do the talking. Jên's intervention reconfigured the co-ordinates of space-time by moving her body and introducing rhythm and tempo via music. She paid close attention to the gestures, and the unconscious fidgets, squiggles and jiggles the girls brought into the space. By exaggerating them using a range of physical exercises she worked them into new body movement practices expanding the girls' movement repertoires over several days. As the girls opened up physically so they opened up emotionally—becoming safe they started to talk about how they really felt—growing up in a post-industrial rural valleys town. Some girls talked of oppression and fear and how they craved to live and move outside gendered strictures and expectations (Ivinson & Renold, 2021). We have been touched by the never-ending labour of care that girls and women show towards others (Bright & Ivinson, 2019). We felt their bodies open up to memories unlocking affects that erupted into stories of feeling watched, constrained, oppressed and angry followed by bursts of corporeal joy, abandon and pure desire. Through these dynamic body-room-place assemblages we glimpsed the possibility for an infinite variety of potential velocities as girls danced to a different beat transforming the near landscape from surveillance to freedom.

Line of flight 3: activist landscapes

The next line of flight comes from the second author's recent work re-thinking what relationships and sexuality education (RSE) can be in schools when explored through the expressive arts (see Renold & Timperley, 2022). This project evolved in ways which revealed how young people are tapping into the affective forces of landscape in many ways. We focus here on a series of creative workshops in which young people created artefacts and then reanimated them in co-produced short films and soundscapes with artists Heloise Godfrey-Talbot and Rowan Talbot who have both worked closely with us over many years. During the workshops, one young person, Alys (pseudonym, aged 14), who had lived all her life in the valleys, created a clay sculpture (Figure 3) across a number of weeks. As she worked she expressed feelings of being silenced in her community, school and on social media.

The sculpture emerged as she worked with numerous messages that she and others stuffed into a jar in an activity called, 'What jars us' (see Renold & Ringrose, 2019). They coloured the jar red and positioned a sad emoji as if looking up from the lid. For her artefact Alys slashed (with scissors) and screwed (with small metal screws) a clay tongue to 'capture the silence and torture of how society won't listen'. Under the tongue, she wrote: 'rape, racism, sexism, homophobia and transphobia'. She said the messages were about people trying to silence young people speaking out about these issues. During an interview in which EJ invited Alys to reflect on the project, she explained further:

> I'm that activist . . . like on Reddit, and Instagram and TikTok and stuff (. . .) I'm just like-I'd be trying to change their minds, ... I'm sick of being silenced. So, I was like, 'What can I do to put my words of how I feel out there?' So, like when I was making the tongue, I realised . . . like they don't let me talk, they - like they won't let me. So, I was like making a damaged tongue because that's what they've done to me, like they've stopped me from talking.

Figure 3. Bruised heart.

We found out that the Bruised Heart began as a rainbow heart to celebrate LGBTQ + communities. However, once alerted to the power of arts activism, Alys consciously changed tack. She said,

> So, if I can't say it out loud then I'll say it with art. So, I did and so that's when I was watching the film, and I was like, I generally started tearing (up) because it was it was - like, I don't know how to say it; she (Heloise, the artist) actually crawled into my mind ... I was originally ... I was going to paint a heart rainbow and then I was going to do cute little drawings, but then I realised, hmm. And then that is when I put the tongue on, and that is when, you know, like I put scissors in the tongue (...) like not going a normal tongue, a curved kind of tongue.

She explained that the curved tongue, inspired by the 'Attack on Titan Tongue' images and videos trending on TikTok, was based on the attacks she had received for her social media posts and comments on Reddit. She articulated the way the sounds and images Heloise had used to co-produce her film instantiate themselves into her creative processes enabling her to reveal a suppressed rage that had so far been difficult to express.

After making of the heart Alys talked about her personal experiences of being silenced and targeted on matters of sexuality and relationships. She talked about how the RSE project became

a lifeline, something she looked forward to, and sometimes the only reason she came to school. The workshops gave her a sense of belonging, enabling her to relax and create without fear of judgement. As the workshops progressed, Alys disclosed a strong relationship to feminist and queer poetry known on social media as *instapoetry*, linked to poets such as Rupi Kuar, Atticas and Amanda Lovelace. She started writing her own *instapoetry* in Year 7 (aged 11). Expressing her passionate views online seemed to enable her to cope with everyday and global oppressions. Here we glimpse a transversal connection to the activist legacy of her mining ancestors. Alys' oppression became visualised in the co-created film through an image of thorns piercing multiple hearts hanging from trees in a dark forest landscape. The beating heart seemed to incorporate contradictory entanglements with the affective landscapes where heterosexual relationships are reinforced by the gendered demarcations that haunt the valleys.

As Alys watched the Bruised Heart film again during the interview, she reflected on the heart bursting into flames at the end of the film. She explained how suppressed emotions can explode like fire. She said, 'It's like you've been through so much and then you're just—you explode and then—like it's on fire'. To EJ and the arts teacher who facilitated the session, the images in the film were reminiscent of flames, seismic ruptures, molten gold and hammering relating to the industrial landscape. In the final fleeting seconds of the interview, EJ mentioned this connection and Alys suddenly talked about her great, great granddad. Her great, great grandfather had pulled children from the spoil that had engulfed a school during the Aberfan disaster. He had been a miner.

The Aberfan disaster happened on the morning of October 1966, when a slag heap collapsed onto a primary school shortly after 9.00 am. Tonnes of spoil slid down the hillside submerging the building killing 144 people, of which 116 were children (Nield, 2014). The slag heap was one of several on the hill behind the Aberfan village where dumping spoil from the nearby mines had taken place over years. 21.1 million m^3 of spoil had been incrementally heaped onto the mountainside, which was known to be unstable. A river ran through the slag heap and according to locals it was only a matter of time before the tip slipped down the hill. The mountainside farmhouse and cottages at Hafod Tanglwys Uchaf that lay directly in the path of the slide were wiped off the map, killing everyone within (ibid.). 'The black slurry then hit the disused canal, fracturing the water main that had been laid along it, and leapt over the old railway embankment' (Nield, 2014, p. 89). The local miners had been telling the mine owners for a long time that the land was unstable and repeatedly warned of 'a disaster waiting to happen', but were not listened to. This failure to fully recognise both the forces of nature and the local people's knowledge that was behind the Aberfan disaster still echoes across numerous, ongoing mining accidents all around the world.

Emplaced Knowing for Environmental Education

Landscapes have agency—they move, compress, slide, subside, flow, spread and install themselves in human life. Communities develop ways of knowing across time due to the functional necessities of living and working on slopes, in valleys, underground, high up on mountains, on tundra, in deserts, with snow and on seas with specific climates. Yet, these ways of knowing are rarely valued. If people who take up positions of power are detached from the landscapes which provide the food, shelter and materials humans need to live by, then avoidable loss of life and habitat will happen. If we fail to listen to the people living closest to rock faces, within forests and around animal breeding grounds who have attuned to the rhythms, cycles and movements of nature, then we perpetuate a knowledge hierarchy of people who think they know and people who carry hidden, virtual, embodied, indigenous knowledge. This viscerally, embodied knowing of which one example is 'pit sense' is often dismissed as subjective and not scientific, abstract or rational. Yet, it

is only this kind of knowledge that will enable humans to co-exist with environmental disturbances.

We need to attend differently to our interdependence with the landscapes, soil, animals and microbes that sustain cycles of life and death. In the ruins of capitalism young people live and survive in multiple, contradictory, unstable and dynamic rationalities with distinctive landscapes. The many young people we have worked with in south Wales are already living with precarity. And, as Tsing (2015) argues precarity is a symptom of the lying promises of modern progress which characterises the lives and deaths of all creatures in times of the Chthulucene.

Many young people living in poverty live life at a different pace and confront more challenges than those more comfortably off. They have to improvise, hide, calculate and invent just to survive. Much of this is simply not known or recognised in schools; it is hidden knowledge. This knowing is hidden because being poor carries a stigma of not consuming, eating and speaking in the same way as the ideal neoliberal individual. They know and live precarity. They know loss both as near experiences and as immanent forces, which surface from time to time. This virtual knowing arrived as a profound silence which engulfed the room when Aled uttered the heart rendering phrase 'railway line'. It emerged when Alys suddenly, seemingly out of nowhere, mentioned her great, great granddad. Aberfan was evoked by the aesthetics of the film, connecting a present experience of not being listened to, with a history of local knowledge that had persistently been silenced. Vibrations across time zones arrive in classrooms as somatised grief and impassioned cries. These embodied, visceral messages contain warnings relayed by young people tapping into knowings that are more-than theirs. These cries are not just about individuals' concerns, they are hauntings territorialising bodies that are ours in common, and tell of unresolved troubles begging to be recognised. Not taking these warnings seriously, is not only to lack compassion, it is to endanger our very futures together on this planet.

Past hauntings are the virtual reservoirs of community knowing that sometimes, partially instantiate themselves in actual events. These knowings carry bonds of solidarity, care and loss. Yet, just as the girls danced to a different beat with Jen Angharad, so hauntings of loss and silencing live side by side with complex, contradictory, affective entanglements. We have consistently found that when given half a chance to express themselves, young people create artefacts that communicate how they feel, and sometimes tell us what to do. These micro-activist moments are eventful: infused with urgent messages.

History shows that minoritarian communities have been differentially valued in relation to neurotypical, white, majoritarian groups and at times have been judged as useful, exploitable, expendable, a burden or simply as waste (e.g. Ashurst & Venn, 2014). The devaluing of some people and their knowing is tied to capitalist values. The notion that if a nation produces enough wealth to pay for social services, amenities and infrastructures then all citizens will benefit equally has been shown to be a myth. The gap between the rich and poor is growing not diminishing. The Anthropocene critique of capitalism continues to position humans as above and outside nature perpetuating a conceit that science alone has the answers. In failing to fully recognise that 'Our being is tied to the rocks and other-than-humans that compose us' (Davis, 2018, p. 63) we continue to devalue a knowing that is carried though landscapes. This knowledge cannot be categorised or coded.

Emplaced knowing is embodied, thought-feeling, pre-personal, transversal and more-than-human that can only partially be grasped. Young people in post-industrial places are within the living reach of ways of knowing that came from working the volatile earth. This is an ontological immanence emanating from virtual community reservoirs that sometimes surface. It's a source of imagination, and much-needed diversity, of thought-feeling otherwise that might, just might, create liveable futures if educational and other institutions can listen. In this paper we have speculated about the potential of this kind of knowing as the basis for emplaced activism as an original and significant new approach to environmental education. It is an embodied, affective knowing that unsettles dominant curricular and scientific knowledge opening up possibilities for other ideas to be actualised. By tapping into the 'virtual' background forces that inform acts,

the universe gives us 'elbow room' (Massumi, 2011, p.21)—an emplaced activism to act differently from what was actualised in the past. So, we ask again, *what-if* environmental education and research attuned to young people's entanglements with post-industrial landscapes in areas of high poverty?

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