Appalachian Landscape and Architecture through the Lens of Extraction

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Abstract

Long considered by many historians as an "internal colony" (Haynes, 1997), the cultural landscape of the coalfields of McDowell County, southern West Virginia (USA) displays a palimpsest of political, social, cultural and environmental history. Drawing out some of the most valuable coal in the world, Pocahontas "smokeless" (McGehee, 2012), the grip of absentee landholders (Myers, 2008) on the region is reflected in legible traces on the land. Investigating remnant industrial terrain, modelled using LiDAR, brings patterns to the surface for interpretation and typological analysis (Opitz, 2012). From early mining forms, wildcat and prospect mines, to tunnel and later Mountain Top Removal (MTR), the morphology of the landscape evolved in line with machine technology and reflects the history of place. Communities constructed as work camps reveal an ordered geometry of control, a mnemonic of "corporate paternalism" (Garay, 2011); while the buildings of Gary, West Virginia, a US Coal and Coke Company model town evoke a Utopian efficiency and economy. Post-1950s boom time McDowell County counted 100,000 residents with cluttered Main Streets and overflowing rail lines. Today the population has dwindled to near 20,000 and the memory of early twentieth century industry in the "Free State of McDowell" is fast being erased either through neglect, abandonment or conscious elimination. MTR mining and the practice of filling valleys with waste rock obliterates topography at an unprecedented scale. Abandoned camps are washed away from the floodplain or intentionally removed. Smaller scale mining operations are swept away as new technologies raise the economic viability of thin coal seams. As the landscapes, communities, and buildings of McDowell County are reorganised and reshaped, a methodology for analysis through remote sensing and ground-truthing (Doenus et al., 2008; Gallagher & Josephs, 2008; Horne, 2009) informs interpretive strategies in capturing narratives of place.

Keywords: Cultural Landscape, Industrial Landscape, LiDAR, Interpretation

Historical, environmental and social context

Landscape archaeology is concerned with the interpretation of a chosen landscape as a cultural production reflecting a specific cultural moment, examining the shaping of the landscape for a particular purpose to derive meaning. The primary agent of change within the cultural landscapes of McDowell County, West Virginia is coal mining and associated industrial development. The geomorphology of McDowell County is defined by the steep mountains, a landscape characterised by deeply incised highly dissected ridges and valleys cut from an ancient seabed plateau. When Captain Isaiah A. Welch first surveyed this area of Western Virginia in the mid-nineteenth century, he saw it as a wilderness of sparse settlement, Shawnee Native American trails and he found easily accessible...
coal, the Pocahontas Seam of the Flat Top region. The deep coal seams reaching thirteen feet thick in some areas of the Flat Top region were easily accessible having been revealed by alluvial erosion over time and allowed for adit and drift mining practices. Delivering the coal to market and establishing towns for the mineworkers were the core challenges in developing McDowell County; the establishment of the Norfolk and Western Railroad’s Ohio Extension met the first challenge and in the late nineteenth and early twentieth century the second was met by establishing over fifty “coal camps”, many of them company towns.

One of these camps, Gary, now an incorporated town (currently including unincorporated places—Elbert, Ream, Filbert, Thorpe and Wilcoe), was a significant component of US Steel’s integrated industrial complex. Named after Judge Elbert Gary, US Steel founder, the camp was constructed by USCCC, a subsidiary of US Steel, in order to tap the resource wealth of the region and bring those resources to steel fabrication facilities, primarily in Pittsburgh, Pennsylvania and Gary, Indiana. The series of towns were considered “a truly exceptional” company community development (Sone, 1991: 5) with a small settlement built for each of the complex’s twelve mines. Development of the mines and towns began in 1902, establishing company buildings, homes, infrastructure and industrial facilities within the relative wilderness. The forest was cut and timber was formed to lumber at the company mill. At other company towns in McDowell County, housing was delivered by rail and assembled rather than being built from the local resources. USCCC engineers, architects and draftsmen created multiple house designs fitting the needs of workers, miners, supervisors and executives. Including these resources sought to enhance the quality of life of resident workers.

Recognising the need to build communities that would support a relatively high quality of life in order to avoid labour issues and to attract a quality workforce, the company provided churches, company stores, restaurants, schools, clubhouses, athletic fields, and other recreational facilities such as tennis courts and a movie theater (Sone, 1991: 6). Company buildings were constructed in stone by Italian stonemasons, as were roadway retaining walls, bridges and structures. For executives and supervisors of the coalfields, USCCC constructed a clubhouse and golf course at Black Wolf and a company doctor established a back-country hunting resort, Sand Lick Sportsman’s Club now known as Miracle Mountain. US Steel executives had visited coal mining and processing facilities in the Ruhr Valley of Germany and modelled their own towns on them (Garay, 2011: 39). Gary was at the centre of the largest mining operation in the world (Schust, 2005: vi) and was to be built as a model industrial facility.
Narratives and Legibility, Theory and Techniques

As a “place” McDowell County and the incorporated town of Gary, West Virginia reveal multiple landscape narratives (Pottinger & Purinton, 1998) that are tied closely to the industrialisation of the United States and the development of extractive industries in the Appalachian Region. Gary is included in the US States National Park Service’s (NPS) National Coal Heritage Area (NCHA) whose core interpretive themes include five which are central to this paper – the Business of Coal Mining, Working in Coal, the Company Town, Mining Technology, and Crisis and Renewal. Reading the cultural landscape of Gary, West Virginia is tied to the legibility and interpretation of remnant landscapes, communities and buildings as material culture. The diminution of evidence for these narratives of mining is tied broadly to the Anthropocene (Zalasiewicz et al., 2010). After World War II, mechanisation lowered mining-related employment and created an acceleration of landscape degradation and change. In particular, Mountain Top Removal (MTR) mining and the practice of filling valleys with waste rock obliterates topography at an unprecedented speed threatening historic patterns of development. The scale of these interactions outweighs the previous scratchings of the surface that were created by early twentieth century industrial practices when underground adit and drift mining dominated. Nowhere else in the US (and potentially the world) are the human geomorphological impacts of the Anthropocene more evident. The mining region of the US, West Virginia and the southern West Virginia coalfields have been identified as an epicentre of human geomorphological impacts (Hooke, 1999: 687).

The works of Yentsch (1996), Yamin & Metheny (1996), Branton (2009) and others argue for place-based research that blends subjective and objective analysis. Cultural geographers borrow from literary theory and criticism describing the landscape as a text that can be read and interpreted (Barnes & Duncan, 1992). Applying hermeneutics, or interpretive actions, to place-based research attempts to generate a broader and potentially more profound understanding of, in this case, Gary, West Virginia. The cultural landscape of Gary, West Virginia as a palimpsest may be read as a text and interpreted in many different ways focusing on a variety of literal and figurative phenomena. A framework for these activities is drawn from, in particular, Carl Sauer (1963) and John Brinkerhoff Jackson (1984), among others. Pierce Lewis (1982), a cultural geographer provides a set of distinct rules or principles for the interpretation of cultural landscapes that have guided research in the field. First, as previously stated, landscapes are read as a clue to culture: who we are and who we are becoming.

Also instructive is the more quantitative methodology presented by the NPS for performing cultural landscape research, “A Guide to Cultural Landscape Reports (CLR)” (Page, Gilbert & Dolan, 1998). The framework provides a comprehensive system for exploring landscape with the purpose of determining management strategies for cultural landscapes in the NPS. The landscape characteristics of the CLR framework include natural systems and features, spatial organisation, land use, cultural traditions, cluster arrangement, circulation, topography, vegetation, buildings and structures, views and vistas, constructed water features, other small-scale features and, of course, archaeological sites (Page, Gilbert & Dolan, 1998: 53). These landscape characteristics may be mapped and distilled or isolated from a complex landscape in order to analyse their form, meaning, integrity and interactions with other characteristics and components.

The scale of the study area for the work described here – a small unincorporated “place” within Gary named Elbert – leads to an analysis of larger-scale landscape characteristics, primarily natural systems and features, spatial organisation, land use, cultural traditions (especially patterns of division), circulation, topography and constructed water features (utilitarian functions). To this area was applied LiDAR-based modelling. Aerial LiDAR data was collected for McDowell County through a West Virginia Department of Environ-
mental Protection funded research project within the twelve "coal counties" of West Virginia. Data collection, processing and analysis were completed by the Natural Resources Analysis Centre (NRAC) of the Davis College of Agriculture, Natural Resources, and Design at West Virginia University (WVU). Ground-based static LiDAR (Faro Focus) was used to capture sites, buildings and elements. In addition to the aerial and ground-based LiDAR pointcloud model other sources were added to the modelling process, especially in integrating historical data. Integrating and georectifying historical maps (such as US Geological Survey Maps from 1926 and US Coal and Coke Corporation [USCCC] Underground Mining Maps of the 1940s) sought to qualify and quantify areas that had been lost due to dereliction, removal or demolition, or later large scale mining operations. GIS shapefiles showing coal seam locations, roads, railroads, places and contemporary surface mine permit boundaries and valleyfills were also added to demonstrate proximity of potentially threatening land use to the historic landscapes.

**Historic and Contemporary Patterns at USCCC No. 8 Mine and No. 8 Mine Coke Ovens**

The study area – a small "place" within the complex of Gary again, after Judge Elbert Caryl named Elbert – was chosen because it epitomises USCCC developments and allows for construction of a diverse set of narratives for consideration. The town was built to support No. 7 and No. 8 Mines, both coke production facilities. Elbert was reached by the Norfolk and Western Railroad in 1904; a post office was officially designated in 1908 and by 1910 approximately 2000 people lived there, the two mines employing 436 individuals of whom 60 percent were immigrants (Schust, 2005: 409). Community facilities (mostly segregated for Caucasian and African-American residents) constructed from 1904 to 1928 included restaurants, schools, a barber shop, recreation centre, dance hall, pool hall, theatre, company store, four churches, a water treatment facility, an emergency hospital and a club house. As a "typical" cultural landscape, Elbert, with the No. 7 & No. 8 Mines, includes many landscape types: an underground mine, roads, railroads, pedestrian ways, a beneficiation (refining) facility, coke ovens, residential districts, areas of worship and commercial developments.

Analysis using many of the CLR components listed above was applied to three selected focal areas: the USCCC No. 8 Mine site, a neighbourhood residential block in Elbert on Miracle Mountain Road (County Road 13) and the USCCC No. 8 Mine coke ovens.

**Natural Systems and Features and the Integration of Built/Natural Systems**

The above-ground patterns of Elbert No. 8 Mine and neighbourhood landscape follow natural systems with development flowing with river and stream channels, ridgelines and valleys (figs. 1.2 and 2.2). Limited by topography most development occurred in floodplains. Steep slopes and narrow valleys allowed only limited linear insertions: the road, railroad, terraces of coke ovens and terraces of housing. The curved cultural forms adapting to the landscape above-ground are in direct contrast to the orthogonal grid below ground (fig. 1.5) where rigorous geometry creates a high level of contrast. The horizontal layering of pliable sedimentary stone and the thick seam of the Pocahontas #4 coal seam – elevation 1700 ft, seam at 6 ft 4 in, BTU 15,332 (Schust, 2005: 420) allowed the strict engineering and underground connections through the mountain. The materials derived from local natural systems are clearly visible in the coke oven and home construction. LiDAR modelling of the No. 8 Mine reveals natural systems such as water reconfiguring the topography of the landscape after eighty years of abandonment (fig. 1.8). Succession of forest vegetation post-disturbance is clearly observed through the aerial photo and the progression of time between the neighbourhood landscape context in 1923, 1952 (figs 2.1, 2.5 & 2.7) and the present.
Spatial Organisation (Community “Planes” Scale, Order, Hierarchy and Discipline)

Elements that define the organisation of space – the railroad and roads – are primarily within the ground plane (figs 2.2 & 1.2). The slope is broken by a stone retaining wall. The railroad right-of-way, raised slightly above the roadway, then follows the highway. Up the valley the single rail widens to three tracks, now a staging area for railcars (fig. 1.5). A narrow shoulder and lawn leads to residences and stone retaining walls meet the opposite slope (figs 2.1 and 2.5). Efficiencies are clear in the tight margin defining the developed areas all parallel and tied to the slope break of the valley. Homes sit less than one metre from the retaining wall creating a narrow gap. Edge is defined by stone retaining walls, built topography grasping limited space from the mountain. Hardwood forest is located above housing. Examining the arrangement of elements creating the ground plane, the sense of a distribution of planes in relation to the components of the integrated industrial complex is clear. At the mouth of Murphy Fork [Coon Hollow] (fig. 1.2) a coal washing plant (fig. 1.7) built in 1931, served as a centre. Today, the site (fig. 1.8) is a coal storage area, a moving terrain with inputs and outputs reshuffled daily. Overburden (fig. 1.6) was conveyed up the slope and deposited as valley fills to build level planes. In the early twentieth century, the overhead plane would have been cleared (fig. 2.7). Today, the regenerating forest provides filtered light.

Cultural Traditions (Patterns of Division, Built Forms and Materials)

Industrial production and economy influenced and controlled the land uses (in concert with natural systems and features) as well as patterns of division. The residential building forms represent some of the twenty-eight “types” designed for Gary. The Italianate commercial buildings tie to railroad town development in the late nineteenth century and early twentieth century. The materials were all locally sourced with timber milled in close proximity and quarries developed for the manipulation of stone by Italian stonemasons. The remnants of quarrying demonstrate the cut and fill, the extraction, processing and application of highly crafted infrastructure. The layering and terracing of housing (figs 2.4s & 2.5) reveals the socio-economic hierarchy established in Elbert and throughout Gary with the workers’ homes (single-storey duplexes, two conjoined family houses) occupying low ground and the managers’ homes (two-storey, single family) built high above out of the mêlée.

Land use (Subsurface [Chthonic] Mine Structure/Surface Infrastructure – Adit/Drift/Landscape)

Within the Elbert No. 8 Mine landscape land uses of the “active” era were a complex industrial and social machine. Industrial land uses here included: coal extraction, conveyance, preparation and beneficiation, coke production and transport. Furnaces – 172 in 1907 – transformed coal to coke, men and machines loaded and shipped materials. Coke ovens produced 675,000 tons of coke between 1907 and 1921 when they were shut down (Schust, 2005: 420). Social uses included recreation in a clubhouse, kitchen gardening in the landscape between the home and Murphy Fork (fig. 2.7). A commercial building stood at the corner (fig. 2.5) and residences follow terraces above the roadway (figs 1.2 & 2.2). With much of the industrial and social uses dormant today, patterns are revealed in the footings of buildings, scaled for uses at specific locations, the alluvial fan of the stream for industrial, the corner lot for trade, and streamside for garden plots.

Circulation (Road And Railroad (Subsurface/Surface, Distance and Connectivity))

Because the roadways followed waterways, the flow of the water defined above-ground circulation
(fig. 1.5). Twelve-foot wide highways, limited by the sectional constraints of the valley, are lined with sidewalks that brought workers the short distance to the mines and coking facilities (fig. 2.8). The railroad hugged the steep 70 percent slopes. Multiple lines at the terminal allowed for waiting cars and for servicing of engines. The flow of rail lines above-ground contrast in their curvilinearity with the axiability of those underground (fig. 2.7). Miles of drift mine tracks opened into the sinuous valley where coal for conversion to coke was tipped into ovens by way of structures known as “tipples”. A portal leading from the No. 8 Mine to facilities in the neighbourhood of Elbert connects the two areas together. During consolidation in the 1930s, coal washing was halted at the No. 8 Mine and coal loading facilitated at the No. 9 Mine. The lines tying the mine opening to the coke ovens were located above the ovens for easy loading into the ovens and a lower opening to unload (fig. 3.4).

Topography (Mountaintop Removal/Drift, Valley Fills)

The cutting from the mines, beneficiation and waste rock provides the greatest shifts in topography. When overburden from below is brought to the surface the hollows of the mines fill with gas and, over time, water. The core excavation of flat, layered symmetrical paths and rooms becomes valleyfill overburden slag above-ground. Sharp cut hillsides (fig. 1.7) at the industrial peak erode to hummocky hills (fig. 1.8) of surplus coal. Internal surfaces within the mountain (Maxwell Gap) from Elbert No. 8 Mine (assigned underground 1,420 acres or 575 hectares) provided 5,433,539 tons of coal in the years of operation (Schust, 2005: 421). Externally the volumes of waste materials are comparable to the quantity of coal extracted.

Constructed water features (armoured natural systems, industrial uses)

Mine drainage was channelled from an opening above Murphy Fork of Sand Lick Creek and drawn down to the main stem of the creek. The Murphy Fork flows between steep ridges then is submerged in a culvert, buried, under the hummocky coal piles (fig. 1.8). The flow reaches retention ponds from the early twentieth century that still supply water to mining operations at the former washing plant location (fig. 1.7). Murphy Fork moves along the hillside adjacent to the railroad and opens into Sand Lick Creek at Miracle Mountain Road and County 13. Here the waterway is armoured on either side with stone retaining walls, demonstrating the craft of the Italian stone-masons. Revealed at the confluence crossing is a rusting pipe two feet below ground level and three feet above stream flow level. The pipe follows in parallel the railroad, road, sidewalk and orientation of adjacent housing.

Summary Interpretation

From the above descriptions and interpretations arises a narrative of extraordinary order and planning. The engineering of Elbert No. 8 Mine fits cleanly and tightly within the landscape context. There is a sense of “biomimicry” (Benyus, 2014) of systems adapting and attuning to the environment, and an elicitation of architectonic principles (Ching, 1996) that demonstrates cultural integration in the landscape. The engineered systems above ground are responsive to existing natural systems in their curvilinearity and roundedness providing resiliency and flexibility within the closed system (Vogel, 1998). Though the materials are stable the linear forms coalesce with endemic patterns. The landscape provides the overall spatial organisation above-ground. While the primary industrial development did not seek to transform but rather to integrate, contemporary operations greatly ignore natural conditions in filling, flattening and opening. Historically the points and planes
Fig. 2 See caption on page 9.
of development were concisely fitted within the narrow spatial volume characterised by enclosure. The multiple centres (commercial hub, community clubhouse and washing station) were defined by the openings of hollows at the confluence of streams. The adit is located at the point of least resistance, the slopes defined by the angle of repose. Curvilinear forms extend outward from centres in an ordered rhythmic ribbon of repeated domestic forms, rail lines, ovens, rail lines, roads, fortified waterways, domestic space, retaining wall, domestic space, retaining wall stacked upon terraces from low to high. Visually and scenographically, the journey and approach is defined by the focal point in the distance, a hierarchy of uses defined by scale. The paths move along the edge of spaces providing a high level of connectivity. The backdrop takes the form of a hillside. The datum or overall pattern remains defined by the mountains and forest which rapidly draws back the industrial landscape to nature.

Specific Themes and Interpretation

Interpreting the multiple select narratives that the National Park Service promotes for the region – the themes referred to above – may be achieved through overlaying of historic maps (topographic and underground) with LiDAR-generated hillshade models and aerial photography to create three-dimensional visualisations that capture historic conditions through reconstructions and reveal present day hidden traces, remnants and ruins. The NPS theme of the “business of coal mining” is revealed in the interconnected economic model that arises in crisp contour in the patterns of the landscape, that of “working in coal” in the community form and fading circulation systems that defined the work day for miners and the interconnected social life of Elbert and the No. 8 Mine. The neighbourhood landscape model reveals the narrative of “the company town” demonstrating the strict ordering of development, the spiritual, recreational and commercial hubs that facilitated a moderately high quality of life attracting settlement. The “mining technology” theme can be seen in the various innovative approaches to mining coal and coking within the No. 8 Mine landscape, and today through the MTR and valleyfill phenomenon. In comparing the “built up” conditions in Elbert present on the 1926 USGS maps with the removal of housing and other facilities overtime the theme of “crisis and renewal” is revealed. As these models are refined, an immersive narrative approach to interpretation becomes feasible in the three-dimensional digital model.

There can, however, be alternative narratives. In an area as socially and economically distressed as McDowell County major mainstream heritage
Fig. 3 See caption on page 11.
tourism and rehabilitation of resources are unlikely. As a remnant landscape that embodies the narrative of industrial patriarchy (of US Steel and Judge Gary, but also of such American figures as Andrew Carnegie and Henry Ford), the cultural landscape of Gary, WV provides a potential venue for “dark tourism” (Stone, 2006). Touring the ruins of company stores, banks, clubhouses and the ironic Black Wolf golf course could reveal the unrelenting power of wealth, capitalism and the martyrdom of the mining class. The meaning of “ruins in the landscape” is fluid for each individual though the overall theme of industrialisation of the United States is consistently communicated in Elbert. In contrast to the architectural monumentality and preservation philosophy of the Ruhr’s Industrial Heritage Route, much of it consisting of heritage contemporary with that of Gary, the southern coalfields lack substantial investment. With a critical landscape view the narratives from the work of Robert Smithson (1996) in capturing evocative industrial scenes (the “new monuments” of Passaic, New Jersey), from J.B. Jackson’s (1980) evocation of revealed political disparities expressed in ruin, from Grady Clay’s (1994) image of humanity’s products, now ruins, as culture returning to nature, and from Robert Harbison’s perception that a “place” might express the moment when “historical wealth becomes a rubbish heap” (Harbison, 1991: 100) are meaningful. As memories and material traces begin to fade away, as the forests regenerate and new economies are introduced to vitalise the region, and as a new population settles in and entrepreneurial energy is invested, so the memory and stories of the largest coal mining operation in the world merit record and narration to subsequent generations.

References


Harbison, R, 1991: The built, the unbuilt and the unbuildable, Thames and Hudson, Singapore.


Jackson JB, 1984: Discovering the Vernacular Landscape, Yale University Press, New Haven, CT.


Schust AP, 2005: Gary Hollow - a history of the largest coal mining operation in the world, Two Mule Publishing, Harwood, MD.


Yamin R & KB Metheny (ed.) 1996: Landscape Archaeology: Reading and Interpreting the American Historical Landscape, University of Tennessee Press, Knoxville, TN.

Yentsch AE, 1996: Introduction: Close Attention to Place-Landscape Studies by Historical Archaeologists, in Yamin R & Metheny KB (ed.), Landscape Archaeology: Reading and Interpreting the American Historical Landscape: XXIII-XLII. University of Tennessee Press, Knoxville, TN.