North East England and the Climate Crisis

From Cause to Effect

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2019 & 2020

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Coda The North East England Climate Coalition

Preface and summary

In 1984 I returned to the North East as Director of Northern Arts after 20 years learning my trade as a project developer and manager, teacher and policy analyst in the arts and culture around the UK. In the mid-1990s I served as Special Projects Adviser to Gateshead Council on the Baltic Gallery, the Millennium Bridge and what became Sage Gateshead and then moved to Northumbria University as Professor and Director of the Centre for Cultural Policy and Management in 2000.

In that capacity I developed a sister Centre in Johannesburg and, on relocation to South Africa, my own consultancy and a formal cultural exchange partnership between the North East and the Eastern Cape. 'The Swallows Partnership/Sihlanganiswa Ziinkonjane' supported exchanges and joint projects in the arts and in the role of culture in regeneration between 2004 and 2014.

This paper had a long slow gestation that begins during that time in South Africa when a growing interest in Xhosa history and society led me to recognise similarities between the Bantu concept of Ubuntu in Xhosa culture and the politics and communitarian values that had underpinned much that had been (and to a surprising degree still is) distinctive about the North East. There were also tantalising stories of direct linkages between our two parts of the world whether through warfare (the 100 year 'wars of dispossession' Britain fought with the Xhosa) or merchant and farmer settlers or the mines and the railways or the missionary schools and Nelson Mandela[i].

In 2010, I asked Bill Lancaster (my friend and mentor on my long journey into the history of the North East) for a book on the 'Geordie Diaspora' of the 19th and 20th centuries and we failed to find one. In 2012 we found a lens through which to view the subject in the records of the membership of the Royal Chartered, North of England Institute of Mining and Mechanical Engineers (NEIMME https://mininginstitute.org.uk/) dating from its foundation in 1852 and – at that point - still the owners of its extraordinary headquarters building in the centre of Newcastle (Pages 12-14).

The Heritage Lottery Fund provided financial support and 'Mining the Institute' ran as a programme of events, lectures and research at the Institute from the summer of 2013. What became clear was that, whether in South Africa or elsewhere in the world, the engineers and skilled workers of the Great Northern Coalfield had spread rapidly across the globe. They were the necessary advance guard of the global industrial revolution, finding, mining and transporting to the ports and indigenous industries the fuel it required.

In 2015, my interest in the future of the Institute was rekindled when Tony Pender, a member of the Institute Council and another long-standing friend and guide, told me that the Institute was on the point of having to sell its building. I was invited to propose an alternative Development Strategy by the NEIMME Council. We secured developmental funding from HLF and I was appointed as Development Director to raise the funds required for the complete renovation of the building and a restructuring to secure the building and archive for the long term as 'The Common Room of the Great North' (https://thecommonroom.org.uk/). The Common Room is now scheduled to re-open in the summer 2021 under the leadership of Chair, Matt Boyle and CEO, Liz Mayes.

During 2018, and with many others, I became increasingly aware of the global need for the most urgent action to address the climate crisis and an observation by the American author, Barbara Freese, in her book 'Coal. A Human History', catalysed a connection with my earlier work.

Barbara Freese observed that the extraordinary achievements of the engineer entrepreneurs of the North East in the 19th and early 20th centuries were directly linked to the causes of the contemporary climate crisis. In a memorable quotation, she wrote that it was the engineers of the Tyne and Wear ***'who released the genie of coal into the world'.***

The result of the connection being established was the first draft of this paper which then evolved rapidly over the next 12 months as it interacted with the very many people and organisations that contributed to its contents and combined to help to realise its ambitions.

In Summary, the paper that follows:

- ***describes the North East's leading role in developing the technologies of deep mining, the railways and the coal fired power station and then exporting them around the globe, creating - albeit inadvertently - the bulk of the greenhouse gas emissions that are the principal cause of today's climate crisis;***
- ***asks whether that unique heritage could provide a taproot to the societal and political energy needed here to achieve a just and effective transition to a low carbon economy regionally and support advocacy for the same to be achieved nationally and globally;***
- ***suggests that – in doing so - we could also draw on:***
    - ***the lessons learnt from the consequences of those industries here for economy, society, environment, and health,***
    - ***the radical public policies and politics that flowed from those consequences alongside a reassertion of the communitarian values that underpinned them,***
    - ***the foundational work of the UN and, in the UK, on the government's advisory Committee on Climate Change whilst acknowledging growing evidence that even more radical action may be required;***
- ***proposes a whole-regional and cross-sectoral approach (with the local and combined authorities providing democratic legitimacy to any structures that were created) to deliver projects that could best or only be achieved, under principles of subsidiarity, regionally.***

The paper was introduced informally to potentially interested individuals connected to the region's institutional infrastructure, garnering support and commitment. In July 2019, VONNE (Voluntary Organisations Network North East https://www.vonne.org.uk/), its Chair, Sir Paul Ennals and CEO, Carol Botten, accepted the role of convenor. I was contracted as Interim Climate Project Leader. It is presented here in broadly the form it had reached by the end of that year.

It is, however, a pleasure to record here that - despite the impacts on civil society of the pandemic – a Steering Group for the North East England Climate Coalition (NEECCo) was established early in 2020 with a draft statement of Vision, Mission and Aims now agreed and in the Coda for reference.

A formal launch of what will be the first such fully cross-sectoral regional body in England is now anticipated early in 2021. (https://www.neecco.org.uk/).

Peter Stark
15th January 2021

1] Climate Change and the future of our world.

The United Nation's 24th 'Conference of the Parties' in Katowice (COP24) in 2018 confirmed the targets for greenhouse gas reductions by 2030 established in Paris in 2015 and then, due to be reported against at COP26 in Glasgow in November 2020 (now 2021). Those targets – intended to achieve net zero emissions and limit warming to 1.5 degrees above pre-industrial levels by 2050 - were the minimum thought to be required to avoid catastrophic environmental damage by then and disaster by 2100. The UN International Panel on Climate Change (IPCC) report to COP24 indicated, however, that current trends saw increases of between 3 and 5 degrees by that time.

It was of grave concern that, as it has continued to be published, new research confirmed both that the Paris targets are now inadequate and that far too many (and too many of them major) national contributors to greenhouse gases were falling far behind their own targets. Faced by this global climate emergency, national governments appeared too often to be objectively in default and politically in denial.

The International Panel on Biodiversity and Ecosystem Services (IPBES) found that 1 million species were at risk of extinction with climate change a significant factor. The IPCC report on the Oceans and Cryosphere paints a similar if not darker picture in relation to the warming of the oceans, the thawing of permafrost and the loss of ice cover at the poles and, particularly in the Arctic.

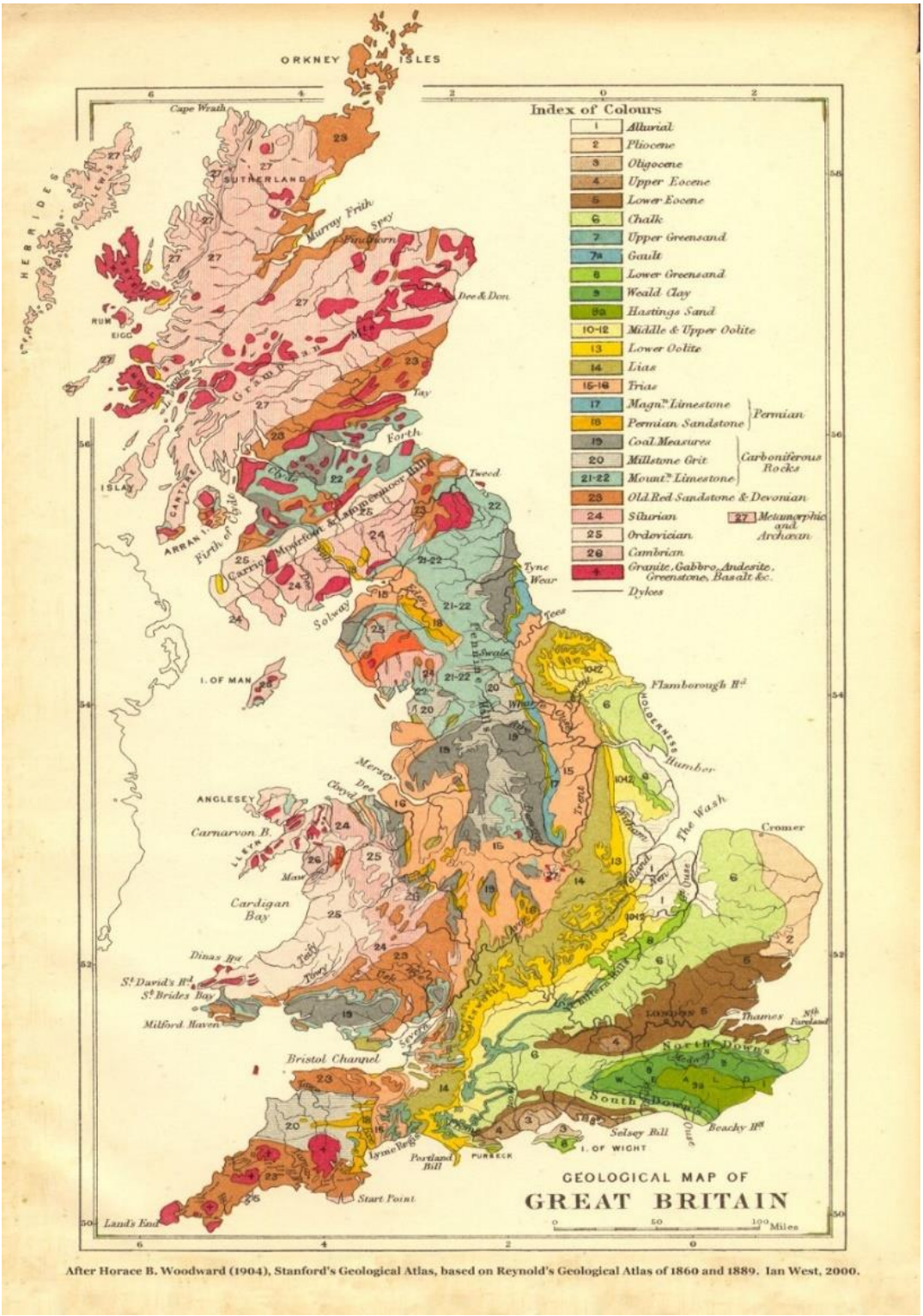
The IPCC report on Land and Food security detailed how a vicious cycle is underway, where degradation of land through intense farming, coupled with deforestation to free up more land for agriculture, is fuelling the release of more greenhouse gas emissions which in turn is driving further land degradation. If demand for food, animal feed and water continue to increase, combined with more resource-intensive systems of consumption and production, the world will be at severe risk of declining crop yields, increased food commodity prices, reduced nutrition, and potentially major disruptions to food supply chains.

In opening the COP25 in Madrid at the end of 2019, UN Secretary General addressed the centrality of coal and coal fired power stations to the climate crisis.

> **"Three major reports from the Intergovernmental Panel on Climate Change – on land, on the oceans and cryosphere, and on the 1.5 degree Celsius climate goal – each confirm that we are knowingly destroying the very support systems keeping us alive. And indeed, we are. In several regions of the world, coal power plants continue to be planned and built in large numbers.**
>
> **Either we stop this addiction to coal or all our efforts to tackle climate change will be doomed. And, as the UN Environment Programme has just revealed, countries are planning to produce fossil fuels over the next decade at over double the level that is consistent with keeping temperature rise to 1.5 degrees Celsius"**
>
> **UN Secretary General, Antonio Guterres**

2] What part did the North East of England play in the causes of the crisis?

North East England is essentially the historic counties of Northumberland and Durham reaching from the Tweed on the Scottish border to the Tees Valley on the border with Yorkshire. The Region is divided by the River Tyne but underpinned and profoundly connected for over 300 years – literally, economically, culturally, socially and politically – by the Great Northern Coalfield.



After Horace B. Woodward (1904), Stanford's Geological Atlas, based on Reynold's Geological Atlas of 1860 and 1889. Ian West, 2000.

Across those three centuries, that coalfield produced millions of tons of coal with many multiples of that extracted and burnt in the UK[ii] and around the world using technologies developed here in the North East that:

- made possible the profitable deep mining of coal at scale,
- transported that coal from the pithead to the hearth and the furnace via the rivers and the seas, using the railways, bridges and steam colliers that were designed and built here,
- turned steam power into electrical power for industry and the home, via the steam turbine and the coal-fired power station.

It is sobering that circa 50% of the greenhouse gases now in the atmosphere have been produced in the 50 years since the science demonstrating their impact was available. A substantial part of the earlier and balancing 50% was released during the early years of the Industrial Revolution that can be argued to have its earliest beginnings in the North East at the end of the 17th century.

The spread of 'carboniferous capitalism' around the world in the 19th and 20th centuries appeared to offer the prospect of cheap energy, power and prosperity for all, and it did indeed provide unimaginable benefits globally over time (and vast fortunes to a few) but – as is now known - at a potentially deadly price to humanity and our planet's ecology.

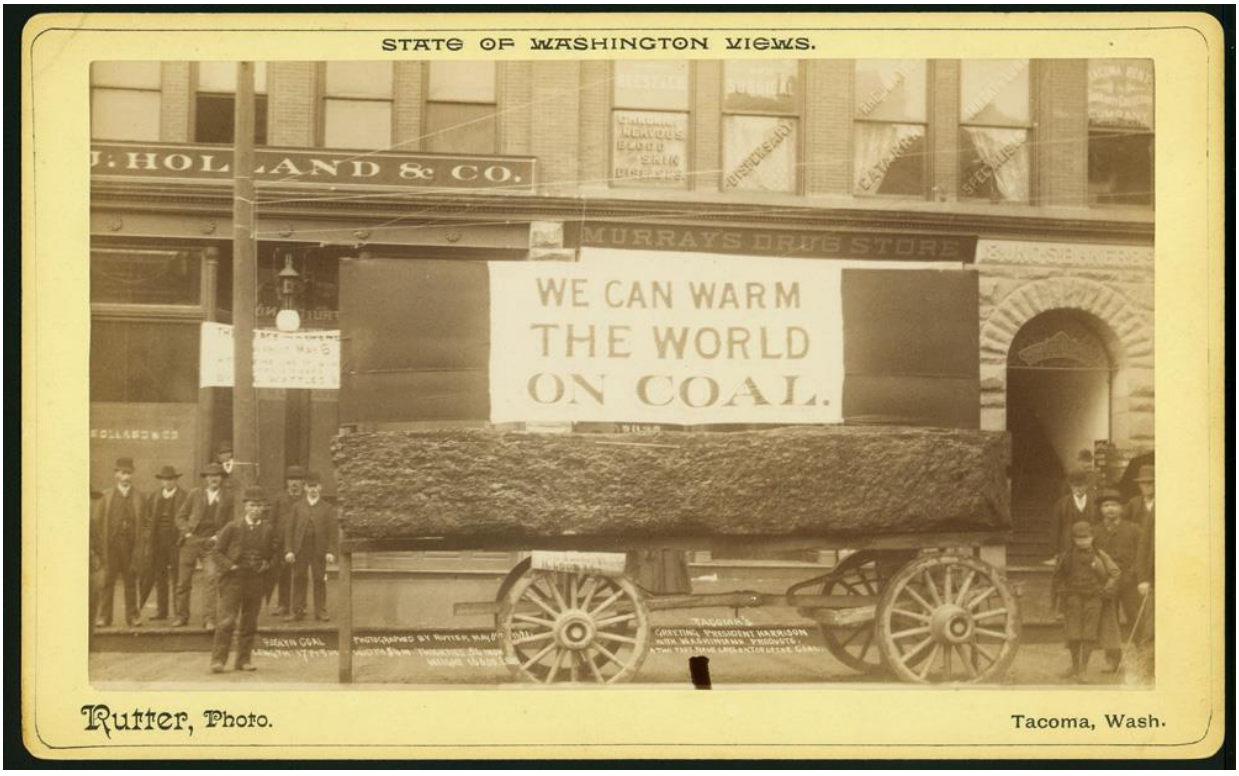


Image from the collection of the Washington State Historical Society

The pits of the North East were essentially closed before the evidence of linkage to global warming was fully in place, but it was the engineers of the Tyne and the Wear who 'released the genie of coal into the world'[iii].

3] The 18th century. From iron works and waggon ways to early steam power.

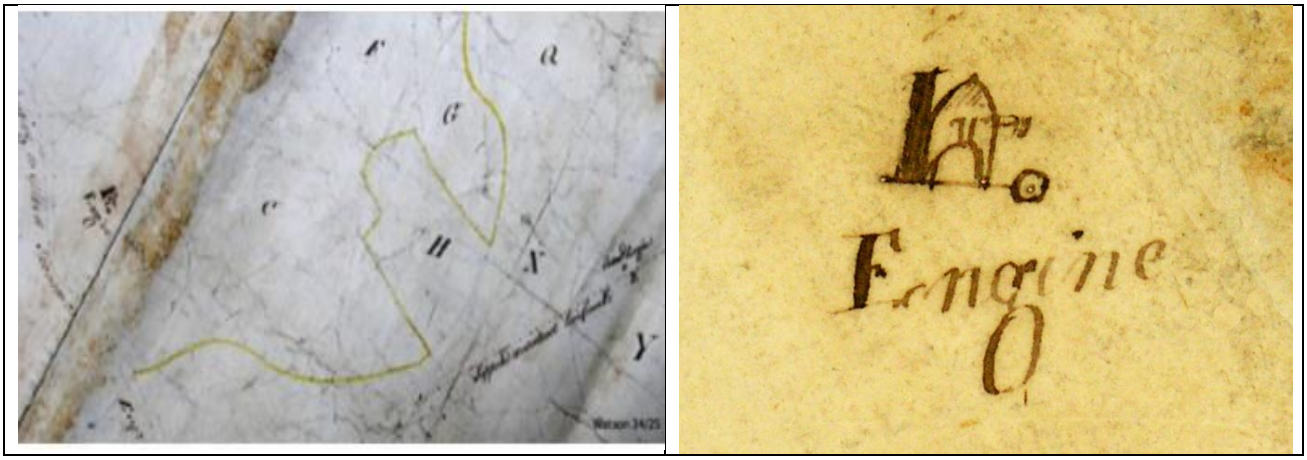
There is a strong case to be made for the North East to be the holder of the disputed title of the 'birthplace' of the Industrial Revolution.

At the end of the 17th century Crowley's Iron works in the Derwent Valley (well before other contenders for the title) employed 1,000 men on weekly wages, creating the world's first industrial proletariat producing nails, chains and anchors for the Navy (as well as manacles and hoes for the slave trade. As with many aspects of our National and regional history there is darkness as well as light)[iv]. What cannot be disputed is that the region was the birthplace of the technologies that got and distributed the coal that fuelled and powered the Industrial Revolution around the globe.

At the start of the 18th century steam power, in the form of the Newcomen engine for pumping water from the mines, was installed at Tanfield Lee (1715), Washington and elsewhere in the coalfield which enabled production to increase to almost two million tons by 1750. 1715 also saw the clarification in law that – whilst the owner of the land was the owner of the coal beneath it, the tenant farmers enjoyed rights under Common Law in that the:

"tenants or farmers of the collieries by themselves, their workmen, servants or agents time beyond memory, have enjoyed and ought to enjoy the right to sink pits, work ye colemines and collieries under ye same, and to lead away the coles gotten, and to do every other needful and necessary act for the winning and working thereof, paying reasonable damages to the owners of such lands[v]"

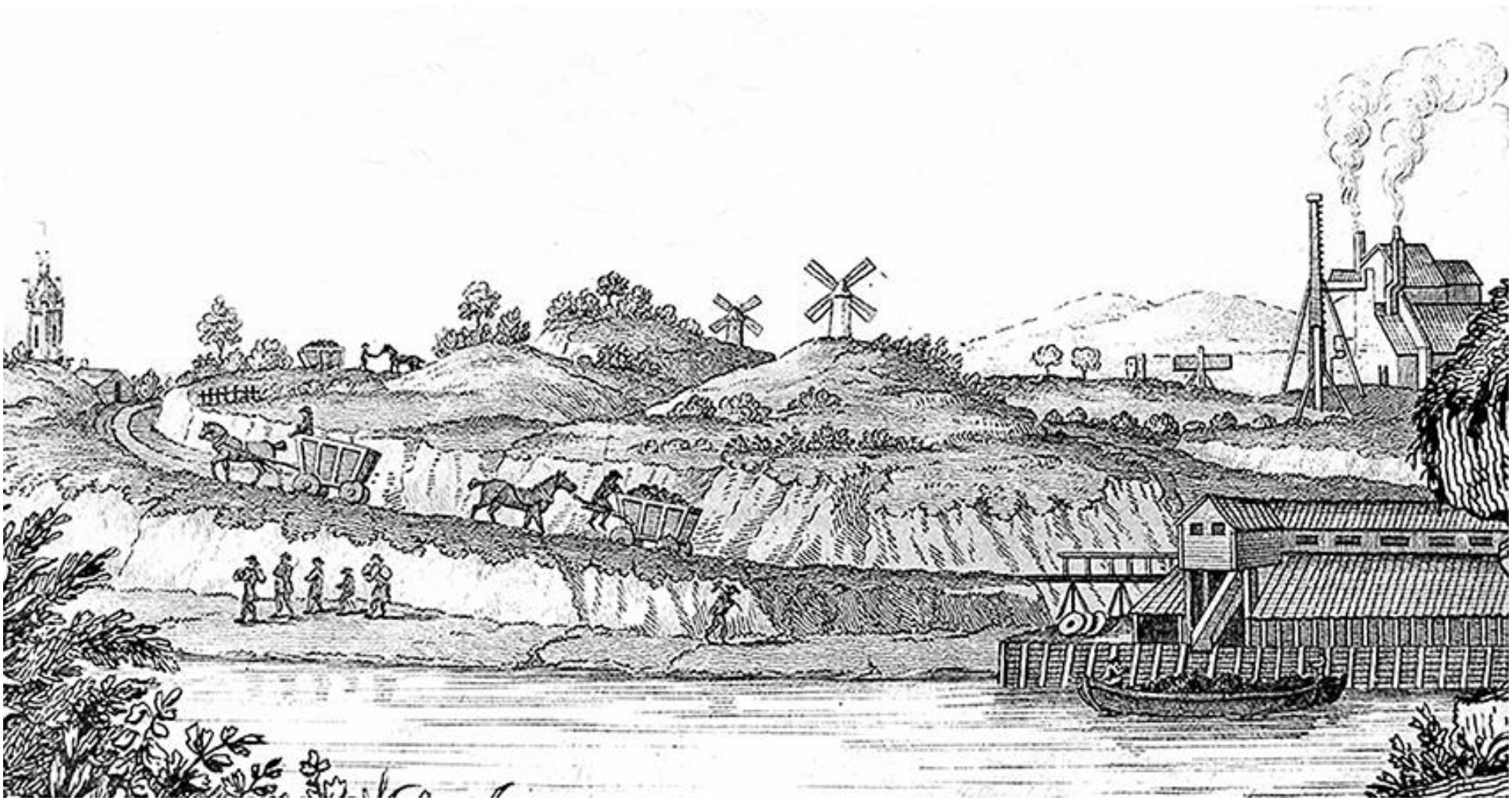
At this stage most of the coal was transported down the east coast to East Anglia, London and the South East from pits via first waggon-ways, then keel boats and finally sailing colliers. Mining was still an essentially rural activity integrated into the farming year of tenant farmers as illustrated – in an etching by Thomas Bewick - in 1787 on the next page.



From Cuthbertson's, Survey of Tanfield Lea estate, property of Gilbert Spearman, 1715.NEIMME Archive

By 1750, the Great Northern Coalfield was producing over a third of all the coal mined in the UK.

Thomas Bewick's etching of a Northern Coalfield mine in the late 1780s



Cartouche from the NEIMME Archives' copy of John Gibson's Plan of the collieries on the Tyne and Wear also Blyth, Bedlington and Hartley… 1787.

4] The 19th Century. Deep mining and the railways.

At the beginning of the 19th century production of coal stood at 4.5 million tons p.a. with a regional workforce of 12,000. Mr. Craiggy's Academy at Crawcrook (established by the farming families to complement the experience their sons gained working underground from as young as 12 years old by training them in mathematics, geology, map making and geography for the by-now far more economically important mining industry). The Academy's graduates were then apprenticed to established figures and went on to become a young 'disruptor' cohort of innovators, entrepreneurs and engineers.

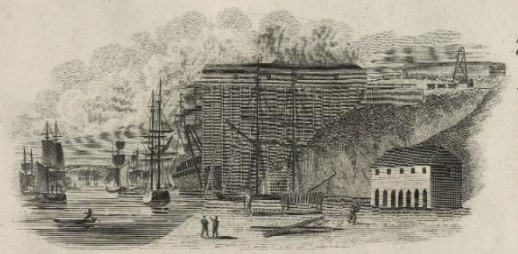
By December 1820, this group of young men – led by Nicholas Wood - had combined with George and Robert Stephenson to integrate the new technology of steam railways (5 years before the Stockton to Darlington line) with the mines. They challenged the dominant orthodoxy and raised the funds to begin sinking the first deep pit in the world through the limestone to the deeper and richer seams below. Their chosen location at Hetton-le-Hole also opened up the River Wear as an alternative to export on the Tyne (and the taxes charged there).

It was a massively expensive endeavour, but it was also to be a massively profitable one and, on the completion of the sinking two years later in 1820, they made sure the region knew about it (celebratory poster of 1822 on next page from the NEIMME Archive). By the 1830s (below) it is clear that the era of heavy industry has arrived and in 1852, Charles Palmer launched his first steam collier, completing coal's new national and international transport infrastructure.

From J.D. Harding's Engraving of Hetton Colliery in the 1830s in the NEIMME Archive

Hetton Colliery IN THE County OF Durham.

PERSPECTIVE VIEW of the WORKS of the COLLIERY, the HORIZONTAL, INCLINED and SELF-ACTING PLANES with the LOCO MOTIVE and other ENGINES used on the RAIL WAY and the STAITHS and SELF DISCHARGING DEPOT on the BANKS of the RIVER WEAR near SUNDERLAND.



The Colliery was begun on the 19th Decr 1820, and for the space of three months, there were pumped from the Pits, by the Main & Machine Engines, 5000 Gallons of Water per Minute, from the depth of 60 yards. The Main Coal Seam was sunk to on 27th Sept.r 1822, Twenty months from the commencement. & THE HUTTON or WALLS END SEAM, on the 6th Jan.y 1825. The former at a depth of 218 yards, and the latter of 296 yards.

The winning of this Colliery forms a new era in the History of Mines & of Geological Science. The opinions of Mineralegists, as well as the majority of the scientific professional Gentlemen, were, that Coal did not exist, or if it did exist, that it deteriorated both in quality & thickness under the magnesian Limestone; but this Colliery has been sunk thro' a Bed of this Stone 38 yards in thickness & so far from being deteriorated, the Coal is superior both in its quality and the thickness of its Seams.

ARTHUR MOWBRAY ESQ.RE PROJECTOR & MANAGER, THOMAS WOOD, ACCOMPTANT, ROBERT STEPHENSON, ENGINEER; to whom the Manager owes many obligations, for fixing and improving the Machinery and for his skill & attention in the sinking, as also to Mr WOOD for his diligence and accuracy, not only as an Accomptant, but for assisting in the levelling & arranging of the Waggonway, for the Self acting Planes &c.

To JOHN HOPPER, ASSISTANT VIEWER,
GEORGE JOWSEY, MASTER SINKER,
RALPH DAY, MASTER MASON;
Wm ELLIOT, MASTER FORGEMAN & SMITH;
Thos NAISBITT, MASTER WRIGHT;
MATTW STAINTON, MASTER FOUNDRYMAN,

and to all the other Men employed in the Colliery for their skill & attention in many difficulties, and for their general good conduct.

5] The North of England Institute of Mining and Mechanical Engineers.

The mining engineers and entrepreneurs of the North East began to make personal fortunes but at the same time, the deeper pits made disasters more common and caused greater injury and loss of life and production. Public anger at the mine owners was growing.

In 1852 after a disaster at the pit in Seaham, a group of engineers – led again by Nicholas Wood as its first President - founded the North of England Institute of Mining Engineers to promote safety underground. The objects of the Institute were twofold:

First – By a union of concentration of professional experience to endeavour if possible, to devise measures which may avert or alleviate those dreadful calamities, which have so frequently produced such destruction to life and property, and which are always attended with such misery and distress to the mining population of the district.

Second – To establish a Literary Institution, more particularly applicable to the theory, art, and practice of Mining than the Institutions in the locality present, or which are within the reach of the profession in this locality.

Nicholas Wood died in 1865 and the Wood Memorial Hall within the Mining Institute's new HQ – opened in 1872 – is dedicated to his memory. It was here – and later in its own lecture theatre (1902) that papers on all aspects of mining and related engineering subjects were presented and then published in the Transactions of the Institute and circulated globally.

"Minds, books, lectures and education became central. Armed with knowledge and know-how and inspired by the desire to get rich, entrepreneurs emerged within an industrial culture wedded to scientific knowledge and technology. Innovative engineers sought to make sense and profit out of the world around them".

Professor Margaret Jacob. The First Knowledge economy

The building design is astonishingly radical – a sudden Victorian Gothic addition in the heart of restrained 'Classical' Newcastle. Both a wholly secular and a profoundly 'regional' building[vi], it also offered a home to what can be seen as the world's first consciously created 'innovation hub'[vii]

In 1879, Mosley Street in Newcastle – on the doorstep of the Mining Institute - was the first in the world to be lit by electric light and in 1880, Joseph Swan made the first domestic installation in the home of Sir William Armstrong at Cragside in Northumberland. In 1884, John Henry Holmes of Shieldfield in Newcastle invented the domestic light switch.

"It is not until we reach Silicon Valley that there is another such concentration of globally important (and massively profitable) innovation in one 'tight' physical location during one short time period"

John Tomaney. Professor of Urban and Regional Planning. UCL

The Mining Institute's design by Archibald Dunn

The NEIMME Lecture Theatre

Images on this page and the next courtesy of The Common Room

The Wood Memorial Library at The Mining Institute

6] The 20th Century. Peak Coal, the steam turbine and coal fired power station.

In 1911 the Mining Institute had 2,300 members and 45% of them worked abroad while, in 1913, production from the home coalfield peaked at 56.4 million tons p.a. with a work force of over 230,000. Although no one would have recognised it at the time, this period, immediately before the Great War, marked the high point of the coalfield.

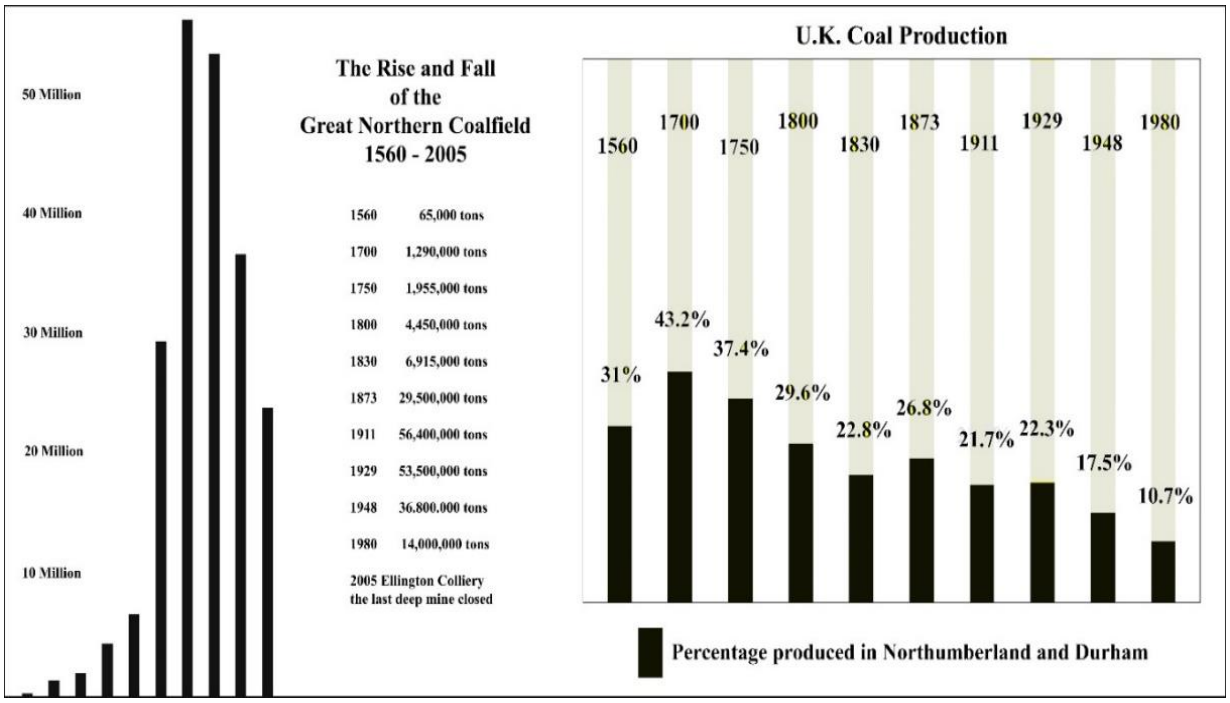


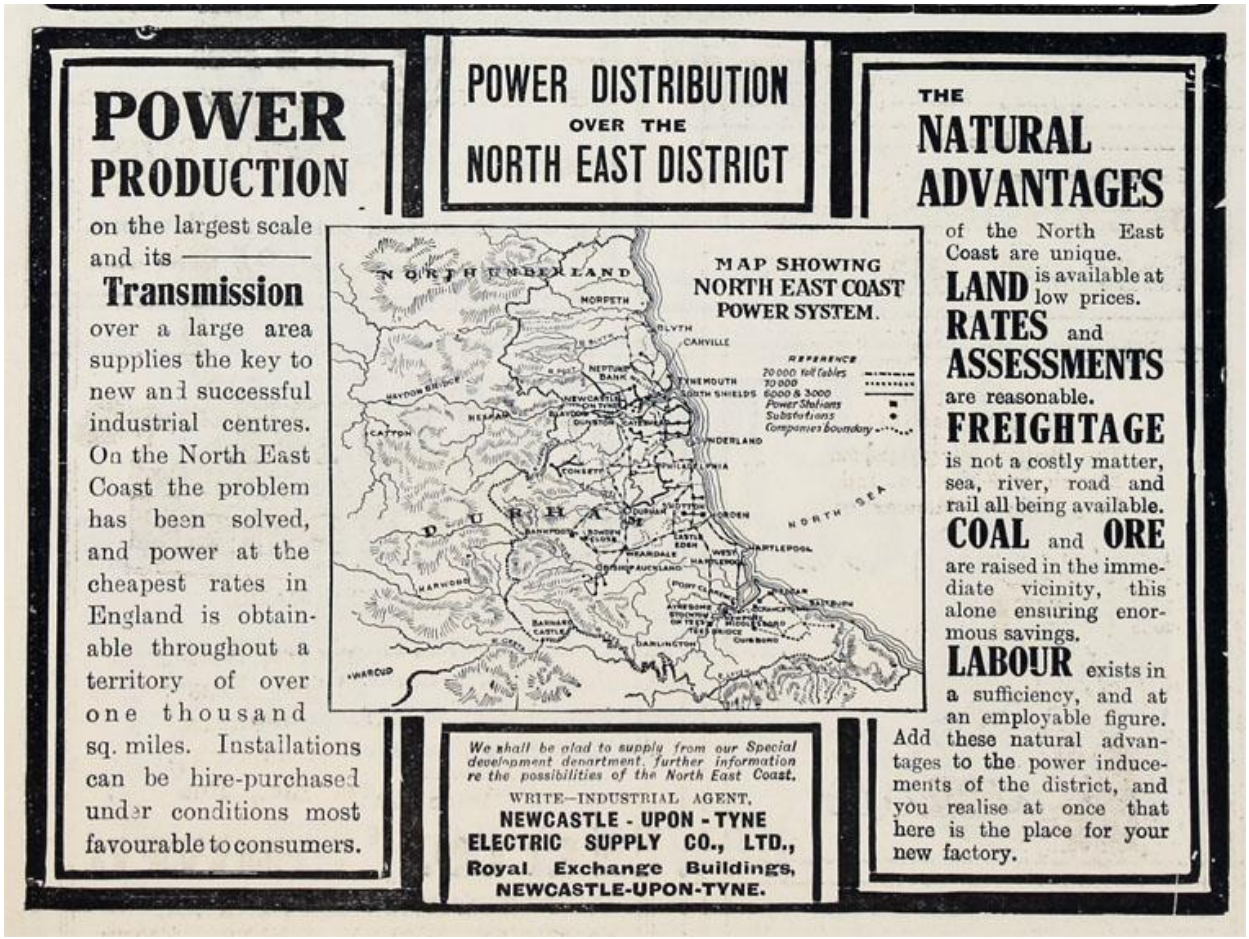
Table constructed by Regional industrial historian, Les Turnbull from a range of sources

By the turn of the century, however, a new generation of the region's engineers had developed another transformative energy technology. Three phase electrical power was delivered to industry for the first time in the world in 1901 (at the Neptune Yard Wallsend). Then, thanks to steam turbines (Charles Parsons), switchgear (Alphonse Reyrolle), boilers and pumps (William Clarke & Abel Chapman) and the prototype of the National Grid (Charles Merz), coal fired power stations and the infrastructure to fuel them and distribute their output were pioneered in the North East.

In 1912, the Newcastle upon Tyne Electric Supply company launched a bid for inward investment (advertisement on the next page) and could boast that:

'The industrial importance of the North East coast is best shown by the fact that, whereas its population is less than 5% of that of the United Kingdom, it yields 20% of the total coal, 35% of the ships, 36% of the coke, 37% of the pig iron and 40% of the ironstone produced in the Kingdom.

Eleven years or so ago when we first seriously turned our attention to the industrial power needs of the district, the total amount of horsepower produced was only 3,000. Today we supply over 200,000 horsepower to all classes of industrial concerns, including railways, tramways, electro-chemical and metallurgical industries, collieries, engineering and iron works of every character'[i]



At the same time, these new technologies were, again, being exported around the world (although horsepower was still occasionally required as in Melbourne in 1919 to deliver a Parson's generator):

Image courtesy of the Parson's collection held by Ruth Baldersera

7] The wider heavy industrial context and the unique role of the Tees Valley.

For the centrality of the Region and its coal to the Industrial Revolution to be fully apparent, the glass, gas, iron, chemical, lead, steel, armaments, fishing, bridge and ship building industries (and more) need to be added. As part of this, the different industrial history of Teesside, though one with no less of an impact on our environment, needs to be acknowledged.

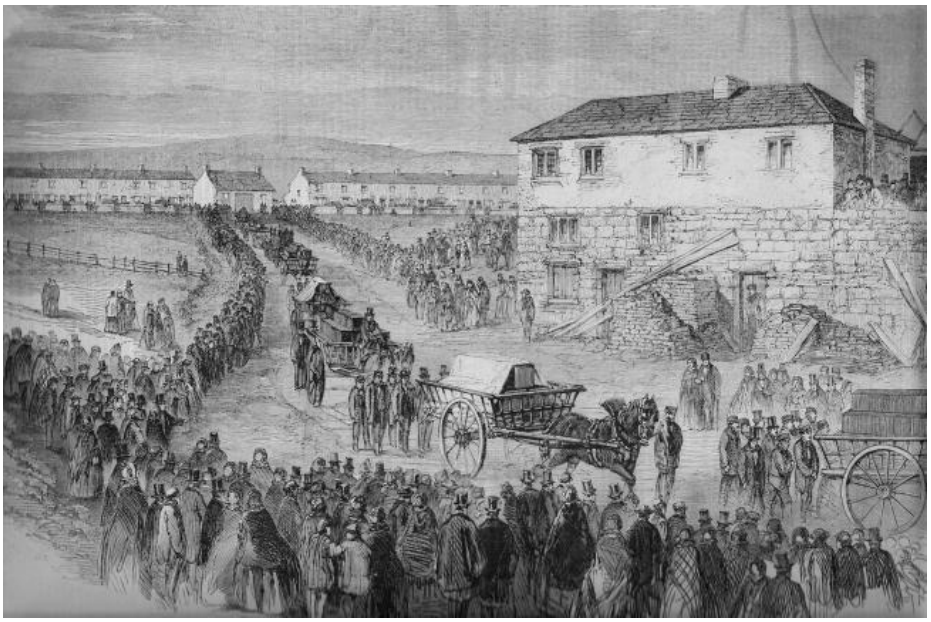
The industrialisation of the Tees Valley begins later than occurred in Northumberland and Durham with the discovery of two other materials that could be extracted in large quantities, Iron Stone (1850) and Rock Salt (1859). The Tees conurbation became the fastest growing area in England during the second half of the 19th century.

From a standing start in 1850 Teesside had 90 blast furnaces by 1876. The Salt fuelled the explosive development of a chemical industry (originally established in 1833 to produce sulphuric acid and fertiliser) and during the first world war production shifted to TNT. Imperial Chemical Industries (ICI) was formed in in 1926 and the chemical expertise of the company facilitated their development of major new products such as artificial fibres and plastics at the new Wilton site. The Tees complex became a major manufacturer of petro-carbons responsible for over 50% of national production. An original base in chemicals, fertilisers and insecticides has been followed by key roles in the development of new products, including Perspex and Dulux paints (1932), Polythene (1937), Nylon (1940), and Terylene (1941) and then pharmaceuticals during the 1950s.

As with coal, so with the chemical industries. Products that ushered in a new era of cheap and affordable food (including Quorn!), clothing and household products as well as new treatments for illness and disease had unforeseen consequences. Here, in the impact on complex ecologies of some of the insecticides and fertilisers and, on our seas, of the non-biodegradable plastics.

8] The effects on NE workers, families, communities and the environment.

The drive and entrepreneurial and engineering genius of these men transformed the world, but the industries also exacted a high price from the workforce, their families, and the communities of the region. It was only in 1830 that Hepburn's strike secured a reduction in the length of shifts for boys (as young as 8) underground from 17 hours to 12 hours, and there are records of over 24,000 deaths in disasters and accidents during the life of the Great Northern Coalfield[viii].



The 4 mile funeral procession for the 204 men & boys after the 1862 New Hartley disaster. Illustrated London News [ix].

Disabling injuries were common underground resulting in destitution for families and industrial diseases and grindingly hard labour (in the home as well as in industry) also caused early incapacity and death. In the 1920s, Dr Henry Mess surveyed the industrial areas of the region and charted the worst levels of TB and life expectancy and the poorest housing conditions in the UK.

As for the population, so for the environment. In the early 18th century Defoe commented upon the smoke from the fires at salt pans at South Shields that he had seen from South of Durham and from Berwick. By the 1840s the South Shields Chartists were protesting against the industrial pollution that was causing their garden crops, lawns and hedges to die. In 1860 there are the first records of trees dying because of acid rain. By the time of J.B. Priestley's English Journeys in 1932 he describes the mining town of Shotton as:

"A clutter of dirty little houses all at the base of what looked like an active volcano, the notorious Shotton Tip, a man-made smoking hill. The atmosphere was thickened with ashes and sulphuric fumes like that of Pompeii, the whole village and everybody in it was buried in this thick reek."

Using the phrase coined this century by Naomi Klein[x], the mining communities of the North East lived in the first 'sacrificial land'.

Shotton Village in the 1930s

Mine waste being dumped into the sea at Blackhall Colliery beach in the 1960s

Images on this page courtesy of Durham County Council

By 1981, it was estimated that 66 million tonnes of colliery waste had been tipped on the 'black beaches' of Durham affecting marine life over four miles out.

9] A response in communitarian values and a radical politics.

These conditions provoked, in turn, exceptional community solidarity with both male and female leadership, a vibrant working-class culture and a radical politics: whether the earliest articulations of Human Rights (Thomas Spence); 'Physical Force Chartism' (Crowley's Crew's support of Harney); Republicanism (Joseph Cowen); Trade Unionism (Thomas Hepburn and William Crawford) or Internationalism (Nobel Laureate Arthur Henderson).

Local women were at the forefront of the national campaign to abolish slavery (the Quakers Elizabeth Pease and Anna Richardson) and the region's formidable (radical and militant) suffragette movement played a major role in the battle for electoral equality (Emily Davison, Mona Taylor, Ethel Williams and women's organisations throughout the coalfield).

During the 20th century the North East became a Labour Party fortress based, in large part, on the strength of organised labour within the major heavy industries. At its peak, the Coalfield had a workforce of over 230,000 directly employed in the mines. Factories such as Lord William Armstrong's mile long Elswick works employed 25,000. Later in the 1960s and 70s, Parson's Heaton works employed 12,000 and ICI on Teesside had 40,000 employees.

Nowhere is the power that flowed to and from the Trade Unions representing these workforces better illustrated than in the 'Pitman's Parliament' at the Redhills, HQ of the Durham Miners, opened in 1915 with each of 298 numbered seats reserved for a colliery delegate[xi].

Images on this page and the next courtesy of Redhills and the Durham Miners' Association

"Redhills is a shining example of what people can collectively achieve. From here, the miners in effect created and ran their own welfare state in the first part of the 20th century. They built hospitals, homes, recreation halls. There was no state to do it for them, so they did it for themselves."

Ross Forbes, Programme Director, Redhills redevelopment.

The political movements in turn took control of local government in the early 20th century – beginning with County Durham under the leadership of Peter Lee[xii] - and were able to further develop policies and implement them in housing, education, health, welfare and economic development well in advance of (and later alongside) national government.

Structural innovation in the region continued before and after the world wars and then nationalisation of the mines and the railways in such areas as industrial estates (Team Valley), council housing (Gateshead) and resettlement to smaller 'County' new towns (such as Peterlee) and regional economic development (NEDC).

In terms of the environment, Durham County Council began its land reclamation programme in 1954. In 1951 there were still 70 collieries in County Durham, but by December 1993 none remained. When the pits closed, they were often left abandoned and derelict, incapable of beneficial use without treatment. Since the land reclamation project was launched, more than 50m tonnes of colliery waste has been removed from inland sites and along the coast[xiii] and more than 2m trees have been planted.

Culturally, the Durham Miners' Gala has survived the loss of its industry base and is now a national celebration of working class cultural, community and political life albeit still rooted in the marching of the bands and the banners of the coalfield to the speeches.

10] The turn of the 21st century and an unjust transition.

Between 1970 and 2000, the North East of England lost (net) nearly 300,000 jobs in industrial production including power and mining at an average of 10,000 a year[xiv] as the North East of England became one of the world's first post-industrial regions. In addition to the loss of jobs there was also the loss of specialist knowledge in the closure of much of the region's R and D capacity[xv].

On the 18th December 2015, a hundred members of the North of England Institute of Mining and Mechanical Engineers gathered in their Lecture Theatre on the 150th anniversary of the death of their first President, Nicholas Wood. Dr Bill Lancaster delivered a lecture on Nicholas Wood and his fellow first directors of the Institute.

On that same day, poignantly but serendipitously, the last shift in the last deep pit in the UK came to the surface at Kellingley. After the lecture the members present observed a minute's silence 'for a great industry'. 300 years after the arrival of the Newcomen Engine, 200 years after the plans for the first deep mine and 100 years after 'Peak Coal' from the Great Northern Coalfield, it was over.

Miners on the last shift at Kellingley. Bruce Adams, Daily Mail, ©2015.

The North East was arguably the first into the era of heavy industry, amongst the very first out, and now with hard-won experience of the consequences for society, economy, communities and culture of such a sudden and traumatic loss of jobs. There was underinvestment in new physical infrastructure and human capital – health, education and training. The North East, therefore, began the 21st century on already weak foundations after an unjust transition to an insecure and too often impoverished future for too many.

This was far from the best basis from which to confront the new challenges of further automation of work, departure from the European Union, the need to transform the economy rapidly to one based on low carbon lives and livelihoods and then – in 2020 – a global pandemic[xvi].

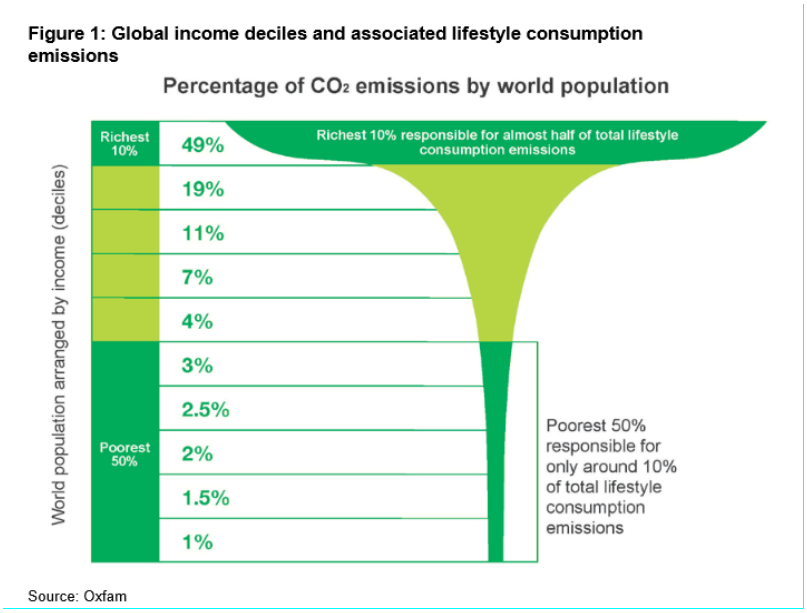
11] Connecting the North East to the causes and effects of the climate crisis.

The story of the centrality of the North East to the 'fuelling' of the global industrial revolution and its climate consequences was little known nationally and – more surprisingly - in the region itself. In the telling here, it evoked mixed but powerful emotions: pride twinned with hubris; sadness with anger; a desire to know more and a heightened sense of place. Then – faced with the scale and weight of the evidence for the seriousness of the global climate crisis – there was a sense of an opportunity (even a duty) for the region to make as exemplary a contribution as possible to the national and international effort to take effective climate action.

Interestingly, if perhaps less surprisingly given the political response to the impacts of heavy industry within the region's story, there was also ready identification with the Oxfam analysis summarised below that shows whose 'lifestyles' are the principal causes of continued growth in emissions and who were most likely to be most negatively impacted by the effects of the crisis.

The largest changes needed to be made by those with the heaviest carbon footprints not those who walk most lightly on the earth. Professor Kevin Anderson of the Tyndall Centre for Climate Change Research points out that, if the richest 10% globally reduced their carbon footprint only to that of the average European, there would be a 30% reduction in overall global emissions.

Figure 1: Global income deciles and associated lifestyle consumption emissions



Source: Oxfam

If we argue for the application of this prioritised approach for action globally and nationally as between constituent nations and regions, then we will also need to be prepared to apply them between and within the region's own communities and localities. There is as profound an ethical dimension to the development of climate action policy as there was in addressing the impacts of mining historically on environment, society, health and economy.

Counter-intuitively, the demands of a green economy, also return us to the critical importance of mining technology given the massive increase in demand for rare minerals such as Lithium and Cobalt and the rarer vanadium, molybdenum and indium alongside the substantially increased demand anticipated for steel and copper (and concrete). [xvii].

12] Finding a framework for an effective regional response during 2020.

It seemed that the climate related challenges that must now be faced – locally, regionally, nationally and internationally – would require the same combination of engineering innovation, entrepreneurial skill and radical ethical approaches to public policy - social, environmental and economic - and politics that informed our particular history and that, in turn, suggested three questions:

- Can power and energy be drawn from our deep history here – as a taproot - to achieve wide public and community support for both the radical targets needed for emissions and energy use reduction and, this time, a 'just transition' to a sustainable, greener future and one that also addressed inherited foundations of inequality, regionally, nationally and globally?
- Over the past decade of austerity, the North East had lost almost all of its regionwide infrastructure. Could the address to the climate crisis be a task that could re-unite the region geographically and across sectors?
- Could the presence of local and combined authorities within any emerging regional structure provide democratic legitimacy for its work in developing regionwide policy and regionwide projects and guarantee an approach based on subsidiarity?

If there was a positive response to these questions, then the North East's unique role in the causes of climate change globally and its early experience of environmental restitution alongside negative societal and economic impacts could enable it to become a natural gathering place for future debates on policy and practice and an active participant in them.

The potential for such international and national positioning of the region suggested the adoption of the international frameworks and timetables of the United Nations and its Intergovernmental Panel on Climate Change (IPCC). Nationally, the same would apply to the timetables and targets of UK Government's Climate Action Implementation Committee and – particularly - to its independent Committee on Climate Change (CCC) and their recent 6th Carbon Budget for 2033-37[xviii].

For 2021 there would be a natural national focus on the build up to COP26 in Glasgow in November 2021 and then in 2022 on the programme of the UK's Presidency of the UN Conference of the Parties. This suggested an early North East regional focus on an event shortly before COP26 at which at least the outline of a substantial North East Prospectus for the critical decade to 2030 and, beyond, to 2050 would be launched.

If the central argument of this paper for the global importance of the region in the causes of the climate crisis is accepted, then that plan might be expected to be truly radical and ambitious, a national leader and one that accepts the need for a just transition globally as well as nationally and within the region.

In the event, consultation led to the broad acceptance of these propositions and by May 2020 an Interim Steering Group was in place charged with the creation of a North East England Climate Coalition (https://www.neecco.org.uk/).

Coda The North East England Climate Coalition.

By the end of 2020 – despite all the pressures of the global pandemic but encouraged by a positive balance of good over bad news for climate and the environment during the year – agreement had coalesced around a future structure and timetable for a collective North East response and a draft Preamble, Vision, Mission and Aims for a new cross sector Coalition was in place.

DRAFT

The North East England Climate Coalition

A cross-sector initiative bringing the region together to tackle climate change, reverse ecological collapse and deliver an urgent and just transition.

Preamble:

It was the engineers and entrepreneurs of the North East of England who developed the technologies that:

- made possible the profitable deep mining of coal from the Great Northern Coalfield
- transported this coal from the pithead to the hearth via the rivers and the seas, using the railways, bridges and steam colliers that they designed and built
- turned steam power into electrical power for industry and the home, via the steam turbine and the coal-fired power station.

These achievements were then exported around the world, producing vast wealth for individuals and for Britain and unimaginable benefits for humanity, but at a heavy price to our families, communities and the environment.

It also "released the genie of coal into the world[iii]" and produced the bulk of the greenhouse gases causing the present climate emergency.

We now stand at a point of crisis that we share with all the other regions and nations of the world; the emergency of climate change – the defining issue of our time.

The climate emergency we all face has been brought into sharper focus by the Covid-19 pandemic, which has abruptly reminded us all that we live in a highly interconnected and interdependent world where collective action is the only solution to a global threat.

While the threat to life on earth posed by climate change is profound, this is also a unique moment of opportunity, post pandemic, to create a better, greener, fairer world for all people – a world transformed.

To achieve this transformation, we will need the same community-based action, radical public politics and policies, scientific knowledge and entrepreneurial and engineering innovation that informed our industrial past.

The creation of the North East England Climate Coalition is our region's contribution, on behalf of future generations, to the urgent, radical and at scale response demanded by the global climate emergency. This response calls for net zero emissions which, if achieved, will mean that the birthplace of climate change – the North East of England - is no longer contributing to the climate emergency.

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Our Vision:

Becoming England's greenest region

Our Mission

To enable the people of the North East of England to confront the climate emergency using the hard lessons drawn from our past, the strengths of our community life in the present, and the hard science that must inform our future, to guide and empower our actions to tackle climate change, reverse ecological collapse and deliver an urgent and just transition.

Our Aims are to:

- convey an overall vision of our Region in the future that everyone - people, communities and organisations in all our diversity - can identify with, including recent arrivals without generational connection to our past. A vision encapsulated in the phrase 'Becoming England's greenest region'.
- deliver climate and environmental initiatives that can only be accomplished regionally and beyond individual sectors.
- give clear added value to our partners regionally and locally, across all of civil society – in the private, public and voluntary sectors. Working with our partners we aim to attract resources and achieve national and international profile that could only be achieved (at scale) by a region-wide initiative such as our Coalition.
- adopt clear and necessarily ambitious targets that can be monitored and evaluated. 'We commit to meet them and we intend to beat them'.
- empower and enable community and sectoral leaders and their communities and organisations to achieve a truly inclusive programme that in particular enables young people to develop their own involvement in addressing the future and assisting their connection to our region's past.

Draft prepared by the North East England Climate Coalition Interim Steering Group including:

Local and Combined Authorities, Local Enterprise Partnerships, The Environment Agency, Nature Partnerships, VONNE, The Integrated Care System for the NE and Cumbria (incl. Hospital Trusts and Clinical Commissioning Groups), Public Health England, Higher Education, Business Representative Organisations, TUC, Schools North East, Youth Focus North East, VONNE Climate Action Alliance.

Endnotes

This paper was prepared as a working document rather than for publication. It is, therefore, deficient in its attributions of quotations, other sources and illustrations. These deficiencies will be rectified if publication is ever planned. Particular thanks are due to the Common Room Librarian, Jennifer Hillyard, for her help. No blame attaches to her.

[i] As examples of the discovered connections between the North East of England and the Eastern Cape of South Africa:

- One of the 1820 Settlers sent out (under false pretences) by the UK government to act as an unpaid buffer force between the Xhosa and the expanding Cape Colony was a Gateshead Sheep Famer, Miles Bowker, whose wife came from Mitford in Northumberland, the home of the Donkin family. Sir Rufane Donkin, was the Acting Governor of the Cape when Bowker arrived in Algoa Bay and he gave his wife's name to Port Elizabeth.
- The first modern coal mine in South Africa was sunk at Molteno in the Eastern Cape in 1896 by John Elliott, a member of the Mining Institute and the nephew of one of the Institute's founders and graduate of Craiggie's Academy, George Elliott. John named the mine, The Penshaw Pit after the mine where George began his working life at 12 years of age.
- Methodists were the major providers of missionary education to the Xhosa and both Clarkebury and Healdtown Schools where Rolihlahla Mandela was given his English education (and name) were largely funded and staffed by the Wesleyans and Primitive Methodists of the Pennines and the Durham Coalfield.

[ii] It is estimated (https://www.gov.uk/government/statistical-data-sets/historical-coal-data-coal-production-availability-and-consumption) that over 15 billion tonnes of coal have been extracted from deep mines in the UK over the last century alone.

[iii] A phrase coined by Barbara Freese and published in her book 'Coal. A Human History'.

[iv] An essay by Regional Historian Bill Lancaster linked to via the front page of the website of 'The Land of Oak and Iron' visitor centre sets out the case. http://www.landofoakandironlocalhistoryportal.org.uk/index.asp.

[v] Text from a paper on the history of the mines in the region included in the NEIMME Transactions

[vi] The shields of the coal ports and towns of the coal field (including those on the Tees) are displayed above the ground floor windows

[vii] The top floor housed the School of Physical Sciences at Durham University (Research), the second floor, the Coal Trades Associations of Northumberland and Durham (Venture Capital and sector specific management) and the ground floor, the Board Room of the Blyth & Tyne Railway (Logistics)

[viii] The Durham Mining Museum records – and is dedicated to the memory of – the more than 24,000 men, women and children who lost their lives in mining related accidents in the North of England since 1293.

[ix] More details of the disaster are at https://www.thenorthernecho.co.uk/history/3183911.beam-eye-pit/

[x] Naomi Klein in 'This Changes Everything' referring to the Alberta Tar Sands and the Appalachian coal fields

[xi] (The Durham Miners' Association are now implementing a major renovation (https://redhillsdurham.org/category/the-pitmans-parliament/).

[xii] Peter Lee began his working life in the pits at the age of ten and – partly because of his size and strength he became a hewer and then – trusted by the men - a leading union organiser and checkweighman. To escape a turbulent private life and earn the exceptional wages available abroad he worked first in the Western USA and then in South Africa where he underwent a damascene conversion and returned home as a teetotaller and leader of both a Primitive Methodist chapel and the first socialist County Council in the world.

[xiii] The 'black beaches' of County Durham have now – forty years after the closing scenes of Get Carter were filmed there – been in the running for UK 'best beach' awards.

[xiv] Data provided by Cambridge Econometrics data, constructed as part of the 'Structural Transformation, Adaptability and City Economic Evolutions'-project (ES/N006135/1) and analysed by Emeritus Professor Alan Townsend of the International Centre for Regional & Development Studies in the University of Durham.

[xv] In addition to the loss of jobs, the 1980s and early 1990s also saw the closure of R&D capacity (e.g. the International Research and Development Company established and owned by Reyrolle Parsons and then Northern Engineering Industries – NEI) that had been internationally important in renewable technologies: solar, wind, wave, tidal, geothermal, combined heat and power and heat pumps since the 1970s

[xvi] https://www.ippr.org/research/publications/a-just-transition

[xvii] Dr. Rick Smith (the immediate Past President) of NEIMME has drawn attention to projections by Guillaume Pitron, in 'The dark side of clean energy and digital technologies' that - if we don't massively increase recycling - "by 2050 we will have to extract more metals from the subsoil than humanity has extracted since its origin. Our 7.5 billion contemporaries will absorb more mineral resources (in 30 years) than the 108 billion humans who have walked the earth to date."

[xviii] https://www.theccc.org.uk/publication/sixth-carbon-budget/