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Monstrous Spectres: Chimneys and Their Smoke in Industrial Britain

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Abstract

What does a chimney mean? As Britain industrialised, chimneys and smoke grew out of technological change and expanding manufacturing. Yet, as I demonstrate here, the substances of brick and particulates had – and have - more than material meaning. This article offers a brief ethnography of industrial chimneys and their smoke in Britain, from the nineteenth century to the smokeless, postindustrial present. Taking as my concern how chimneys and smoke have been ‘written’ into socio-spatial symbolism, I show their polarisation between triumphant spectacle and savage monstrosity. I then reflect on their current, spectral, presence.

Keywords: Industrialism, Britain, space, anthropology and literature

The smoky valley opens ...

Chimney above chimney, hill over hill

A happy hell.

- Ted Hughes, *Remains of Elmet* (1979)

Clogger McGinty has trouble catching his breath. The smoke of past inhalations has silted and spent his lungs. He coughs phlegm and wheezes while walking. Stairs and carparks feel mountainous, and chest infections recur. An inhaler helps on the bad days; on the worst days, Clogger keeps to his bed. He never feels good, but at best ‘Fair to middling’.

Despite – or perhaps due to – his debilitation, Clogger likes to remind people that he is ‘not dead yet’. In the Northern English former textile-town where he lives, a birthday is described as ‘making up’ an age, less the gentle turn of another year than a small personal triumph. Clogger has made up eighty-four, and in a South Pennine place with few octogenarian men, his wife Lottie counts herself ‘Lucky to still have him’. He is not dead yet, but he is certain of what his cause of death will be.

Clogger has been diagnosed with Chronic Obstructive Pulmonary Disease (COPD). Frequenting UK death statistics, this cluster of incurable respiratory conditions includes emphysema and chronic bronchitis (Department of Health 2014). COPD is correlated with tobacco smoking; like many working class men of his generation, Clogger was a regular smoker (though he has since quit). But COPD is also associated with industrial pollution, and Clogger was raised in an environment where ‘chest trouble’ was unremarkable.

Northern England’s manufacturing towns became near synonymous with their *particular* atmospheres during nineteenth century industrialisation (e.g. Mosley 2008). Smoke billowed, soot clung, and factory chimneys towered like spires. Respiratory mortality rates concomitantly rose, yet as Stephen Mosley (2008, 58) notes, ‘the protracted and mundane nature of respiratory conditions, with victims often taking many years to die, helped to obscure their importance as major killers’. There was no national smoke abatement legislation until the Clean Air Act of 1956 – some thirty years into Clogger’s breathing life in an industrial town. Knowing him as one of the last of the textile working generations, in a postindustrial landscape where stopped chimneys now stand as memorials, I want in this article to take his wheezing breath as an ethnographic departure into a smokier past.

Scholars of Britain’s smoky histories (for example Brimblecombe 1987, Corton 2015, Mosley 2008, Thorsheim 2006) describe how industrial atmospheres were not only seen and breathed, but wrought into socio-spatial meaning. Smoke was laden. Such accounts of the past are typically capped by smoke abatement as an environmental and epidemiological turn into an emissions-conscious present. Yet in Northern England, industry itself – not just industrial smoke – has abated; a loss which, as I have explored elsewhere (Goodwin-Hawkins 2014), is locally recalled with ambivalence. My approach in this article, therefore, is to examine both industrial smoke and the chimneys that produced it and which now so conspicuously remain.

Chimneys as monumental substance and visible spectacle mark the first section below, where I draw from archival sources including a nineteenth century engineering treatise and newspapers of the day. I then explore the symbolism of smoke, which at once signalled new kinds of industrial spaces and, to some, suggested their ‘savagery’. Here, I delve into Victorian novels, borrowing from Raymond Williams (1973) and inspired by Nigel Rapport’s (1997, 9) vision for a literary anthropology ‘which deliberately maintains a conversation with whatever ideas and texts appear provocatively to elucidate the subject under review’. Finally, I turn to the spectral (Armstrong 2010), to a postindustrial present where chimneys stand without smoke, brick is still stained black, and Clogger has trouble catching his breath.

Substance and spectacle

In 1781, James Watt took out a patent on

[[Certain new methods of applying the vibrating or reciprocating motion of steam or fire engines, to produce a continued rotative or circular motion round an axis or centre, and thereby to give motion to the wheels of mills or other machines. (Robinson & Musson 1969, 89)]]

Watt’s invention was not the steam engine itself – they had been tinkered with for much of the century – but his ‘new methods’ were a technological improvement, and happened at much the same time as experiments with the first power looms. Mechanised weaving was capital intensive, but produced more cloth, quicker, and more profitably, than weaving on the handloom. Driven by both entrepreneurial lure and market competitiveness, the ‘manufactory’ boom pushed artisanal weaving to the margins (Thompson 2013 [1963]). While the steam engine and the power loom were the two archetypal industrial technologies, they were not, however, an instant pairing; coal, which fired the engines, cost more, especially when water sources could be readily commandeered. In the 1790s, Watt complained, ‘I hear that there are so many mills resting on powerful streams in the North of England that the [steam engine] trade must soon be over-done’ (in Briggs 1982, 57). Yet the steam engine prevailed, likely

because liberating mills from riverbanks allowed for their siting in urban areas, conveniently close to an abundant exploitable labour supply (Malm 2013).

If looms needed labour, and labour needed towns, then engines needed chimneys to funnel away their emissions. Any chimney functions simply through what is known as the ‘stack effect’: a combination of temperature and air pressure that creates suction, drawing smoke upwards (Lindeburg 2010). The taller the chimney, the greater the stack effect. By 1830, industry had overtaken home hearths as Britain’s biggest coal consumer, and by the 1840s, the booming city of Manchester boasted over five hundred industrial chimneys (Mosley 1998). The industrial landscape had arrived.

While industrial chimneys multiplied, the construction of an individual chimney made for slow work. To set solid foundations, excavations might be required. Then, the brickwork would be carefully, cautiously advanced upwards. To allow the mortar to set soundly, a chimney could safely rise by little more than two feet per day and, as the descriptively named *Practical Treatise on Tall Chimney Construction Respecting Upwards of Eighty Chimney Shafts in Brick, Stone, Iron and Concrete* (Bancroft and Bancroft 1885, 10) starkly insisted, ‘on no account should the work be proceeded with in frosty weather’. With the tallest chimneys towering at over four hundred feet, construction could take years – while the substance of brick and mortar could be spectacular.

Spectacular chimneys were the ‘totem poles of the firms that built them’ (Briggs 1982, 74). Chimneys combined function with distinctly visible form; while many were simply utilitarian, others were fashionably designed. For the engineers of the *Practical Treatise*, chimneys might be round, square, or octagonal in shape; for the design-minded, Classical, Gothic and even Norman architectural styles could be ‘ransacked to provide fitting adornments’ (Briggs 1982, 74) for industrial chimneys – with even a notable enthusiasm for ornately decorative Italianate styles breaking out during the 1860s-70s (Pearson 2016).

Completed in 1859 after three years of construction, Townsend’s Chimney in Glasgow (serving not a textile mill but a chemical factory) required nearly one and a half million bricks (Bancroft and Bancroft 1885). At over 460 feet, the chimney was proudly claimed in a contemporary newspaper as ‘higher than the great pyramid’ at Giza (Bristol Mercury 18 May

1861), and would reign for decades as the world's tallest chimney. This spectacular chimney's completion was celebrated by an invitation to visitors, whereby '[d]espite the prevailing crinoline fashion, women made the ascent in order to enjoy the view ... [and] had to tie their skirts to their ankles during the descent' (Adelaide Chronicle April 14 1928). The chimney not only provided a view from a startling height, but soon knit into Glasgow's 'vista'; the view 'from Queen's Park down the main South Side thoroughfare ... terminat[ing] with Townsend's tall chimney in the misty distance' could be applauded as an 'excellent prospect' (Evening Telegraph 13 July 1900).

The spectacle of industrial chimneys was not only of their glories, however. In 1873, the 220-foot Gostling & Co. chimney near Gravesend collapsed just as a small crowd had gathered to watch the laying of the last brick (Bancroft and Bancroft 1885). Six people died, eight were injured; the Royal Engineers were later called in to dynamite the stump. Another example from the *Practical Treatise* is less tragic than surreal. At Smith's Works in 1872, a lone construction worker was 100 feet up a chimney-in-progress when he somehow lost the rope that would let him safely down again. Stranded, he effected his own ingenious rescue by unravelling the wool of his sock, which he let down to anxious onlookers who first affixed a stronger cord, and then a rope, for him to haul back up. Twenty years earlier a woman scaling a Leicester chimney – prompted either, the news report suggests, 'by the curiosity of her sex, or impelled by a desire to see the world' (Southampton Herald 1 July 1854) – was not so lucky. She lost her grip on the rope during the descent and fell nearly twenty feet, breaking a leg, amongst other injuries. Bricks could tumble, bodies could fall; industrial chimneys were complex works of engineering and spectacular sights, yet they could equally prove disastrous.

Signal

Not only brick commanded attention and courted disaster: industrial chimneys billowed smoke that was seen and smelled. Tall chimneys were intended, as the *Practical Treatise* (Bancroft and Bancroft 1885, 9) explains, 'to convey the noxious gases [smoke] to such a height that they shall be so intermingled with the atmosphere as not to be injurious to health'. Topography, of course, often intervened, while the conviction that 'nature' would purify air

polluted was hardly well-founded (Mosley 2008). Smoky atmospheres soon signalled industrial towns.

In her 1854 novel *North and South*, Elizabeth Gaskell describes the arrival of heroine Margaret Hale in a Northern English textile town:

[[For several miles before they reached [the town], they saw a deep lead-coloured cloud hanging over the horizon ... It was all the darker from contrast with the pale grey-blue of the wintry sky ... Nearer to the town, the air had a faint taste and smell of smoke; perhaps, after all, more a loss of fragrance of grass and herbage than any positive taste or smell. Quick they were whirled over long, straight, hopeless streets of regularly-built houses, all small and of brick. Here and there a great oblong many-windowed factory stood up, like a hen among her chickens, puffing out black 'unparliamentary' smoke, and sufficiently accounting for the cloud which Margaret had taken to foretell rain.' (2008 [1854], 69-70)]]

Gaskell called her fictionalised Manchester 'Milton' – literally, mill town. Smoke suffuses Milton. Indeed, smoke signals Milton from several miles away. Milton itself stands as an archetype of many such places where 'the chimneys smoked, [and] the ceaseless roar and mighty beat and dazzling whirl of machinery struggled and strove perpetually' (Gaskell 2008 [1854], 523). Looking upon Bradford in his dystopian tour through *The Condition of the Working Class in England*, a non-fictional industrial transplant, Friedrich Engels (1943 [1844], 40) similarly spied a town 'enveloped in a grey cloud of coal smoke', where 'within reigns ... filth and discomfort'. Near to Manchester, 'The towns themselves are ... reeking of coal smoke, and especially dingy from the originally bright red brick, turned black with time' (Engels 1943 [1844], 43). While his concern was class, not coal, Engels returned more than once to the description 'smoke-begrimed'. Industrial places were new kinds of spaces.

For Gaskell's Margaret, smoke signals Milton as a new space, while notably symbolising her dislocation from an old one. For much of *North and South*, Margaret experiences Milton's smoky unfamiliarity through a nostalgia for her previous home: rural, rose-bedecked Helstone village. The rural indeed served a contemporary cultural role (and often still does) as a fundamental foil to urban, industrial space. Rural places promised 'a natural way of life: of

peace, innocence, and simple virtue' (Williams 1973, 1) in contrast to industrial smoke, speed, and squalor. Hence, as Howard Newby (1987, 3) has observed,

[[‘Nostalgic conceptions of English rural life rarely constitute an accurate assessment of it, for in reality they offer a comment which applies ... to the infinitely more squalid urban industrial present.’]]

In *North and South*, Margaret's error is thus a pointed one: a raincloud is a natural formation; industrial smoke is not.

A similar sentiment was expressed by the real-life Marquess of Lansdowne, whose introduction to the 1853 Smoke Nuisance Abatement (Metropolis) Act told parliament that they were living ‘not under the canopy of heaven, but under one of their own creation’ (Hansard 1853, 1753). Of course, in some parts of Britain, the ‘smoke nuisance’ (for example, Brimblecombe 1998, Mosley 2008) predated industry: London's ‘unwholesome’ atmosphere was complained about in seventeenth century accounts, not least John Evelyn's *Fumifugium* (Corton 2015). Yet, the rapid and unregulated growth of industry made for copious smoke and coagulated new concerns.

Nevertheless, the 1853 Act applied only to London, and ‘unparliamentary’ smoke was prosecuted unevenly, if at all (Thorsheim 2006, Mosley 2008). Part of the reason for this was a distinct lack of public support, especially in the industrial areas themselves (Mosley 2008). While for social novelists and political voices smoke might signal unnatural squalor, for many industrial entrepreneurs and workers smoke instead signalled progress, ‘wealth creation and ‘good times’’ (Mosley 2008, 143). Indeed, especially in the economically fluctuating textile industry, smoke rising from an industrial chimney was a positive sign of fortuitous trade and plentiful work (Mosley 2008). ‘Smoke-begrimed’ industrial towns were thus at once solid and symbolic, in polarised ways: smoke, like Margaret's ‘cloud’, signalled new kinds of spaces, which might be the squalid stuff of contemporary horror, but could equally mean the production of a promising future. In an era when considerable social change was, at least in part, spatially experienced, industrial chimneys and their signalling smoke were more than material.

Savagery

Like Gaskell's Milton, Charles Dickens – already having written London fog into the reading public's consciousness (Corton 2015) - also created an archetypal Northern industrial town in his 1854 novel *Hard Times*. His opening description of 'Coketown' (the name itself suggesting coal smoke), reads:

[[‘It was a town of red brick, or of brick that would have been red if the smoke and ashes had allowed it; but as matters stood, it was a town of unnatural red and black *like the painted face of a savage*. It was a town of machinery and tall chimneys, out of which interminable *serpents of smoke* trailed themselves for ever and ever, and never got uncoiled.’ (Dickens 1854 [2012], 23; my emphasis)]]

Dickens' monstrous (2012 [1854], 66), serpentine descriptions of industrial smoke transpose the strange maps of past explorers onto the new otherness of an industrial town. 'Savage' is surely no mere descriptor, either. The nineteenth century growth of industry paralleled British colonial expansion. Textile production and pink-mapped power twined together: Northern English mills needed the 'empire of cotton' (Beckert 2014) and the wool of colonial sheep stations; by 1831, processing these two resources would account for over a third of the British economy (Beckert 2014, 73).

Anthropologists are familiar with the impacts of political economic entwinements on colonised peoples, and with the discourses of savagery and civilisation that reinforced colonial order. In R.M. Ballantyne's children's classic *The Coral Island* (1858), shipwrecked boys encounter 'ferocious savages' on a Pacific island. Here, the South Seas of colonial fantasy proffer:

[[thousands of beautiful islands ... where summer reigned nearly all the year round, where the trees were laden with a constant harvest of luxuriant fruit, where the climate was almost

perpetually delightful, yet where ... men were wild, bloodthirsty savages (Ballantyne 1858, 13).]]

Savagery lurks amidst exotic beauty. Yet Dickens inverts these narratives; for him, savagery lurks amidst civilisation – the real jungle is brick built. Monstrous smoke and savage brick did not only signal industrial space but, more broadly, symbolised modern horrors, troubling triumph.

While some industrial critics, like Marx and Engels (2010 [1848]), predicted the seizure of production by the working class, others dreamt of a future that *was* the smoke-less past. In William Morris' (1995 [1890], 48) utopian novel *News from Nowhere*, a time traveller from the industrial present encounters an artisanal future:

[[[W]e came by the gates of a big rambling building, in which work of some sort seemed going on. "What building is that?" said I, eagerly; for it was a pleasure amidst all these strange things to see something a little like what I was used to: "it seems to be a factory."

[Dick, the guide, replies] "... we don't call them factories now, but Banded-workshops: that is, places where people collect who want to work together ... In there, for instance, they make pottery and glass – there, you can see the tops of the furnaces ..."

"I see no smoke coming from the furnaces," said I.

"Smoke?" said Dick; "why should you see smoke?"]]

Morris' vision of cooperative work distinguished by an absence of smoke is significant. Smokelessness becomes the atmospheric sign that a renewed civilisation has supplanted industrial savagery.

Spectre

Change *was* to reach the industrial towns, and smoke would dissipate – but neither due to progress nor to fulfil utopian prophecy. As I have noted above, national smoke abatement legislation came into force in 1956, just a few years before Britain began a painful postindustrial transition. The textile industry began to unravel in the 1960s, with other

industries following through the 1970s and 1980s. Notably, David Harvey (2010) also deploys cloud imagery to describe global capital movements, evoking a weather map as a metaphor for shifting, swirling concentrations of capital. On Harvey's (2010) weather map, the clouds of capital now swirled elsewhere: mostly, in the case of textiles, in Asia and the Indian subcontinent where labour cost less (Beckert 2014). Such a geographical shift had, at least in part, been enabled by technological development. As Harvey (2010) has observed, over time capital has become increasingly mobile, and no longer relies on resources affixed to particular places. Just as steam engines had decoupled textile mills from riverbanks, electrified machinery could be plugged in to an increasingly ubiquitous infrastructure. Neither economic nor spatial needs could keep the textile industry in Northern England. Only brick bones would be left behind.

In industrial towns left in industry's wake, huge factories stood purposeless, and many laid off workers left. In the South Pennines, Ted Hughes' (1979, viii) 'smoky valley' became a landscape of mothballed mills, boarded-up shops, and empty terrace houses. The 'happy hell' (1979, viii) became, in the words of another Hughes poem (1979, 38), 'obsolete despair', where 'Black chimneys, lopped stump-low for safety, / Sprout willow-herb.' If an industrial town, like Gaskell's Milton or Dickens' Coketown, could be known by the smoke of its chimneys, a postindustrial town could now be known by *chimneys without smoke*. Once a spectacle, the size of industrial chimneys makes their current disuse all the more obvious. Once a symbol of industrial space, chimneys are now spectres. In the South Pennines, the remaining chimneys still stick out, unpuffing, and sometimes standing eerily amputated, the mill itself long since demolished (a legacy, perhaps, of the attention *The Practical Treatise on Tall Chimney Construction* had given to sturdy foundations). Even when an old mill has been redeveloped – shops or flats being the most common reuses – its chimney remains without practical purpose, standing only as a characterful feature, a 'bit of history' (Edwards 1998). Smoke is spectral, too, now. The absent presence of industrial smoke remains in black-stained stone, and smoke's rumour resides in the eye-catchingly bright facades of old buildings that have had their patina chemically blasted off. Industrial smoke may also endure in bodies, perhaps in the substance blocking Clogger's lungs.

In 2014, local rumours suggested that the disused industrial chimney in the South Pennine village where Clogger and Lottie live was imminently to be pulled down. The former mill the

chimney towered from had long since fallen into disrepair, with a still-habitable section occupied by a mechanic and a carpenter. The chimney itself crumbled forlornly, sprouting a determined tree; according to rumour, the chimney's structural condition had caused concerns about safety. For some, the rumours sparked outrage. A contributor to a local interest internet forum wrote, 'If it was Windsor Castle and was falling down the answer wouldn't be – pull it down. The same should be the case for a feature such as this [chimney], part of a building where so many people laboured for a living years ago, and a well loved local landmark'. This chimney had once stood as a beacon of industrial place, then as a postindustrial spectre, now it had become burnished as a symbol of heritage. Yet not everyone could celebrate this lost past through left behind brick; for some the monuments of past industry were now rubble (Gordillo 2014). When a local mill that Lottie had worked at as a typist was recently demolished, she felt little regret. 'That's a part of my life that's gone now,' she simply said.

Conclusion

For two hundred years, industrial chimneys have meant *more* than their bricks, and industrial smoke more than a cloud or a cough. The smoke was the by-product of technology's 'dazzling whirl', and the chimney an engineering feat. Yet, the chimney was strikingly outsized, the smoke billowed and blackened. An ethnography of industrial chimneys and their smoke, as I have here stitched it, tells of substance and spectacle; of signals of a new kind of space, interpretively polarised between squalor and plenty; of critiques of industry as modern savagery; and, in the post- smoke abatement, post-industry present, of spectres perhaps celebrated, perhaps best forgot.

Once, tall chimneys belched smoke. That smoke was disorienting, and monstrous – industrial smoke still is, elsewhere. While industrial smoke once signalled a new kind of space, promising progress or foreboding savagery, Britain's starkly purposeless chimneys now mark postindustrial places, standing monument in smokeless valleys and in troubled towns that have not been the victors of progress, and have witnessed the savageries of suffering economies and state neglect. In the textile valley, Clogger worked and he smoked and he breathed and he worked. He lived through the industry dying around him, has lived near half his eighty-four years in the smokeless landscape of an industrial district without industry, and he lives still (he is not dead yet!) with bad lungs, and he has trouble catching his breath.

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References

Adelaide Chronicle. April 14 1928. Britain’s tallest chimney. p. 32.

Armstrong, J. 2010. On the possibility of spectral ethnography. *Cultural Studies↔Critical Methodologies* 10 (3): 243–250.

Ballantyne, R.M. 1858. *The coral island: A tale of the Pacific ocean*. London: T. Nelson and Sons.

Bancroft, R.M. & Bancroft, F.J. 1885. *Tall chimney construction: A practical treatise on the construction of tall chimney shafts constructed in brick, stone, iron and concrete*. Manchester: J. Calvert.

Beckert, S. 2014. *Empire of cotton: A new history of global capitalism*. London: Penguin.

Briggs, A. 1982. *The power of steam: An illustrated history of the world's steam age*. London: Michael Joseph.

Brimblecombe, P. 1987. *The big smoke: a history of air pollution in London since medieval times*. London: Methuen.

Bristol Mercury 18 May 1861. Heights of monuments and public buildings. N.p.

Corton, C.L. 2015. *London fog: the biography*. Cambridge, Mass.: The Belknap Press.

Department of Health 2014. Living well for longer: National support for local action to reduce premature avoidable mortality. UK Government: London.

Dickens, C. 2012 [1854]. *Hard times*. New York: Vintage Classics.

Edwards, J. 1998. The need for a 'bit of history': Place and past in English identity. In *Locality and Belonging*, edited by N. Lovell, 147–167. London: Routledge.

Engels, F. 1943 [1844]. *The condition of the working-class in England in 1844*. London: George Allen & Unwin. Trans. F. Kelley Wischnewetzky.

Gaskell, E. 2008 [1854]. *North and south*. London: Vintage.

Glasgow Evening Telegraph. 13 July 1900. Glasgow topics. p. 3.

Goodwin-Hawkins, B. 2014. *Weaving time in the textile valley: Postindustrial temporality in rural Northern England*. Unpublished PhD thesis, The University of Melbourne.

Gordillo, G. R. 2014. *Rubble: The afterlife of destruction*. Durham: Duke University Press.

Hansard 16 August 1853. House of Lords Debates. 129: cc1752–5

Harvey, D. 2010. *The enigma of capital and the crises of capitalism*. Oxford: Oxford University Press.

Lindeburg, M.R. 2010. *Core engineering concepts for students and professionals*. Belmont, California: Professional Publications.

Malm, A. 2013. The origins of fossil capital: From water to steam in the British cotton industry. *Historical Materialism* 21 (1): 15–68.

Marx, K. & Engels, F. 2010. *The communist manifesto*. London: Penguin.

Morris, W. 1995 [1890]. *News from nowhere, or, an epoch of rest: Being some chapters from a utopian romance*. Cambridge: Cambridge University Press.

Mosley, S. 1998. *The chimney of the world: a history of smoke pollution in Victorian and Edwardian Manchester*. Abingdon: Routledge.

NHS 2016. Chronic obstructive pulmonary disease (COPD). Available at: <http://www.nhs.uk/Conditions/Chronic-obstructive-pulmonary-disease/Pages/Introduction.aspx>. Accessed 2/2/17.

Pearson, L. 2016. *Victorian and Edwardian British industrial architecture*. Marlborough: Crowood.

Rapport, N. 1997. *Transcendent individual: Essays toward a literary and liberal anthropology*. London: Routledge.

Robinson, E., & Musson, A.E. 1969. *James Watt and the steam revolution: A documentary history*. New York: A.M. Kelley.

Southampton Herald 1 July 1854. Multiple news items. p. 3.

Thompson, E.P. 2013 [1963]. *The making of the English working class*. London: Penguin.

Thorsheim, P. 2006. *Inventing pollution: Coal, smoke, and culture in Britain since 1800*. Athens, Ohio: Ohio University Press.

Williams, R. 1973. *The country and the city*. London: Chatto and Windus.