

AUSTRALIA'S SMOKE CITY: AIR POLLUTION IN NEWCASTLE

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The City of Newcastle has been viewed as marginal to the main narratives of Australian history, despite its contribution to industrial development being likened in importance to that of a Pittsburgh or Birmingham. A focus on visible air pollution makes it possible to reposition Newcastle as the centre of environmental innovation, largely because of the knowledge gathered by Novocastrians about smoke abatement in the Anglo-American industrial cities upon which it modelled itself. The reduction of smoke in Newcastle since World War II is attributed partially to the City Council activities, but also to the displacement of pollution elsewhere, both within Australia and to the Asian cities to which coal is exported.

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As Australia's first and largest industrial city, Newcastle is intimately linked with visible air pollution. For much of its history, Newcastle's inhabitants accepted smoke-filled skies as signifiers of the city's importance within Australia and its associations with larger and more important cities overseas. More muted voices challenged the necessity of smoke, decrying the tangible difficulties smoke caused. They, too, looked to similarly affected cities and sought inspiration and example from smoke abatement movements overseas. Constrained by the focus of political power in Sydney and by the reluctance of industries to risk their profit margins by undertaking smoke minimisation measures, Newcastle's anti-smoke movement made little headway before World War II. In the post-war period, local, national, and international forces finally converged to enable Newcastle to become the Australian pioneer of effective measures for smoke abatement, through smoke reduction and the displacement of pollution. While these measures improved the

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city's air quality, it was the progressive relocation of sources of smoke which finally cleared Newcastle's skies. Even as Newcastle asserts a new image as a clean and green city, the relationship with smoke continues through the millions of tonnes of coal exported through the port each year. In its post-industrial renaissance, Newcastle has displaced but cannot entirely escape smoke.

LITERATURE REVIEW AND DEFINITIONS

Newcastle has not been well treated in the national historiography. Some academic historians have made important studies of the city, but the majority of work has been conducted within the genre of public histories and studies of specific industries or institutions: in particular hospitals, steelmaking and the coal mining and loading industries.¹ As a medium-sized regional city with a foundation in mineral extraction and heavy industry, Newcastle does not readily fit with the narrative strands which explicate Australian history as having two primary locales, the capital city and the bush, each of which derived its wealth from the produce of the land. This issue has been recognised by historical geographers and sociologists who have analysed Newcastle's recent past as an Australian example of the re-visioning of de-industrialising cities throughout the western world.² From this perspective, Newcastle is no longer an aberration in the Australian urban system but is, with Barcelona, Glasgow, and Sheffield, one of a class of urban areas seeking redevelopment and city re-imaging through instruments such as festival marketplaces.³ This paper uses smoke as a means of exploring how Newcastle and similar cities grappled with the ramifications of their industrial economies in an earlier phase of their histories.

There is a growing body of literature on smoke abatement movements in Great Britain and the US. Following on from the pioneering work of Peter Brimblecombe, Tony Dingle, Martin Melosi, and Joel Tarr, important contributions have been made by David Stradling on the responses to air pollution in the US, and by Peter Thorsheim on the process through which smoke came to be seen as a dirty and unhealthy problem that demanded attention in Britain.⁴ In a joint article, Stradling and Thorsheim compared the efforts to control air pollution in the US and Britain, finding similar definitions of the problem but differences in the timing and approach to it.⁵ Australia trailed Britain in the development of a smoke problem and had little to bring to such discussions. Only limited work has been done on the history of air pollution in Australia, with John Lack's article on

1 Turner, *Manufacturing in Newcastle*; Turner, *Coal Mining in Newcastle*; Docherty, *Newcastle*; Marsden, *Coals to Newcastle*.

2 McGuirk and Rowe, *Defining moments*, p. 52.

3 Stevenson, *Reflections*, p. 107.

4 Brimblecombe, *The Big Smoke*; Dingle, 'The monster nuisance'; Melosi, *Battling pollution*; Tarr, *Search for the Ultimate Sink*.

5 Stradling and Thorsheim, *Smoke of great cities*.

Melbourne's noxious trades an important contribution.⁶ Dan Coward's environmental history of Sydney provides a coherent overview of the slow rise in concern about air pollution in the New South Wales (NSW) capital.⁷

Smoke may be defined as suspended particles of carbonaceous material, grit, and dust resulting from the burning of fuel.⁸ The smoke that spawned abatement movements in Britain, America, and Australia was produced by bituminous coal, also known as soft coal or, in Australia, black coal. This was the primary fuel for industry, transportation, and domestic purposes in each of these countries by the late nineteenth century. The limitation of consideration to visible smoke in this paper is deliberate as it distances the consideration from gases such as ozone, nitrogen oxides, carbon monoxide, sulphur dioxide, and fine particles. These gases are of central concern to current pollution control bodies, but nineteenth and early twentieth century observers were largely unaware of them. Even in the mid-twentieth century, scientists were still unable to measure these gases accurately. Smoke and soot were visible to any observer.

Australian responses to air pollution were shaped by British attitudes, practices, and policies. In the early decades of the Industrial Revolution, commercial smoke was viewed as symbolising productivity, employment, and profit. Over time, some people began to be concerned by smoke and decried the industrialisation that made the nation the 'world's great workhouse, our green fields soiled with soot from steam-engines'.⁹ Similar attitudes arose in the US, a country often considered to have had a greater tolerance for the impact of industry than Great Britain.¹⁰ While those who benefited directly from smoke became adept apologists for it, the rising middle classes in both countries began to speak out and take legal action against local polluters, forming organisations that sought to abate the smoke nuisance.

SMOKE IN NEWCASTLE

The origins of the smoke issue in Australia can be traced to the discovery of coal 160 km north of Sydney in 1797. When a secondary penal establishment was set up to mine the coal in 1804, the early name Coal River was set aside in favour of Newcastle, Britain's great centre of coal mining.¹¹ Australia's Novocastrians embraced their namesake and the whole colony saw the presence of coal as a decided advantage. In 1848 the *Sydney Morning Herald* proclaimed that 'manufactures, commerce, civilization, justice, happiness, and Christianity – home and

6 Lack, Worst Smelbourne.

7 Coward, *Out of Sight*.

8 NSW Smoke Abatement Committee, *Report on Air Pollution*, p. 9.

9 Froude, *Oceana*, pp. 53, 71.

10 Schivelbusch, *The Railway Journey*, p. 94.

11 Governor King to Lord Hobart, 16/04/1804, Historical Records of Australia, I, IV, p. 612.

home enjoyments – are all more or less bound up with the existence and availability of coal'.¹² Newcastle's coal was recognised as an asset to be treasured, well in advance of the similar proclamations that would be made in America about the centrality of coal to a nation's wealth and civilisation.¹³

Newcastle's first coal mines were operated by the government using convict labour, and later as a monopoly granted to the Australian Agricultural Company. By the early 1830s the settlement had a population of only 300–400, with about half of them convict miners and their guards.¹⁴ Several private companies began coal mining from the late 1840s and by 1851 the town population had risen to 1,300.¹⁵ As the coal trade expanded during the 1850s, Newcastle began to expand its dockside, commercial, and industrial activities. With 51,000 inhabitants by 1891, Newcastle was the fifth-largest city and the largest non-capital city in Australia.¹⁶ Industrial development was small in scale – Newcastle had 589 factories in the early twentieth century, 80 per cent of them employing fewer than 10 workers. The few large factories employing between 100 and 300 hands were in the areas of engineering and food production.¹⁷ Nonetheless, in combination with the shipping in the harbour, the railways, the coal mines, gas production, and fires for heating and cooking, even this moderate industrial development was sufficient to darken Newcastle's skies. In 1887, American Consul Thomas Dawson wrote that 'the atmosphere here is constantly filled with coal dust, and it is almost impossible to keep paper clean long enough to write even a short despatch'.¹⁸

Many in the Newcastle community accepted that their fortunes were enmeshed with those of coal mining and industry and set themselves to the task of creating a 'coalopolis' that would be accorded due status and respect.¹⁹ They looked beyond Australia for models for future development and drew comparison between themselves and Chicago, Pittsburgh, Birmingham, and Sheffield. A Chamber of Commerce booklet published in 1908 predicted that Newcastle's destiny was to be the Birmingham or Pittsburgh of Australia.²⁰ In a community conscious of its dependence on the burning of coal, smoke was a visible testament to Newcastle's present and future prosperity.

IDENTIFYING THE SMOKE NUISANCE

Another, more muted comparison was made between Newcastle and the great industrial cities. Some Novocastrians expressed concern that smokiness was doing

12 *Sydney Morning Herald*, 18/01/1848.

13 Stradling, *Smokestacks and Progressives*, pp. 13–4.

14 Linge, *Industrial Awakening*, p. 60.

15 Linge, *Industrial Awakening*, p. 110.

16 Linge, *Industrial Awakening*, p. 15; McCarty, Australian capital cities, p. 119.

17 Docherty, *Second City*, pp. 54, 68.

18 Dawson to A.A. Adey, Despatches from United States Consuls in Newcastle, 31/12/1887.

19 Cushing, *Creating the Coalopolis*.

20 Flynn, *Commercial and Industrial Handbook*, pp. 9, 14–5, 83.

their city harm, as beauty was being sacrificed to profit, to the detriment of Newcastle's citizens and its reputation. The lack of recognition of a smoke problem in Sydney was a major stumbling block for smoke abatement in Newcastle. In 1866 the NSW Parliament passed an Act that followed British smoke abatement legislation, despite some members objecting that the regulations were better suited to 'foggy London' than sunny Sydney.²¹ Although reluctant to acknowledge their smoke, Sydney households and industries were major consumers of Newcastle coal – 64 per cent of the State's factory workers lived in Sydney in 1901, a figure that rose to 79 per cent in 1933.²² Even Sydney Harbour was notable for its smokiness. John Dunmore Lang observed in 1875 that 'a regular blackish cloud from the smoke of Newcastle coal, like that which overshadows most English towns, occupies a considerable portion of the field of vision' from South Head.²³ Smoke is also evident in Charles Condor's *Departure of the Orient – Circular Quay* (1888), and Tom Roberts's *An Autumn Morning, Milson's Point, Sydney* (1888). However, acknowledgement of the problem of air pollution in Sydney was generally lacking. Therefore, effective colonial smoke abatement legislation and the powerful private support for smoke abatement apparent in the United States and Great Britain were not forthcoming.

Novocastrians who were concerned about smoke were left to manage the issue themselves, principally through use of local council powers to address nuisances, and with limited assistance from the *Public Health Act* and the *Smoke Nuisance Abatement Act* of 1902. The Newcastle Borough Council investigated complaints about the 'inconvenience and unpleasantness' of smoke caused by government enterprises including the Honeysuckle Railway Workshop, its own electric light works, railways, trams, and the Asylum for the Insane, and private enterprises including coal mines, blacksmiths's shops, and ice works.²⁴ As was the case with the campaigns against Melbourne's noxious trades, most complainants were members of the middle class who had the leisure, confidence, expectations of a clean environment, and economic independence from polluting industries to become involved.²⁵ Nevertheless, these complaints rarely led to effective measures being taken to improve air quality. The Council did prosecute some offenders, but it was itself the operator of the electric light works and had a vested interest not to impede private businesses in the city.

In Pittsburgh, St Louis and Cincinnati, activist women played a central role as 'municipal housekeepers' in the movement against air pollution.²⁶ There is little evidence of women taking similar action in Newcastle, although smoke had a

21 New South Wales Legislative Assembly, Votes and Proceedings of the Legislative Assembly (1866), p. 483; Coward, *Out of Sight*, p. 194; New South Wales, *Government Gazette*, No. 72, 10/4/1866, Act to abate the nuisance arising from the smoke of furnaces, p. 907.

22 Snooks, Manufacturing, pp. 287–9; Berry, Urbanization and social change, p. 23.

23 Cited by Coward, *Out of Sight*, p. 194.

24 For example, see Newcastle Borough Council, *Minute Book*, 18/09/1893, 14/10/1895, 03/02/1896, 22/02/1904, 04/09/1904; Docherty, *Newcastle*, p. 13.

25 Lack, *Worst Smelbourne*, p. 184.

26 Stradling, *Smokestacks and Progressives*, p. 42.

negative impact on their lives by invading their homes, making it harder to keep dwellings clean and comfortable. A frequent complaint against the smoke was that it soiled washing hung out to dry, undoing hours of hard labour. Houses near the coal mines, railway lines, and the port were poorly ventilated because windows had to be kept closed even in the hottest weather and soot quickly built up on furniture, window sills, and floors. Newcastle's community groups for women were generally limited to charitable associations like the Newcastle Relief Society and the Newcastle and Northumberland Benevolent Society. Smoke-producing enterprises kept working-class men in work and most wives were willing to accept a relatively high level of discomfort as the price of that employment continuing. Metcalfe has argued that the history of Newcastle has often been written as if it were an exclusively masculine place.²⁷ The movement against smoke was another area in which the economic and social structures operating in Newcastle kept women largely out of the public eye and the written record. As in other industrial cities, most Novocastrians accepted air pollution, believing, as the majority did, that smoke symbolised productivity and employment.

HEAVY INDUSTRIALISATION

When the Broken Hill Proprietary Company (BHP) established the first integrated Australian steelworks on Newcastle Harbour, the news was received warmly in the city. Workers welcomed a new, modern employer; the middle classes embraced the status of being Australia's sole steel city. The Council saw it as the realisation of the long-term goal of making Newcastle the nation's chief manufacturing city – 'the Birmingham of Australia'.²⁸ By 1921 the city's population had increased to 84,000, with BHP alone employing 5,500 people.²⁹ Several new companies using steel products were established between 1917 and 1921: Lysaghts galvanising works, Commonwealth Steel, the Austral Nail Company and rod maker Rylands Bros. Other new manufacturing firms based in Newcastle included Australian General Electric and Peter's Ice Cream.³⁰ The State Dockyard was relocated from Sydney to Walsh Island opposite the steelworks in 1914.³¹ Tram and train lines were extended to service the new industrial sites and harbour traffic increased. Manufacturing accounted for around one-third of male employment in Newcastle from 1921 to 1971.³² The direct and indirect impact of the steelworks on Newcastle's air pollution was immense.

BHP's coke ovens and blast furnaces ran continuously, emitting unceasing streams of coal smoke into the atmosphere. 'Smoke pours from the factory and

27 Metcalfe, *Mud and steel*, pp. 1–16.

28 *Newcastle Morning Herald*, 18/06/1912.

29 *Newcastle Morning Herald*, 25/11/1921; Docherty, *Newcastle*, p. 169.

30 Docherty, *Newcastle*, pp. 37–40.

31 Docherty, *Newcastle*, p. 35.

32 Newcastle City Council, *Community Profiles for Suburban Areas*, n.p.; Industries, in *Moore's Australian Almanac*; Docherty, *Newcastle*, p. 24.



Figure 1. Harold Cazneaux's 1925 photograph 'Newcastle Harbour entrance – morning' captures the view that city promoters wanted to deny: the Post Office in the foreground, Customs House in the middle ground and Nobbys in the distance seen through a haze of smoke supplemented by the exhaust from trains at Newcastle Station.

Source: Noel Butlin Archives Centre, Australian National University, N046-114-04 Reproduced courtesy of ANU.

workshop, unchecked, and hangs over the city and suburbs like a pall', an observer wrote (Fig. 1). 'Day and night the Steel Works and subsidiary industries contribute to the great cloud which vitiates the atmosphere and chokes the nostrils'.³³ With industry dominating the local economy, there was limited will amongst governments to impose restrictions on the polluters and apparently little concern over the health or efficiency issues that motivated anti-smoke activists in other cities. Some Novocastrians were troubled, however, by the thought of what others would think of their smoky city. The most common response was to emphasise Newcastle's attractive natural features, including the areas that were zoned as residential districts by their Councils in the 1920s. Thus in 1918, the Chamber of Commerce predicted that Newcastle would be the 'Sheffield of the South', while also maintaining that it had beaches that were the envy of 'visitors from every capital city of Australia'.³⁴ Unlike industrial cities overseas, Newcastle was blessed with a temperate climate, cleansed regularly by sea breezes and fronted with white sandy beaches, all of which helped to minimise the issues of inadequate open space, temperature inversions, fogs, and gloom that beset British and American smoke cities.

³³ Docherty, *Newcastle*, p. 48.

³⁴ Newcastle Chamber of Commerce, *Thirty-second Annual Report*, p. 51.

As in Sydney, the denial of air pollution was a more common strategy than that of interfering with the production of smoke. In 1922, high coal prices, railway rates, and average wages reduced BHP's international competitiveness and the steelworks were closed indefinitely for a major refit. The *Newcastle Sun* described how the 'now smokeless stacks arise from a dead city of steel, and thousands of depressed men eat the bread of idleness'.³⁵ The steelworks reopened in 1923, but insecurity of employment remained a feature of Newcastle through the 1920s and 1930s. With local government in charge of smoke abatement, it is not surprising that little action was taken to force the application of smoke minimisation technologies. The private anti-smoke lobby groups that developed elsewhere were absent. Smoke was part of the Faustian bargain that Novocastrians struck in exchange for employment and membership in a family of industrial cities.

TAKING ON THE POLLUTERS

World War II restored the demand for steel products and Newcastle's factories worked overtime to produce guns, munitions, and ships for the war effort. Any complaints about dirty air carried little weight against a defence of wartime exigency.³⁶ It was only after the war that citizens' associations, retailer groups, trade unions, Communists, and others began to demand more effective action towards smoke abatement. Newcastle Council, concerned over the physical and psychological health of residents, physical damage to buildings, and the perception of Newcastle as a 'smoke begrimed' place to be avoided, established a Smoke Abatement Advisory Panel in 1948, the first such body in Australia. This required no new legislation but was undertaken using powers held under the 1919 *Local Government Act* to control and regulate the emission of smoke, fumes, and dust from chimneys and furnaces.³⁷ The Panel was composed of the Council's Health Committee and representatives of the most active polluters: the Chamber of Manufacturers and Commerce, the railways, the Maritime Services Board, and the Institute of Engineers.³⁸

The Smoke Abatement Advisory Panel was the first body in Australia to apply scientific justifications for the reduction of smoke, which had guided practice overseas since the early twentieth century.³⁹ The Panel recognised that individual submissions – such as that of a Newcastle East woman who brought a bag of soot swept from the floor of her home to the City Hall in 1950 – were too readily dismissed. Instead, it followed the practice of Britain's Committee for the Investigation of Atmospheric Pollution in setting up monitoring stations that recorded

35 *Newcastle Sun*, 20/06/1922 quoted by Docherty, *Second City*, p. 86.

36 Anon., Smoke abatement in Newcastle, p. 86.

37 Moore, *Submissions to Senate Select Committee*.

38 Anon., Smoke abatement in Newcastle, p. 90.

39 Stradling and Thorsheim, *Smoke of great cities*, p. 20.

the level of deposition of insoluble solids.⁴⁰ In 1951, the first year of monitoring at a range of five sites, a fall-out of insoluble solids (largely the unburnt combustible solids and ash in smoke falling back to earth) at a rate of 87.5 tons per square mile per month was recorded. This was a lower level than that of Sheffield with 140 tons per square mile per month and Port Kembla with 100 tons, but more than London at 20.5 tons and Sydney with 20 tons in the City and 40 at Pyrmont.⁴¹

When the Panel investigated the enterprises responsible for Newcastle's air pollution, it was met with a combination of blame-shifting and intransigence. The manager of the BHP steelworks was called before the Health Committee in 1949 and claimed that atmospheric pollution was much lower in Newcastle than in St Louis or Pittsburgh. Although he regarded smoke as a natural by-product of the coal burning process, he also blamed ships and railways for creating much of the smoke that was attributed to BHP.⁴² Government agencies were major polluters. The Zaara Street Power Station built in 1915 east of the Central Business District generated smoke which damaged stock in shops and forced people to work in airless rooms because they could not open the windows.⁴³ The Railway Department claimed that it was already using the most modern machinery available but that the escape of some dust was inevitable. Newbold General Refractories responded to a notice to reduce smoke emissions by arguing that the Council 'is not fully conversant with the importance of the industry to Australia . . . any direction by the council detrimental to production would become more than a local matter, since the only alternative would be to import the bricks from England and America'.⁴⁴

Nevertheless, reductions in the smoke nuisance were achieved incrementally. Managers of polluting enterprises, who were little interested in the aesthetic issues raised by the Smoke Abatement Advisory Panel, came to appreciate the fuel efficiencies that could be gained through smoke abatement measures. Many firms looked abroad for solutions to air quality issues and experimented with ways of reducing smoke, including grit arresters, electrostatic precipitation of fumes, and increasing automation in the feeding of furnaces. Newbolds sent an employee to Britain and Europe to investigate means of reducing smoke emissions and ultimately converted more than half of their kilns to oil firing.⁴⁵ The prosecutions initiated by the Smoke Abatement Advisory Panel and changes made by industries themselves were effective in reducing dust deposit, water-insoluble solids, ozone, and smoke densities. The average fall-out of insoluble solids as recorded by the Council's monitoring stations declined to just 14.4 tons in 1971.⁴⁶

40 Anon., *Smoke abatement in Newcastle*, pp. 90–1; Thorsheim, *Inventing Pollution*, p. 8.

41 Coward, *Out of Sight*, p. 264.

42 *Newcastle Morning Herald*, 14/12/1949.

43 Anon., *Smoke abatement in Newcastle*, p. 88.

44 Anon., *Smoke abatement in Newcastle*, p. 90.

45 *Newcastle Morning Herald*, 04/06/1966.

46 Newcastle City Council Health Division, *Air Pollution Monitoring*, n.p.

Newcastle's pollution reduction initiatives were imitated by other Councils, including Leichhardt and Wollongong, but did not lead directly to state legislation.⁴⁷ As in the colonial period, legislative change followed developments in the UK. The London smog of 1952 killed thousands of people, finally shifting thinking about air pollution from a focus on aesthetics to public health and leading to the UK *Clean Air Act* of 1956.⁴⁸ In 1955, the NSW Parliament had appointed a Smoke Abatement Committee representing government agencies, academia, and industry, including Newcastle's Chief Health Inspector. The Committee investigated the causes and effects of air pollution in NSW and advised that the focus should be broadened from smoke alone to a much wider range of gases, solids, and radioactivity.⁴⁹ While domestic consumption of fuel accounted for 18 per cent of coal burned in Britain, air pollution in NSW was caused primarily by industry and public utilities, with domestic consumption at less than two per cent.⁵⁰ As a result, the movement to improve air quality focussed on high energy-using and heavily polluting industries, transport, and public utilities, rather than domestic users. The NSW *Clean Air Act* was passed in 1961 and administered by the Public Health Department through a new Air Pollution Control Branch with offices in Sydney, Newcastle, and Wollongong.⁵¹ Local councils remained responsible for managing pollution from warehouses, government agencies, boilers, and incinerators, and Newcastle Council expanded its monitoring of air quality to some 45 sites by 1980.⁵² Air pollution reduction was unsteady and slow, but it had begun.

DE-INDUSTRIALISATION

The legislative framework that improved Newcastle's air quality was strengthened when the Whitlam Commonwealth Government became active in pollution control. The NSW legislation was improved in the 1970s by the creation of the State Pollution Control Commission (1987). In Newcastle, smoke proved to be more persistent than many had hoped and remained an issue throughout the 1970s. Residents of inner city Newcastle reported that smoke forced them to hose exterior paint work each day, never leave washing out if the wind was blowing in the wrong direction, and always keep windows on the industry side of their houses closed.⁵³

Air quality in Newcastle improved as the amount of coal burned in Newcastle declined. Although the post-World War II boom benefitted the Newcastle economy – creating near full employment and boosting the city population to

47 Local authorities tackle air pollution problems, p. 11.

48 Stradling and Thorsheim, *Smoke of great cities*, p. 24, n. 8.

49 NSW Smoke Abatement Committee, *Report on Air Pollution*, p. 5.

50 NSW Smoke Abatement Committee, *Report on Air Pollution*, Appendix III, p. 29.

51 Coward, *Out of Sight*, pp. 265–6.

52 Gordon, *Living with Pollution*, p. 28.

53 Gordon, *Living with Pollution*, pp. 45–6.

146,000 by 1971 – few new firms chose to locate in the city. ‘We want industry, industry to employ people’, argued the secretary of the Newcastle Chamber of Commerce in 1973. ‘Industry as we know it means some smoke and dust, and you can’t get away from that’.⁵⁴ But as coal mining was undertaken increasingly away from Newcastle in the Hunter Valley and on the Central Coast, coal users tended to locate away from Newcastle. Power stations were built at Eraring near Lake Macquarie and Bayswater in the Hunter Valley, while aluminium smelters were established at Kurri Kurri and Tomago, both in the Hunter Valley. The State dockyard reduced employment from 2,000 to 460 between 1975 and 1978 and several firms, including Lysaghts, Peters’ Ice Cream, Smith’s Crisps, and Courtaulds, either moved away or shut down in the same decade.⁵⁵ As the BHP steelworks began to reduce its Newcastle operations, the amount of coal consumed fell from 3.0 million tonnes in 1977 to 1.6 million tonnes in 1986.⁵⁶ The official closure of the works came on 30 September 1999. The Broken Hill Proprietary Company had been a main source of air pollution in Newcastle and after it closed the fall-out of insoluble solids declined by 30 per cent in the city’s worst affected suburbs.⁵⁷

Promoters of the city, aided by State governments, positioned themselves to launch a new image for Newcastle. It was portrayed as the city of leisure, the best city in Australia in which to live, the gateway to the Hunter Valley, an arts city with a vibrant contemporary music and performance scene. The new rhetoric was that Newcastle had air that was cleaner than it had been, and cleaner than that of Sydney. Current monitoring shows that Newcastle’s air contains lower levels of pollutants than that of either Wollongong, where steel is still made, or Sydney with its many smaller manufacturing firms and massive load of vehicle emissions.⁵⁸ A reduction in industrial production paired with related improvements in air quality and the availability of redundant inner city and harbourside sites have allowed Newcastle to take on a post-industrial guise. After standing derelict for many years, the Zaara Street power station site was reused for public housing, fronted by green lawns that carpet open space once covered by rail lines serving the wharves. Warehouses have become gymnasia, streets of terrace houses have been renovated, and clusters of cafes overlook an increasingly leisure-oriented harbour.⁵⁹ Newcastle Council adopted the slogan, ‘A clean green city’ in the 1990s and developed policies and programmes to promote environmental sustainability, including an Airshed Management Action Plan (1998) as the centre of a ‘clean and green vision for the city’.⁶⁰ The world’s first greenhouse gas speedometer

54 Docherty, *Newcastle*, p. 160.

55 Docherty, *Newcastle*, p. 44.

56 Marsden, *Coals to Newcastle*, p. 167.

57 Newcastle City Council, *Newcastle Airshed Plan*, p. 1.

58 NSW Department of the Environment and Conservation, *Action for Air Update*, p. 7.

59 Rofo, *Gentrification*, pp. 54–70.

60 Newcastle City Council, *Newcastle Airshed Plan*, p. 2; Newcastle City Council and Cameron Strategies, *Newcastle Airshed Plan, Companion paper*, p. 3.

recording the emission of carbon dioxide from electricity, gas, waste, water, and transport in the city appears on the Council website.⁶¹

COAL EXPORTS: POLLUTION DISPLACEMENT

The clean skies over Newcastle and the new developments they have encouraged disguise the continuing linkage between Newcastle and smoke. The visible evidence is no longer on the western horizon where BHP's smoke pillar once curled, but to the east, where dozens of bulk coal carriers serving Japan, Taiwan, South Korea, and other countries await their turn at the coal loaders. Coal exports have a long history in Newcastle. When coal was discovered, it was its potential as an export to Bengal, Batavia, and the Cape of Good Hope that particularly appealed to the British colonial authorities. Coal exports gave the Port of Newcastle its importance and justified government expenditure on its improvement, enabling ships from all over the world to fill their own bunkers and carry coal to Australian ports and further afield to New Zealand, the US, India, Java, Japan, the Philippines, Hong Kong, and China.⁶² This trade fell off in the early twentieth century, but revived after World War II with exports to Japan. In 1966/67, three million tons of coal was exported through Newcastle; by 1970, the figure had more than doubled.⁶³ By 1984, Australia exported more coal than any other nation, with one-third of this passing through Newcastle.⁶⁴ Continued reliance on cheap imported coal for industrial boilers and electricity generation in its deregulated energy market is one of the factors that have contributed to Japan's increased carbon emissions.⁶⁵ Green groups have drawn attention to the anomalous role filled by the notionally environmentalist city of Newcastle.⁶⁶

Newcastle's achievement of skies free of coal smoke is an instance of what Thorsheim has called pollution displacement. Although the aim was smoke abatement, the production of smoke continued in other places where it affected other environments and other people, 'redistributing the burden of pollution spatially and socially'.⁶⁷ In Newcastle, coal smoke that in the nineteenth century was generated for home heating and cooking began to be displaced in 1866 when the City of Newcastle Gas and Coke Company began to produce gas locally. This continued when the Council opened a small electricity generating station in the city in 1890; this was again displaced to the vicinity of the Zaara Street power station in 1915, and then to the Hunter Valley and Central Coast as power

61 Newcastle City Council website, Climate Cam.

62 Marsden, *Coals to Newcastle*, pp. 17–8.

63 Marsden, *Coals to Newcastle*, p. 118.

64 Owen, Australia's role as an energy exporter, p. 134; Marsden, *Coals to Newcastle*, p. 162.

65 Government of Japan, *Japan's Third National Communication*, p. 94.

66 For example, see Camp for Climate Action Australia, Why take action.

67 Thorsheim, Paradox of smokeless fuels, p. 382.

generation was shifted to the source of the coal.⁶⁸ With electrification of the rail lines, the smoke of the railways has also been displaced to the power-generating stations. The largest and still expanding displacement occurs through the coal exports to Japan, South Korea, and Taiwan. As climate change makes carbon pollution a global rather than a local issue, ongoing coal exports challenge Newcastle's claims to have escaped its smoky past and to be a clean, green, post-industrial city.

CONCLUSION

Smoke and Newcastle are intimately related and this relationship encouraged Novocastrians to look to other industrial cities to find appropriate visions of the city's future. In the twentieth century, as smoke came to be seen as a problem requiring management, comparisons were again made with other smoky cities, either to assert that Newcastle's problem was less pronounced or to seek remedies to the over-production of smoke. Invigorated by these models, from the mid-twentieth century onward, Newcastle led the shift in Australia to a scientific approach to combating air pollution. Local initiatives were assisted by a combination of State regulation and self-interest on the part of the polluters and aided by de-industrialisation, ensuring that smoke was banished from Newcastle's skies. This process can be understood as pollution displacement rather than the abatement that was sought, and the smoke of coals from Newcastle still makes a large contribution to global air pollution. Newcastle's relationship with smoke offers a means of challenging the marginalisation of the city in Australian-focused histories, and of viewing the city instead, as its residents have viewed it historically, as a significant actor in matters of importance to the industrial cities of the Anglo-American world.

REFERENCES

- Anon. (1956) Local Authorities Tackle Air Pollution Problems. *Health Officers' Journal*, 2 (1), 11–15; 19; 31.
- Anon. (2002) Smoke abatement in Newcastle. In: R. Edmonds, ed. *Green Conscience, the Ongoing Struggle for a Clean, Green Newcastle, a History* (Newcastle: Wesley Mission).
- Berry, M. (1984) Urbanization and social change: Australia in the twentieth century. In: S. Encel, and L. Bryson, eds. *Australian Society, Introductory Essays* (Melbourne: Longman Cheshire), pp. 12–64.
- Brimblecombe, P. (1987) *The Big Smoke: A History of Air Pollution in London Since Medieval Times* (London: Methuen).
- Camp for Climate Action Australia (2008) *Why take action against Newcastle coal exports?* [Accessed 31 July 2008.] Available from URL: <http://www.climatecamp.org.au/why-newcastle-exports>
- Coward, D. (1988) *Out of Sight, Sydney's Environmental History, 1851–1981* (Canberra: ANU Press).

68 NSW Smoke Abatement Committee, *Report on Air Pollution*, p. 7.

- Cushing, N. (1995) *Creating the Coalopolis: Perceptions of Newcastle, 1770–1935* (PhD Thesis) (University of Newcastle).
- Dingle, A. E. (1982) 'The monster nuisance of all': landowners, alkali manufacturers, and air pollution, 1828–64. *Economic History Review*, 35, 529–48.
- Docherty, J. (1977) *Second city, social and urban change in Newcastle, N.S.W., 1900–c1929* (PhD thesis) (Australian National University).
- Docherty, J. (1983) *Newcastle, the Making of an Australian City* (Sydney: Hale and Iremonger).
- Flynn, E. E. (1908) *Commercial and Industrial Handbook of Newcastle, N.S.W.*, 2nd edn (Newcastle: Davies and Cannington).
- Froude, J. (1985) *Oceana, the Tempestuous Voyage of J.A. Froude, 1884 and 1885*, G. Blainey, ed. (North Ryde: Methuen Haynes).
- Gordon, M., ed. (1980) *Living with Pollution, Perceptions of the Social Effects of Atmospheric and Noise Pollution in Newcastle's Inner Urban Suburbs* (Newcastle: Datex Cooperative).
- Government of Japan (2002) *Japan's Third National Communication under the United Nations Framework Convention on Climate Change*. [Accessed 29 July 2008] Available from URL: <http://unfccc.int/resource/docs/natc/japnc3.pdf>
- Historical Records of Australia, Series I, Governors' Despatches to and from England* (1924–25) (Sydney: Library Committee of the Commonwealth Parliament).
- Lack, J. (1985) 'Worst smelbourne': Melbourne's noxious trades. In: G. Davison, D. Dunstan, and C. McConville, eds. *Outcasts of Melbourne, Essays in Social History* (Sydney: Allen and Unwin), pp. 172–200.
- Linge, G. J. R. (1979) *Industrial Awakening: A Geography of Australian Manufacturing 1788 to 1890* (Canberra: Australian National University Press).
- McCarty, J. W. (1970) Australian capital cities in the nineteenth century. *Australian Economic History Review*, 10, 107–37.
- McGuirk, P., and Rowe, D. (2001) 'Defining moments' and refining myths in the making of place identity: the Newcastle Knights and the Australian Rugby League Grand Final. *Australian Geographical Studies*, 39, 52–66.
- Marsden, S. (2002) *Coals to Newcastle: A History of Coal Loading at the Port of Newcastle, New South Wales 1797–1997* (Wagga Wagga: Bobby Graham).
- Melosi, M. (1982) Battling pollution in the progressive era. *Landscape*, 26 (3), 35–41.
- Metcalfe, A. (1993) Mud and steel: the imagination of Newcastle. *Labour History*, 64, 1–16.
- Moore, V. A. (1968) *Submissions by V.A. Moore Chief Health Inspector, Newcastle City Council to the Senate Select Committee on Air Pollution at Newcastle on 26th July, 1968* (Newcastle: Newcastle City Council).
- Moore's Australian Almanac and New South Wales Country Directory and Tourist Guide* (1939) (Sydney: J. Moore).
- NARA (1957) *Despatches from United States Consuls in Newcastle, New South Wales, March 26, 1887 to 1906* (Washington: National Archives and Records Service).
- New South Wales, *Government Gazette*, No. 72, 10 April 1866.
- New South Wales, *Public Health Act*, 1902.
- New South Wales Department of the Environment and Conservation (2006) *Action for Air, 2006 Update* (Sydney: NSW Department of the Environment and Conservation).
- New South Wales Legislative Assembly, *Votes and Proceedings*, 1866.
- New South Wales Parliament Smoke Abatement Committee (1958) *Report on Air Pollution in New South Wales* (Sydney: NSW Government Printer).
- New South Wales State Pollution Control Commission (1987) *Environmental Control in New South Wales, a Progress Report* (Sydney: The Commission).
- Newcastle Borough Council (1893–1904) *Minute Books* (Newcastle: Newcastle Borough Council).
- Newcastle Chamber of Commerce (1918) *Thirty-second Annual Report of the Newcastle Chamber of Commerce* (Newcastle: Newcastle Chamber of Commerce).
- Newcastle City Council (1993) *Community Profiles for Suburban Areas: 1991 Census of Population and Housing* (Newcastle: Newcastle City Council).
- Newcastle City Council (2005) *Newcastle Airshed Management Action Plan* (Newcastle: Newcastle City Council).
- Newcastle City Council and Cameron Strategies (1999) *Newcastle Airshed Management Action Plan, Companion Paper for Air Quality Summary Paper* (Newcastle: Newcastle City Council and Cameron Strategies).

- Newcastle City Council Health Division (1972) *Air Pollution Monitoring at Newcastle, 1951–1971* (Newcastle: Newcastle City Council Health Division).
- Newcastle City Council Website (2008) *Climate Cam*. [Accessed 29 July 2008.] Available from URL: http://www.ncc.nsw.gov.au/environment/climate_cam/climatecam
- Newcastle Morning Herald and Miners' Advocate*, 1912, 1921, 1949, 1966.
- Owen, A. D. (1988) Australia's role as an energy exporter. *Energy Policy*, 16 (2), 131–51.
- Rofo, M. W. (2000) Gentrification within Australia's problem city: inner Newcastle as a zone of residential transition. *Australian Geographical Studies*, 38, 54–70.
- Schivelbusch, W. (1980) *The Railway Journey, Trains and Travel in the Nineteenth Century*, A. Hollo, trans. (Oxford: Basil Blackwell).
- Snooks, G. (1987) Manufacturing. In: W. Vamplew, ed. *Australians, Historical Statistics* (Sydney: Fairfax, Syme and Weldon), pp. 286–301.
- Stevenson, D. (1999) Reflections of a 'great port city': the case of Newcastle, Australia. *Environment and Planning D: Society and Space*, 17, 105–19.
- Stradling, D. (1999) *Smokestacks and Progressives: Environmentalists, Engineers and Air Quality in America, 1881–1951* (Baltimore, MD: The Johns Hopkins University Press).
- Stradling, D., and Thorsheim, P. (1999) The smoke of great cities: British and American efforts to control air pollution, 1860–1914. *Environmental History*, 4 (1), 6–31.
- Sydney Morning Herald*, 18 Jan 1848.
- Tarr, J. (1996) *The Search for the Ultimate Sink, Urban Pollution in Historical Perspective* (Akron, OH: University of Akron Press).
- Thorsheim, P. (2002) The paradox of smokeless fuels: gas, coke and the environment in Britain, 1813–1949. *Environment and History*, 8, 381–401.
- Thorsheim, P. (2006) *Inventing Pollution: Coal, Smoke and Culture in Britain since 1800* (Athens, OH: Ohio University Press).
- Turner, J. (1980) *Manufacturing in Newcastle, 1801–1900* (Newcastle: Newcastle Public Library).
- Turner, J. (1982) *Coal Mining in Newcastle, 1801–1900* (Newcastle: Newcastle Public Library).