

The Silent Highwayman: a *Punch* cartoon from 1858 comments on the appalling condition of the river Thames



Turning a tide of filth

We worry about pollution today, but we're lucky, says **RAYMOND SMITH**; the Victorians had to deal with foetid rivers which were little more than open sewers

NO SOONER had the Environment Agency proclaimed last summer that rivers were cleaner than at any time since before the industrial revolution, than the autumn rains left sewage-contaminated flood water swirling around hundreds of households. Still, it could have been worse. In the 19th century, when a Thames pleasure steamboat, the *Princess Alice*, sank, 14 of the 130 survivors died soon afterwards – apparently from sewage poisoning.

Yet this disaster took place two years after the passing of the Rivers Pollution Prevention Act

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of 1876, which reached the statute book just 125 years ago this year. It was also 14 years after £4 million (at 1860s prices) had been invested in a massive new sewerage system for London, to carry the sewage miles downstream to outfalls at Barking and Crossness. Why had so little been achieved?

Swift, in his 1710 poem *A Description of a City Shower*, was by no means the first to comment on the long-standing problem of pollution, when he wrote:

*Sweepings from Butchers Stalls, Dung, Guts,
and Blood,
Drown'd Puppies, stinking Sprats, all drench'd
in Mud,
Dead Cats and Turnip-Tops come tumbling
down the Flood.*

A century later, conditions were becoming progressively more severe. In the north, many rivers were written off as grossly polluted. In the ever-growing metropolis, the Thames may have worsened significantly from the 1820s.

But the most controversial intensification of pollution resulted from attempts to improve public health. The 1842 publication of Edwin Chadwick's *Report on the Sanitary Condition of the Labouring Population of Great Britain* was a response to the appalling living conditions resulting from the industrialisation and population increase, and resulting fears about the tax burden of the Poor Law. It is usually seen as the turning point in the history of public health. Its blunt descriptions are often gut-churning.

A Dr Duncan, who practiced in Liverpool,

described a place where he 'found the whole court inundated with fluid filth, which had oozed through the walls from two adjoining ash-pits or cess-pools, and which had no means of escape in consequence of the court being below the level of the street, and having no drain.' Or as residents of Soho wrote to *The Times* a few years later, in July 1849: 'We live in muck and filthe. We aint got no privez, no dust bins, no drains no water splies, and no drain or suer in the whole place.'

THE PUBLIC HEALTH debate was driven by the miasma theory, which claimed that diseases were spontaneously generated in the stench that hung above putrefying organic matter. Chadwick's novel answer was the universal availability of a continuous water supply to flush water closets into a new self-scouring sewerage system. He was quite explicit in his report that shifting excrement out of living spaces fouled rivers: 'The chief objection to the extension of this system is the pollution of the water of the river into which the sewers are discharged. Admitting the expediency of avoiding the pollution, it is nevertheless proved to be an evil of almost inappreciable magnitude in comparison with the ill health occasioned by the constant retention of several hundred thousand accumulations of pollution in the most densely peopled districts.'

His efforts to introduce water carriage were concentrated on London. Elsewhere, the haphazard application of his system often led to water closets discharging into existing land drainage sewers, spreading pollution to many

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previously clean rivers.

Debates in the press and Parliament, which produced numerous papers, persisted through the following decades and culminated in the 1876 Act. The desire to control pollution was not a sudden outburst of altruism, but an evolving response to changing conditions. Although the two aspects of pollution – industrial and domestic sewage – overlapped, there were different issues involved.

Conditions were acknowledged to be worse in the north. The comments of the Royal Commission on River Pollution's 1871 report on the Aire and Calder may stand for many other rivers. After listing the variety of solid wastes ranging through reject bricks and furnace cinders to the traditional animal carcasses, they wrote of the 'very many millions of gallons per day, of water poisoned, corrupted and clogged, by refuse from mines, chemical works, dyeing, scouring and fulling, worsted and woollen stuffs, skin cleansing and tanning, slaughter-house garbage, and the sewage of towns and houses.' Campaigners against industrial pollution, however, were typically seen as selfish landowners defending not just the quality of their farm land, but also their private parks and fishing rights – at



the risk of destroying the industry on which workers and profits depended.

Although rivers suffered from perennial abuse, there were also 'pollution incidents'. William Harris, author of *A Technological Dictionary of Insurance Chemistry* (1899) was understandably impressed by 'the great fire of Tooley Street, where burning oils, &c., ran over the wharves, and down drains, into the Thames, setting it on fire, and seriously endangering shipping, and adjoining wharves and warehouses.'

In London, the debate was dominated by sewage, and it was this that preoccupied the government, not least because of the 'Great Stink', a pollution episode which brought Parliament practically to a standstill in 1858. Investment in the sewerage systems of London ensued. By the 1870s, they were already overloaded by population growth. Yet another million pounds might have been needed to take the sewage further downstream, where greater dilution might have avoided a tragedy like the *Princess Alice*.

But no-one really knew how to deal with sewage, although many claimed to have the answer. The historian Chris Hamlin has made intense studies of the way that even the defini-

tion of the problem changed over the years. With the realisation that some diseases like cholera and typhoid were waterborne, fears grew that the diseases could be spread by the smells over sewage-contaminated rivers. From the late 1860s, germ-based theories raised concerns about drinking water from such rivers. Against these fears, representatives of the water supply industry argued that rivers were self-purifying (by oxidation). But as one campaigning doctor, Alexander Stewart, said in a tract on *The Medical and Legal Aspects of Sanitary Reform* in 1867, 'The oxidation theory may be true to the extent alleged by Dr Letheby, but its probable *laissez faire* results are not pleasant food for thought, nor, I apprehend, for wholesome fish.'

Chemicals were used to 'disinfect' sewage. These simply delayed the decomposition until the sewage was further downstream, and were known to kill fish. Robert Rawlinson, a leading engineer and a protégé of Chadwick's, told an Institute of Civil Engineers meeting in 1861 that 'the first consideration of a civilised community ought to be human life and health, for it was that, after all, that gave value to property. That object must be effected, even at the risk of private injury to individuals, by partially killing their fish, or partially damaging their ornamental grounds.'

The preferred treatment, however, particularly during the 'high farming' boom of the



River of fire (left): A blaze in Tooley Street in 1861 sent burning oil into the river Thames, adding to the burden of pollution

Sir Joseph William Bazalgette (right) oversees the building of a new sewer in 1862. He constructed London's drainage system and was a pioneer of public health engineering



NOT IN MY BACK YARD

HOW DID 19TH-CENTURY water engineers cope with pollution on their own doorsteps? John Frederic La Trobe-Bateman (right) was an outstanding civil engineer, who thought that 'he had made as many large storage reservoirs as any man living' – actually about twice as many major dams as any rival. Nevertheless, it took him 20 years to prevent the Surrey market town of Farnham from fouling the river Wey above his substantial residence. Gentle encouragement and advice in the late 1860s proved unproductive. By the mid 1870s, the practical achievements of the local council amounted to little more than piping a few of the ditches, and installing some new ones draining into the Wey, and in 1875 buying a new and less smelly cart for the night-soil collectors.



The Rivers Pollution Prevention Act of 1876, which made rather more onerous demands of local authority polluters than industrial ones, opened up new avenues for Bateman to explore. Through the late 1870s, he threatened them with actions under the Act. This provoked the board into commissioning a sewerage scheme – but not to having it constructed. By the end of 1882, Bateman was sufficiently exasperated to seek an injunction, which was granted in mid-1883. A sewerage scheme was authorised during 1884. While Bateman was generally magnanimous in his victory he did successfully object to proposals to build a sewage farm across the road from his Park. The system was finished in 1887 – which left Bateman only two years to enjoy the fruits of his labour before he died in 1889.

1860s, was to re-cycle the nutrients in sewage for agriculture. But this was, as the *Farmer's Magazine* put it in 1871, 'a striking example of the readiness with which a plausible theory may be accepted and promulgated by men of enthusiastic temperament whose minds are given to speculation without the corrective influence of proper experience.' By the mid 1870s, not only had agricultural chemists established just how limited was the manurial value of the sewage, but farming had undergone a catastrophic collapse. Land treatment then simply became the main means of nuisance control.

RIVERS COULD have been more polluted. Despite the popular view of the Victorian period as the era of sewerage, Gilbert Redgrave in a paper as late as 1876 to fellow Civil Engineers, estimated that 'Five-sixths of the population of this country are dependent upon some form or other of middens or cess-pools for the reception of their excreta.' It is ironic that while sanitation had been justified by the need to improve working class living conditions, it was generally the middle classes who benefited most, and were thus the main polluters.

On the other hand, rivers could still be polluted when sewers were not used. Frederick Barry, a


health inspector from the Local Government Board, reported on an 1891 visit to the north. 'The drainage from many houses, and the contents of several privies situated on the bank of the river, are discharged on the foreshore... On this foreshore also ashes, house refuse, waste building material, and midden refuse, had, up to the period of my inspection been deposited in very large quantities... In the intervals between floods, the quantity of excrement, ashes, slops, and other filth deposited on this foreshore, has no doubt amounted at times to several scores of tons. In the whole course of my experience as an inspector, I had not before encountered in comparatively small compass, such a mass of stinking abominations as was in existence at the time of my visit on the Barnard Castle foreshore.' It is no surprise that he was primarily investigating typhoid epidemics down the Tees at Darlington.


By the end of the 1890s, the Rivers Pollution Prevention Act had been acknowledged as a failure. Yet it remained the basis of legislation until 1951. Why? Partly this was because in some northern industrial areas, the decades of political and legal pressure succeeded in overcoming local rivalries and reduced industrial pollution. Local councils were responsible for enforcing the 1876 Act, but many manufacturers had argued that some of these councils were stricter than others in prosecuting polluters, giving an

unfair advantage to businesses in lax districts.

More significant was the development of a relatively cheap and easy technological solution. The new science of microbiology was developing in 19th-century Europe, and the realisation soon dawned on sewage engineers that sewage was being eaten by germs (bacteria) in the soil. They then set about finding the best living conditions for the germs to get on with their work. The result was the modern sewage works. In this, the bulk of the solids are settled out and the remaining water further purified in the familiar circular filters, with their rotating arms. From the 1900s, this techno-fix became the key to controlling pollution and its hazards, and kept the lid on the problem. River quality still fell in the middle years of the 20th century, however, as investment in treatment failed to keep up with population growth and the increasing use of water closets. **H**

JOURNEYS

 *Endangered Lives: Public Health in Victorian Britain* by Antony Wohl (Methuen, 1983); *The British Experience with River Pollution* by L Breeze (New York, 1993); *The Great Stink of London* by Stephen Halliday (Sutton, 2001).

 The International Water History Association www.iwha.net; Crossness Preservation Trust (The Crossness Pumping Station) www.crossness.org.uk.