

# Nuisance Law, Regulation, and the Invention of Prototypical Pollution Abatement Technology

## ‘Voluntarism’ in Common Law and Regulation

Ben Pontin

**Abstract:** The emerging idea that the private enforcement of nuisance injunctions can facilitate investment in pollution abatement technology raises important questions of the wider regulatory context of this area of tort. This chapter examines the role of the Alkali Inspectorate historically in facilitating progressive improvements in industrial production process standards to an extent comparable with nuisance law. It is argued that regulation in this field has demonstrably shaped the development of pollution abatement technology, but exceptionally so. The notion of ‘voluntarism’, which tort scholars have used to explain the scope and limits of nuisance law’s inventiveness, can be helpfully generalized. Voluntarism accounts for the success with which government inspectors set out to clean up industry through pushing the frontiers of clean technology, and the difficulties of sustaining this success with the passage of time. This is illustrated by a case study concerning cement industry pollution.

Keywords: nuisance; regulation; clean technology; voluntarism; Alkali Inspectorate; chemical industry; cement industry

### 1. Introduction

This chapter aims to add some nuance to the emerging argument that nuisance and regulation play complementary roles in the ‘clean up’ of polluting industrial technology (Pontin 2013a, 2013b). The argument as it currently stands is that nuisance law, in its strict liability English form, backed by the remedy of an injunction, facilitates the invention of pollution abatement technology prototypes. These encompass, for example, improvements in the design of chimney flue to mitigate acid gas emissions, or modification of wastewater outfalls to mitigate rivers pollution. Regulatory law then renders the ‘common law prototype’ the ‘industry archetype’, in circumstances where it is considered by the competent regulatory body expedient in the public interest to do so.

One issue that requires elaboration is the nature and the degree of the dependence of regulatory law (and indeed society) on nuisance law’s capacity to facilitate innovation. If it is true that prototypical technologies for mitigating pollution are ‘proved’ in the living laboratory of neighbourhoods in which nuisance remedies are enforced, by private individuals with the means and the will to vindicate private rights, are we then to understand that regulatory law is incapable of facilitating innovation in technology independent of nuisance law? Is regulatory law concerned exclusively with archetype? Drawing on historical material relating to the modern origins of environmental regulation during industrialization, this chapter discusses overlooked areas where regulation has encouraged the invention of pollution abatement technology. However, these areas are exceptional and historically conditioned. The primary reason for the chequered achievement of regulatory law in this setting is the law’s ‘voluntarism’. This is a notion that has its roots in nuisance scholarship (McLaren 1983: 205–219; Pontin 2012: 1031–1035), but it applies also to regulatory law.

Environmental regulation is not commonly understood by scholars of regulation to function creatively in pushing the frontiers of innovation in pollution prevention technology. In specific relation to one form of regulation—the imposition of prescribed production process standards—

many regulation scholars echo Anthony Ogus's early critique of 'specification standards' (Richardson, Ogus, and Burrows 1982). These constitute a 'direct interference with the manufacturer's behaviour', with the following adverse consequence:

[the manufacturer] thus has no incentive to reduce the harmful effects of his processes on the environment and, perhaps even more seriously, to research into new, more efficient, forms of abatement. (Richardson, Ogus, and Burrows 1982: 39)

David Robinson in similar terms critically comments on the 'static nature' of 'traditional' pollution control standards (Robinson 1998: 44–45).

Both Ogus and Robinson draw heavily on the 'British experience' of environmental regulation. They refer to the classic example of a production process standard in the form of 'best practicable means' (BPM). BPM originated as a legal standard in the context of industrial pollution through the Alkali Acts 1874 and 1881, and the Rivers Pollution Prevention Act 1876. It has subsequently found favour throughout the world, for example in North America and Europe, under the slightly different terminology of 'best available techniques' (BAT). Though no one suggests that BPM/BAT is calculated to stifle innovation in clean technology—quite the contrary in principle—that is how critics perceive it to function in reality.

The chapter is structured as follows. Section 2 provides a synthesis of the emerging literature in which it is argued that nuisance law facilitates prototypes in the field of clean technology that create the technological conditions for administrative standardization. Section 3 begins addressing the central issue of the contribution to pollution abatement technology of regulatory law, specifically the BPM criterion. It does so with reference to the regulatory practices of Dr Angus Smith and Dr Alfred Fletcher (the first and second Chief Inspectors of Her Majesty's Alkali Inspectorate, the world's first specialist, national pollution authority). Inspectors enjoyed a wide discretion under the Alkali Acts framework, through the statutorily undefined BPM standard. They chose to embrace the opportunities this provided of encouraging practical innovation in clean technology in the public interest. Section 4 examines the struggle to sustain this proactive, innovation-forcing role. The cement industry is used as a case study to demonstrate corporate and wider governmental resistance both to nuisance law and regulatory possibilities for progressive 'clean-up'. It is proposed that cement and other areas examined support a generalized conception of 'voluntarism', expanding on McLaren's analysis (specifically in terms of nuisance law) of 'countervailing values' that militate against 'resolute action' (McLaren 1983: 205).

## **2. Prototypical Clean Technology within the Framework of Nuisance Law**

The theme of clean technology in relation to nuisance and regulation was largely peripheral to the well-populated debate in 1970s and 1980s about the merits of tort and statutory regulation as competing tools of environmental protection (Michelmann 1971; Epstein 1982). The 'comparative regulatory tools' approach of that period, which was taken to an extreme in the ubiquitous law and economics literature, has come under challenge by tort scholars who focus on the autonomy of nuisance law and the 'non-instrumental' values (of being a good neighbour in an ethical sense) underlying the law (Weinrib 1988; Penner 2000; Beever 2013). That is why it is necessary to emphasize that the concern in this chapter with the social (and specifically technological) consequences of nuisance law for purposes of comparison with regulation is not intended to imply that common law and regulatory law are equally consequentialist in their normative foundations, for they are not. The comparison is between different forms of law with different normative foundations that converge around a common problem arising from polluting industrial processes.

The emergence of the idea of a substantial common law contribution to clean technology has had to overcome formidable scholarly obstacles in the influential studies of Joel Brenner and John McLaren in particular (Brenner 1974; McLaren 1983), whose critiques of nuisance law have dominated the historical literature for decades. These offer generally unfavourable assessments of nuisance law relative to regulatory law during industrialization, including scepticism towards the prospect of nuisance litigation facilitating technological innovation. For example, drawing on Brenner and McLaren, the historian Noga Morag-Levine remarks on ‘a widespread failure on the part of industrial sources to undertake pollution control measures [in Victorian Britain]’ (2011: 11).

The most thought-provoking part of the critique is that nuisance law’s chief weakness relative to regulation was (and is) that it is permissive, or voluntary, in form (McLaren 1983 205–206; Pontin 2012: 1031). This means that it relies on the willingness and ability of individuals with sufficient interest in freedom from pollution in their neighbourhood to spend time and money going to court to protect that interest. Such willingness and ability was clearly wanting in many urban districts in industrial or industrializing Britain, where working-class communities relied for their subsistence on polluting industry. The attraction of regulation, on this thinking, is that it operates outside of the voluntaristic constraints of private litigation. Standing in place of the private proprietor, who may or may not have the means and inclination to protect the property’s environment, is an administrative body with responsibility for implementing ‘strong, uniform measures to protect public health and the environment’ (McLaren 1983: 219).

The revisionist thesis accepts that voluntarism is a real problem for nuisance law operating as an ‘environmental sword’ in many contexts, and it accepts that regulation is in principle advantageous. However, it differs in its emphasis on voluntarism’s positive dimension. In the hands of a public-spirited proprietor with a deep pocket, or a ‘little man’ with the support of a big community, a typical nuisance remedy—an injunction—can have a powerful transformative effect on the technologies or techniques employed by polluting tortfeasors (Pontin 2013a: 191–197; Pontin 2013b: 20). Moreover, this chapter adds different facets to voluntarism by adopting the additional perspective of defendants to nuisance proceedings, and also looking beyond nuisance law to consider voluntarism as central to the scope and limits of environmental regulatory law.

The merit of this generalized application of voluntarism can be illustrated with reference to three main areas of nineteenth-century industrial nuisance litigation studied in the literature. The first area concerns the heavily polluting nineteenth-century copper smelting industry. The unreported case of *David v. Vivian*, which is the subject of separate studies based on local archives by the historians Rees (1993) and Newell (1990), pitted a claimant tenant farmer with strong local support (Thomas David) against a paternalistic defendant industrialist (John Henry Vivian). When the complaint arising from acid gas emissions from his giant Hafod works in South Wales first surfaced (in about 1810), alleging ‘copper smoke’ that was heavily destructive of neighbouring vegetation, Vivian took positive steps to abate the emissions. He contracted scientist-inventors, Michael Faraday and Richard Phillips, to design a flue gas treatment technology that could fix the problem. The fix, which was conceived and modified over about a decade, was not perfect, but it showed potential, and it improved Hafod’s impact on air quality. Some historians account for the victory of the defendant in this case as evidence of a judicial bias in favour of mighty industry (Rees 1993: 42). However, the outcome is also to do with the powerful manufacturer taking seriously the responsibility of being a good neighbour.

Vivian and his son (the heir to the factory dynasty, Henry Hussey Vivian) were friends with Lord Alfred Henry Paget, the co-owner of St Helens Smelting Ltd—the copper smelting firm famously

sued by William Tipping in a claim decided in the claimant's favour by the House of Lords (*Tipping v. St Helens Smelting*). Almost certainly because of considerations of heavy costs (of installation as well as maintenance), but possibly also because the neighbouring estate subsequently acquired by Tipping was derelict, Paget's firm opened for trade in the late 1850s without installing Vivian's prototype for preventing acid gas emissions. When sued, its strategy was to defend its common law right to pollute on various principled bases (Pontin 2013b: 88–89). These were the defence of coming to the nuisance; compliance with the normal industry practices; and the choice of a reasonable location for a works of this kind (on the outskirts of St Helens, a manufacturing district). In other words, the parties to the dispute were in agreement that the operator of industrial works had a moral and legal responsibility to behave in a neighbourly manner, but what exactly that responsibility entailed in principle was for the court to determine.

In these circumstances, because the defendant in Tipping raised issues of neighbourly principle—of what it means to be a good neighbour—it is unclear that the defendant was acting any less differently—less 'responsibly'—than the defendant in Vivian. Besides, when the works relocated deep within the manufacturing centre in response to the enforcement of the injunction awarded to the claimant, Lord Paget's firm took positive steps to clean up their process. They employed a variation of Vivian's nascent clean technology, with ostensibly satisfactory results (Pontin 2013b: 90). This was a voluntary show of responsibility for mitigating neighbourhood pollution comparable to Vivian.

There are many further examples of copper works proprietors choosing to innovate in similar ways, to comply with nuisance law, in the absence of government regulation (Rees 1993: 42–43). The point to stress is that these cases are of interest at a deeper level than defendants' private law 'compliance activity', important though that is. The defendants demonstrated—not only to wider industry and wider residential proprietors but also to the legislature and to the executive—that serious industrial pollution of this kind could be ameliorated through investment in technological modernization. However, they did so in the context of the common law, and thus there is a prior 'lawmaking/declaring activity' to consider. As Raymond Cocks (2004) points out in his short biography of Lord Westbury, the judgment in Tipping is a reflection of a brilliant legal professional at the height of their judicial powers, articulating rules of neighbourly propriety, which hold true today.

A second group of examples that highlights this dual function of nuisance law, in both articulating neighbourly legal norms and proofing technological fixes to neighbourhood pollution concerns alkali works. Knowing of the technical difficulty of manufacturing chemicals in compliance with nuisance law, in 1836, William Gossage patented the 'Gossage Tower'. This was a technique of condensing hydrochloric acid gases within a factory chimney that substantially mitigated the mischief of which neighbours had complained. That and other variations invented to comply with the common law gained the confidence of industry to the extent that, by 1860, many (and perhaps the majority) of works condensed emissions (again without any regulatory law requirement to do so) (Royal Commission on Noxious Vapours 1878).

While the industry was sufficiently profitable to bear the substantial costs of inventing, installing, and operating this clean technology (Pontin 2013a: 191), and indeed to derive some profit from recovered sulphur waste, this was not a case of technological change driven by market forces. Industry faced the 'Hobson's choice' of cleaning up or closing down operations in the neighbourhoods where they were sued. Their choice of the former was a submission to judicial principles of the good neighbour, with instrumental implications in terms of providing a gateway

to statutory regulation in which the ‘common law technology’ was standardized through government inspection.

A third group of historic illustrations of common law clean technology concerns town drainage. Disposal of raw sewage was arguably the defining environmental and public health catastrophe of the nineteenth century, with London’s ‘Great Stink’ replicated on a provincial scale throughout Britain (Wohl 1984). The Brenner/McLaren account depicts the scale of the sewage problem as too great for the common law of nuisance even to begin to resolve (Brenner 1974: 432). However, a dramatically different account has emerged in recent years, stemming initially from Leslie Rosenthal’s contextual study of *Attorney General v. Birmingham Corporation* (Rosenthal 2007). Claimant and defendant archives contain records, which demonstrate that the parties enforced this injunction over a period of 37 years of suspensions and stays of execution, and £500,000 worth of clean infrastructure investment on the part of the local corporation. It only ceased when the claimant was satisfied that the defendant had perfected a means of purification of urban effluent that had polluted the River Tame and the estate that it ran through. Equipped with this sewage treatment technology, the corporation was able discharge up to 40,000,000 gallons of largely purified water daily into the river (Pontin 2013b).

I have elsewhere argued that Adderley’s litigation was the beginning of an orchestrated nationwide common law campaign to clean up sewage effluent discharged to inland waters through technological innovation (Pontin 2013b: 51–57). That is based, in part, on a Local Government Board inquiry, which reported in 1873 (Local Government Board 1873), and which listed over a hundred local authority sewage undertakings that took out loans to pay for experiments into techniques for cleaning up their sewage so as to abate nuisance. Councils were borrowing collectively over £1 million (billions in today’s currency values) to fund experiments with sewage purification involving three broad techniques for sewage treatment: sewage farms, sewage precipitation, and sewage filtration. The considerable engineering intelligence behind these technologies is discussed in detail in Rosenthal’s important book on the impact of nuisance litigation on England’s local sewage authorities (Rosenthal 2014).

Once again, this technological innovation occurred before Parliament regulated rivers pollution under the Rivers Pollution Prevention Act 1876 (albeit that Bills had been debated for some time). And, once again, there is more to this litigation for present purposes than ‘just’ the proofing of a technological fix, sufficient to persuade Parliament that pollution of this and other sorts was avoidable, and legislation apt. The litigation raised sophisticated doctrinal issues. Thus, the ‘great Birmingham Corporation case’ (as it is celebrated by Lord Carnwath (2014: 178)) was ‘great’ in terms not only of its social impact, but also Knight Bruce VC’s crafting of an ingenious equitable approach to the terms of which injunctions would be awarded against polluting utilities that could not be closed down without huge mischief to the nation. It involved the use of suspended injunctions, so as to give the claimant an expectation that they would in reasonable time secure a practical remedy for pollution on the one hand, while allowing the defendant the time and space to invent that remedy on the other. The ‘simple’ principle here is that of neighbourly reciprocity.

The above pattern of common law clean technology has continued in the twentieth and twenty-first centuries. For example, the flue gas desulphurization technology that is increasingly used in one guise or another in fossil fuel power stations (and indeed other large combustion plant emitting acid gases of this kind) was initially piloted by Manchester Corporation Electricity Department in response to Arthur Farnworth’s 1920s nuisance claim (upheld by the House of Lords in *Farnworth v. Manchester Corporation*) (Pontin 2013b: 105). The Corporation chose not to permanently fit this

prototype to its Barton works (preferring the cheaper option of buying off the claimant and building taller chimneys), but its chief engineer—Leonard Pearce—moved to London to take control of Battersea Power Station. He adopted the Manchester technology at this power station in 1930 (Pontin 2013b: 124–125).

More recently, noise nuisance has emerged as major societal concern comparable to sewage and smoke in Victorian and Edwardian times. The common law has once again been at the forefront of technological innovation. In *Halsey v. Esso Petroleum*, the threat of an injunction in respect of noise from the engines of heavy goods vehicles elicited the following response from the defendant's research and development department: a fibreglass engine compartment noise insulation prototype (Pontin 2013b: 150). This technology in one form or another is now archetypical. Likewise, it is understood that noisy buildings have been redesigned in order to comply with nuisance law, such as the extraordinary high-rise Beetham Tower visible from Salford University (the roof of which has been retrospectively fitted with a device aimed at mitigating the whistling of wind—the result of a noise nuisance complaint) (Manchester Evening News 2012).

This evidence is politically delicate, for the invention of clean technology within the framework of private property appears closely to support Hayek's theory of 'spontaneous order' (Ogus 1989), associated with neo-liberal political thought. However, Hayek's libertarian idea of order through the enforcement of common law property rights presupposes that these rights are easily alienable, with trade in them the basis of a pricing mechanism for allocating land use. These examples do not easily fit that paradigm. Elite landed claimants in the nineteenth century were tenants for life of settled land, on trust for their heirs, with limited means to sell that land in an open market. And in the twentieth century, in the cases noted above, the claimants were tenants whose interests in land were also not easily tradeable. Thus, while nuisance law does indeed constitute a form of private ordering, it is not as such, or largely, a market mechanism; sometimes it is the opposite—in the sense of being 'coercive' (Steele 1995).

In challenging the old orthodoxy regarding nuisance law's failures, it is not necessary to exaggerate the importance of tort in this field. It would be incorrect to suggest that nuisance law has ever been, or ever will be, a comprehensive remedy for pollution, or that anyone would wish it to be. Brenner and McLaren are right to highlight large sectors of the population in the past—and to some extent the present—for whom the common law was (or is) institutionally speaking a dead letter. For this and other reasons, Ogus is surely correct in his general assessment of current nuisance law as 'manifestly inadequate as a general instrument of pollution control in an industrial society' (Richardson, Ogus, and Burrows 1982: 30). However, nuisance law has cleaned up polluting technology through unleashing the forces of invention in certain private and public enterprises, generating technological prototypes, and it has done so through a carefully honed application of the basic ethic of reciprocity. On the other hand, Ogus is also too quick to reject a comparable 'dynamism' within command-and-control regulation.

### **3. Prototype and Archetype in Pollution Abatement Technology: Smith and Fletcher's 'Elastic Band Theory'**

This section examines the contribution of environmental regulation to the invention of progressively clean industrial production processes. It identifies a commitment on the part of the nineteenth-century Alkali Inspectorate, operating within the framework of Alkali Acts 1863–1906, to push the frontiers of clean technology, independent of—and in addition to—that achieved by neighbours enforcing nuisance law. The earliest technology-based controls over industrial pollution

are those contained in the Alkali Act 1863 (Vogel 1981). This required alkali works to condense hydrochloric acid gas under supervision of central government inspectors. An amendment to this Act in 1874 introduced a requirement for registered works to employ BPM to prevent pollution of air. This criterion was extended under further legislation in 1881 to the abatement of pollution of water and land. This is the world's earliest example of integrated pollution control (Pontin 2007). These are quintessential 'specification standards', as noted at the outset of this chapter. BPM remained a core standard of UK pollution control until the Environmental Protection Act 1990, which replaced it with the European standard of 'best available techniques not entailing excessive costs' (BATNEEC) (and subsequently plain BAT). The pertinent criticism to which minimum standards of production processes have been widely subject is that they are a disincentive to technological innovation. This was reflected in the 1990s with the popular (in environmental law circles) quip that BATNEEC in practice meant CATNIP (cheapest available technology not incurring prosecution). If that criticism is fair, then in light of the analysis above, it would imply that society is rather reliant on nuisance law for creative improvements to clean technology archetypes.

Ogus and others advance the *prima facie* attractive argument that it would be perverse for a corporation to conduct time-consuming and costly experiments leading to a possible piloting of improved technology that could render the existing archetype obsolete (Richardson, Ogus, and Burrows 1982; Robinson 1998). That argument would have less force were regulated enterprises expressly required, or regulators mandated to, push the frontiers of what is technologically possible, but they are not (at least not explicitly). In the various statutory formulations of BPM–BAT, competent authorities must at most keep abreast of advances in technology. They are under no formal obligation to encourage or even facilitate them. Creativity thus appears to be lacking, at least on the face of the formal regulatory law framework. By contrast, commentators in other disciplines have argued that regulation of this kind can unwittingly inspire innovation. Mostly they have done so on the basis of business self-interest (Desrocher and Haight 2014). Self-interest here has many rationalizations, including the 'first mover advantage', according to which a business can profit by anticipating tightening in technology-based standards (and that it is consequently economically rational to innovate in such circumstances).

The remainder of the chapter centres on the scope for regulatory bodies to interpret their discretion as including a mandate for 'creative inspection', with a similar outcome to the clean technologies invented to comply with nuisance law. The focus is on the practice of the Alkali Inspectorate, throughout its incredibly long history (1864–1987). From the beginning, the Inspectorate interpreted BPM as imposing on the inspector a three-pronged duty:

1. to ensure adoption throughout prescribed industries of standardized abatement technologies and techniques;
2. to research progressively cleaner technologies; and
3. to ensure adoption of proven cleaner technologies.

In particular, the first Chief Inspector, Dr Angus Smith, wrote about the importance of prototype as much as archetype in academic papers, official reports and evidence to public inquiries in the nineteenth century (Royal Commission on Noxious Vapours 1878; Smith 1876a, 1876b). Smith and his fellow inspector Alfred Fletcher (Smith's successor as Chief Inspector) developed a concept of BPM being:

more binding than a definite [environmental quality] figure, even if that could be given, for it is an elastic band, and may be kept always tight as knowledge of the methods of suppressing the evils complained of increases. (Royal Commission on Noxious Vapours 1878; Ashby and Anderson 1981: 40)

Never defined in the Alkali legislation, or litigated before the courts, the meaning of BPM throughout its history was that given to it by the Inspectorate (Frankel 1974: 46; Guruswamy and Tromans 1986: 646). Keith Hawkins's analysis of this kind of discretionary standard setting in a slightly different context (the discharge consent regime under rivers pollution legislation) is apposite: 'not only ... do the agencies possess power to enforce the law, they actually exercise real legislative authority' (1984: 23).

Early inspectors' norms guiding (and indeed emerging from) day-to-day 'executive legislation' are reported in the Chief Inspector's Annual Reports. They are particularly interesting, in how they convey a belief in the dynamism of regulation, pushing the frontiers of clean technology. Ashby and Anderson comment on Fletcher in particular having rejected binding emission limit figures provided for under the Alkali Act 1863 because 'fixed emission limits deter manufacturers from improving their techniques for abating pollution and offer no spur to further research' (Ashby and Anderson 1981: 90). He preferred progressively tighter 'presumptive standards', set by regulators at their discretion, with reference to an expert—and privileged—understanding of ongoing improvements in the state of the art of production process standards. However, Smith arguably had the deepest commitment to the notion of ever-tightening standards of clean technology/techniques.

In an illuminating passage in Smith's evidence before the Royal Commission on Noxious Vapours 1878, the Chief Inspector reflected on a specific scenario where the current regulatory archetype was outdated, and capable of refinement. The following passage reflects the assumption of an inspectorate mandate to take the lead in technological innovation in such circumstances:

[I]t seemed to be that, so long as this imperfect apparatus was in operation, it was quite necessary that the responsibility for the difficulty of the condensation should be borne by the inspector ... If the time comes (and I believe it will come very soon) when a furnace can be made which is not subject to these weekly and almost hourly accidents, then I believe that the responsibility will be taken off the inspector to a large extent, and will be thrown onto the manufacturer. (Royal Commission on Noxious Vapours 1878: Q.152)

On that reasoning, the Inspectorate's role was iterative. It was to prescribe and perfect a clean technology prototype, and to revisit the issue periodically. Industry was on this account a passive recipient of technological innovation for which the Inspectorate was responsible.

While it is evident that Smith saw basic science and technological research as fundamental to the regulatory 'job', and while industry appears to have seen it that way too (Warren 1980), the Treasury took a different view, at least initially. It is clear from Whitehall records that the Inspectorate's paymasters had initially understood inspection to be purely as a matter of policing rules, rather than anything more creative (in terms, say, of researching the scientific basis of a tightening of rules) (McLeod 1965: 99). That was evident in the modest remuneration government inspectors received in the early days. That changed as Smith persuaded the Treasury that the work of inspectors was exceptionally dynamic, involving expert research and development work, alongside policing. Smith received a considerable salary rise. On top of this, he was usually able to secure Treasury funds for laboratory space and equipment to advance test and prove clean technology (McLeod 1965: 99).



This was in addition to the increasingly liberal use that the Inspectorate made of growing numbers of scientists and laboratory facilities employed by industry, which at the very outset of regulation was minimal: ‘When the Alkali Act was introduced, few of the alkali makers had good laboratories, still fewer had chemists’ (Smith 1876: 2). Through his role as Chief Inspector, Smith sought to create a culture of technological innovation within industry. This was built around a regulatory strategy of educating employees in the science of clean technology (now called a ‘compliance strategy’). Thus, Smith likened the role of the inspector to the physician—someone who works with a patient so that their health may prosper. The physician, of course, has a most intimate role, built around expertise and strict confidence—qualities that have always been in tension with wider stakeholder expectation that regulation would be transparent and independent of industry (Frankel 1974; Garwood 2004).

Smith’s reports express satisfaction at the practical fruits of his regulatory model in terms of facilitating technological innovation. Reflecting on the ‘problem’ of the lay character of the chemical industry at the beginning of the era of inspection, Smith commented with pride that ‘now things are entirely changed’ (1876: 3). Smith depicted a hive of innovation within the industry’s newly equipped experimental laboratories, where in-house chemists and government inspectors worked together on cutting edge ideas: ‘the frequent entrance of the Inspector has caused him to be watched, imitated, or criticised, and nothing is commoner than comparison of results with him’ (Smith 1876a: 2). McLeod makes a telling point when he attaches significance to the fact that, on Smith’s death the highest tributes came from the industrialists he regulated, who praised his cooperation, work ethic and the benefits they obtained from his astute scientific mind (1965: 111). The landlords whose ‘lobby’ led to the original Alkali Bill also praised Smith (Royal Commission on Noxious Vapours 1878).

Less is understood, or documented, of Smith’s regulatory practice in the field of rivers pollution. This was different from his Alkali Act remit in that, first, it involved public sector regulated enterprise (local authorities were major polluters of rivers), and, second, it did not place as much emphasis on BPM.<sup>1</sup> Nevertheless, his report to the Local Government Board of 1881 is in the same style as his Alkali Act reports. It begins by asserting a mandate to undertake basic scientific research into the science of river pollution abatement technology (Smith 1881: 5).<sup>2</sup> Over 100 pages are spent summarizing the findings of personal scientific inquiry dating back to 1846. The findings are presented as original and ongoing, and indeed it is the avowed function of the report to provide a benchmark for a further ‘ripening the mind’, providing scientific and technological insight ‘of use on the road of progress’ (Smith 1881: 5). Sewage purification techniques are the main focus of Smith’s pioneering research, with Smith presenting his findings on matters, for example, of ‘aeration’ and ‘mechanical separation’.

The assumed mandate to innovate in these and other ways persisted to the last days of the Inspectorate, albeit with some modification. According to the Royal Commission on Environmental Pollution, the inspectors of the 1970s no longer carried out research themselves, ‘although they occasionally sponsor it’ (Royal Commission on Environmental Pollution 1974: [89]). Crucially, however, they continued to view their mandate as one of having input into research and development undertaken by industry: ‘research is normally carried out by the industry concerned with the Inspectorate making suggestions and generally holding a watching brief’ (Royal Commission on Environmental Pollution 1974: [89]). This reflects the success of the early regulatory policy of nurturing in-house expertise (McLeod 1965: 107–108).

Interestingly, the justification offered for overseeing rather than initiating innovation was the emerging “‘polluter pays” concept’ (Royal Commission on Environmental Pollution 1974: [89]). This is too simplistic. There were other important factors behind a withdrawal from Smith and Fletcher’s early ‘hands-on’ practice, as explored in the next section, within the framework of ‘generalized voluntarism’ applied to an industry of particular importance: cement.

#### **4. Generalized Voluntarism in the Context of the Cement Industry**

Between 1864 and 1900, the number of industrial processes regulated by the Alkali Inspectorate increased tenfold, with roughly a thousand large industrial facilities were under the Inspectorate’s supervision at the turn of the twentieth century. This growth in the number of enterprises within the body’s remit placed strain on Smith and his successor Chief Inspector (Fletcher) and their style of elastic and creative engagement with ever cleaner technology. However, there were other factors, which made it difficult to sustain the early regulatory style. This section identifies these factors with reference to a case study of cement industry regulation.

Unlike the chemical industry, this industry was ‘old’, which meant that it had established ways of doing things, including customary processes that operators were used to pursuing with freedom from inspection. Smith may or may not have known that the industry had proved resistant to the kind of technological fixes conceived in the fields of copper and chemicals, in response to nuisance complaints. Indeed, in an important slant on the problem of voluntarism, nuisance claimants in this field appear not to have been deterred by the costs of litigating, but by intimidation on the part of the industry. Prospective claimants gave evidence before the Royal Commission on Noxious Vapours of cement works of employees bullying them into desisting with their claims through physical threats (Royal Commission on Noxious Vapours 1878: Q 8637).<sup>3</sup> Sometimes (as in an action against Messrs John Bazely White and Co, an enormous cement works with 25 chimneys) the parties ‘agreed’ an ex-post settlement in which the polluted land was acquired by the tortfeasor (Royal Commission on Noxious Vapours 1878: Q 8721)—very different from abating pollution through cleaner technology.

The scene, then, was set for the Inspectorate taking a unique opportunity to blaze a trail of clean technology. Smith approached the task with typical zeal and efficiency, in readily securing government support for bringing the industry within remit of the Inspectorate, under the 1881 Act. Smith sought, and obtained, a power of pure inspection only, rather than a power to inspect with reference to BPM. This was because BPM did not exist. Thus, the purpose of inspection was therefore fundamentally one of innovation. It was to assist in the development of BPM.

However, the Inspectorate greatly struggled to facilitate the next step, or steps, in the cycle of inventing a novel process that could be standardized across industry. Smith was surprised at how backward thinking the cement industry was, when compared to the chemical industry. In one of his final annual reports (published in 1883, the year before his death), he criticized the medieval design of cement works’ furnaces and chimneys, taking the form of ‘short cones with greater apertures vomiting smoke which flows over the ground in heavy streams’ (Smith 1883: 20). The problem was compounded by the thoughtless use of salt water and salty clay in the manufacturing process. This caused the emission of highly noxious hydrochloric acid gas. Smith ‘the fixer’ reported with as much a sense of weariness as pride that ‘I originated a substantial improvement’, by designing a fresh water process (Smith 1883: 20).

Smith’s successor, Fletcher, initially embraced the challenge of the clean-up of cement processes with enthusiasm and acuity. He showed interest in the electrostatic precipitation of gas and dust as

a potential BPM for this industry (and others), which academic physicist Oliver Lodge conducted in respect of a lead works in Chester (in 1886) (Ashby and Anderson 1981: 111; LeCain 2000). However, Fletcher does not appear to have prioritized the realization of this potential, and it was 50 years (and a succession of new chief inspectors) before the Inspectorate was satisfied that this technology was practicable. It became BPM for the cement industry in 1935 (Ashby and Anderson 1981: 101). The Inspectorate suffered in the eyes of the public as a consequence of the delay.

Ashby and Anderson commented in their retrospective on the Inspectorate on how the cement industry became a ‘whipping post ... to which the public like to tie the Inspectorate’ (Ashby and Anderson 1981: 134). The authors offer a sympathetic defence of the Inspectorate, in mentioning that: ‘the inspectors have to strike a balance between the need for cement and the discomfort to people’ (Ashby and Anderson 1981: 134). However, this is generous to Smith and Fletcher’s successors, for they arguably substantially underestimated the extent and the legitimacy of public frustration with cement pollution at this time, and with its regulation.

With a small full-time staff (about ten)—and no administrative system for dealing with public complaints—the Inspectorate often experienced criticism being channelled through the political representatives of Parliamentary constituents struggling to survive in chronically polluted cement works localities. Consider, for example, the letter from two Kent ‘housewives’, read out in the House of Commons by Dartford MP Sydney Irvine:

The cement dust comes over in billowing grey clouds, descends like a fog, coating pavements and cars and smothering gardens and fields. We have heard the same story, not only from housewives, but also from the staff of four local hospitals, shopkeepers, café and public house proprietors, who all complain bitterly about the unceasing struggle to keep food and premises free from cement dust. It creeps into food and crockery cupboards, smothers vegetables, flowers and trees in the gardens, ruins paintwork and soft furnishings, fills gutters and clogs the drains, and spoils the housewives’ family wash. It is accompanied by a vile sulphurous smell, and at night windows have to be kept closed—but still the dust and smell penetrate. (House of Commons Debate 13 June 1962, col 342)

In terms of environmental pollution on a grand scale this reads like testimony of nineteenth-century witnesses of pollution, except that the complainants at this time are not of the landed gentry speaking through land agents, but urban and suburban people speaking through their MP. This was the very ‘public’ that the architects of the Alkali Acts had in mind in enacting public interest controls on polluting industry.

Irvine drew to Parliament’s attention a residents’ petition calling for tougher regulation, with 13,500 signatures. The spokesman (F V Cofield) for the Housing and Local Government Ministry responded by calling for the local petitioners to maintain its trust in the Inspectorate (House of Commons Debates, 13 June 1962, col 344). Thanks to the Alkali Act regime, it was explained, Britain had ‘pioneered’ electrostatic precipitation, as ‘a remarkably efficient device that traps a very high proportion of the dust in the flue gases’ (ibid). The problem in the specific instance of the Kent cement industry at this time was ‘technical’. It was that the works were using clay that had too much salt content for precipitation to work. Solving this problem would take time and require patience.

There are two aspects of the government’s defence to consider here, first, concerning Britain’s pioneering role in clean technology, and second, the ‘technical’ nature of the problem at the heart of public disquiet. Thus, regarding the Alkali Acts being credited with world-leading cement pollution abatement technology, this is only partly true. Fletcher had indeed (as above) witnessed

what appears to have been the world's earliest experimental application of a prototype of this kind in the setting of a commercial industrial process, but he and subsequent chief inspectors were slow to appreciate its practicability, and slower still to secure its imposition as BPM in the face of resistance from the cement industry. This illustrates Frankel's contemporary criticism of industry calling the shots: '[i]ndustry has had little cause to engage in any serious conflict with the Inspectorate, for the system that has evolved serves it well. It can install pollution control equipment virtually at its convenience' (Frankel 1974: 46). The telling phrase here is 'evolved'—it started out very differently, with regulators in charge of the regulated, rather than vice versa.

Regarding the government's references to Kent folk being victims of a 'technical problem' in connection with acid gases, this again is only part of the full picture. The fundamental problem was more political than technical. Politics had not been a substantial factor in Smith's initial regulatory input in relation to cement pollution. He simply deduced from rudimentary chemical arguments regarding the effect on the atmosphere of the combustion of clay with a high salt content that cement works should use low salt clay. As there does not appear to have been any substantial difference in cost of high or low salt raw materials, there could be no possible objection on the part of industry to use of the cleaner raw material being, or becoming, normal practice. However, after decades of growth in the construction industry, low salt clay and fresh water had become increasingly scarce and the price differential between it and the 'dirtier' versions was growing ever greater. This is at the root of the local suffering of Kent residents living in the midst of the industry. Smith's formative question of 'how industry could avoid pollution purely technically speaking?', had through change in historical context become one of 'how could technically feasible clean technology be financed politically?' But the Inspectorate was unwilling to acknowledge this to wider stakeholders, and perhaps even to itself. Instead, it perpetuated a convenient illusion that regulation was—as it was intended to be at its outset—a matter of implementing expertise of a technical nature.

Overall, the cement industry is a thought-provoking case study of limitations, affecting both nuisance law and regulation. Many of the various facets of voluntarism as a problem, or as a constraint, can be seen to be at play here. Regarding nuisance law, businesses intimidated private victims into desisting with threatened actions, and where that failed, they chose to pay to pollute (by acquiring the claimant's land) rather than clean up. Faced with the prospect of unrelenting neighbourhood pollution, wealthy residents moved out and were 'voluntarily' replaced by those with less prospect of cleaning up the industry through private remedies. Later, one can imagine a nuisance claim supported by legal aid being contemplated by one of the many thousands of Kent petitioners, rather like that which enabled Thomas Halsey to clean up his locality in London (*Halsey v. Esso Petroleum*; Pontin 2013b). Instead, the community placed faith in its political representative.

In terms of the Alkali Inspectorate, this approached initial regulation of this difficult industry bullishly, and secured 'low fruit' clean-up where that was available at no additional cost (eg use of low salt clay). However, inspectors were surprised to encounter intransigence when being cleaner entailed substantial financial investment on the part of industry. In addition, as the industry became increasingly central to the post-war economy—vital for clearing slums and rebuilding bomb-damaged towns and cities—they enjoyed the support of many sectors of Whitehall. Inspectors were thus subject to the problem of 'countervailing values' (McLaren 1983: 205–206).

## 5. Conclusions

The chapter has compared the contribution of nuisance law and regulation to the invention of ‘practicable’ pollution abatement technology, taking a largely historical approach. The chief conclusion is that it is difficult to justify a general view as to whether nuisance law or regulation is ‘good’ or ‘bad’, or fast or slow, at forcing the pace and direction of technological innovation. On this evidence, practice appears to differ from process to process, industry to industry, and from time to time. This is despite substantial continuity in formal law, with little fundamental change from the mid-nineteenth century to the present (either in nuisance law or in regulation).

More specifically, if the contribution of the law were to be periodized, it is noteworthy that the Alkali Inspectorate was most resolute in its commitment to forcing and facilitating the invention of cleaner production processes in its early decades. That is a surprise, for according to the leading historians of this body, early inspectors battled against an inauspicious social and economic milieu:

It is not difficult to imagine the obstacles Smith had to overcome. An isolated government official based in Manchester, with very little backing or guidance from his employers in Whitehall, 180 miles away; empowered to control emissions from a great and flourishing industry. (Ashby and Anderson: 25)

In contrast, the argument above is that inspectors’ biggest contextual constraints emerged in the twentieth century, when industry became less ‘great and flourishing’, and/or Whitehall meddled at every opportunity to ensure the immediate needs of economic growth were put before progressive pollution abatement.

One could begin to devise from this historical experience an—at this stage inevitably crude—‘checklist’ of ‘conditions’ necessary for process standard regulation to progressively shape clean technology, in parallel with nuisance law. This would include the following:

- financially comfortable regulated enterprise;
- benevolent enterprise leaders;
- public-service regulators with a reputation for world-leading scientific expertise; and
- superiors within the executive who trust in regulators’ judgement.

The occurrence of these conditions ‘in parallel’ with nuisance is critically important. This is because at no stage in the period covered by this study has regulation facilitated prototypical pollution abatement techniques to the extent that tort has. For all Dr Smith’s dogged experimentation in the pursuit of technical improvement, the outstanding single individual contribution lies arguably within the judiciary. Lord Westbury’s reformulation of ancient rules of the ‘good neighbour’ in *Tipping* was then, and remains today, critical to remedying pollution in neighbourhoods (as in *Coventry v. Lawrence*).

### References

Ashby E and Anderson M, *The Politics of Clean Air* (OUP 1981)

*Attorney General v. Birmingham Corporation* 1858) 4 K and J 528

Beever A, *The Law of Private Nuisance* (Hart Publishing 2013)

Brenner J, 'Nuisance Law and the Industrial Revolution (1974) 3 Journal of Legal Studies 403

Lord Carnwath, 'Judges and the Common Laws of the Environment—At Home and Abroad' (2014) 26 Journal of Environmental Law 177, 178

Cocks R, 'Richard Bethell, 1st Baron Westbury (1800–1873)' in Oxford Dictionary of National Biography (OUP 2004)

Coventry v. Lawrence [2014] UKSC 13

David v. Vivian, unreported, Carmathen Assizes, 1833

Desrochers P and Haight C, 'Squandered Profit Opportunities? Some Historical Perspective on Industrial Waste and the Porter Hypothesis' (2014) 92 Resources, Conservation and Recycling 179

Epstein R, 'The Social Consequences of Common Law Rules' (1982) 95 Harv LR 1717

Farnworth v. Manchester Corporation [1930] AC 171

Frankel M, The Alkali Inspectorate; The Control of Air Pollution (Social Audit 1974)

Garwood C, 'Green Crusaders or Captives of Industry? The British Alkali Inspectorate and the Ethics of Environmental Decision Making, 1864–95' (2004) 61 Annals of Science 99

Guruswamy L and Tromans S, 'Towards an Integrated Approach to Pollution Control' [1986] JPL 643

Halsey v. Esso Petroleum [1961] 2 All ER 145

Hamlin, C, 'Smith (Robert) Angus, 1817–1884', Oxford Dictionary of National Biography (OUP 2008)

Hawkins K, Environment and Enforcement (Clarendon Press 1984)

LeCain T, 'The Limits of "Eco-Efficiency": Arsenic Pollution and the Cottrell Electrical Precipitator in the U.S. Copper Smelting Industry' (2000) 5 Environmental History 366

Local Government Board, Sewage Farms (Boroughs etc): Return of the names of boroughs, local boards, parishes, and special drainage districts which have through loans provided sewage farms or other means for the disposal of sewage by filtration or precipitation, House of Commons Paper 134 (HMSO 1873)

McLaren J, 'Nuisance Law and the Industrial Revolution—Some Lessons from Social History' (1983) 3 OJLS 155

McLeod R, 'The Alkali Act Administration, 1863–84: The Emergence of the Civil Scientist' (1965) 9 Victorian Studies 85

Manchester Evening News, 'I'm Sorry about the Beetham Tower Howl, Says Architect Ian Simpson' (6 January 2012)

Michelman F, 'Pollution as a Tort: A Non-Accidental Perspective on Calabresi's Costs' (1971) 50 Yale LJ 647

Morag-Levine N, 'Is the Precautionary Principle a Civil Law Instrument? Lessons from the History of the Alkali Acts' (2011) 23 JEL 1

Newell E, "'Copperopolis": The Rise and Fall of the Copper Industry in the Swansea District, 1826–1921' (1990) 32 Business History 75

Ogus A, 'Law and Spontaneous Order: Hayek's Contribution to Legal Theory' (1989) 16 Journal of Law and Society 393

Pontin B, 'Integrated Pollution Control in Victorian Britain: Rethinking Progress within the History of Environmental Law' (1997) 19 Journal of Environmental Law 173

Pontin B, 'Nuisance Law and the Industrial Revolution: A Reinterpretation of Doctrine and Institutional Competence' (2012) 75 Modern Law Review 1010

Pontin B, 'Common Law Clean up of the "Workshop of the World": More Realism about Nuisance Law's Historic Environmental Achievements' (2013a) 40 Journal of Law and Society 173

Pontin B, Nuisance Law and Environmental Protection (Lawtext Publications 2013b)

R (Rockware Glass Ltd) v. Quinn Glass Ltd and Chester CC [2006] EWCA Civ 992

Rees R, 'The Great Copper Trials' (1993) 43 History Today 38

Richardson G, Ogus A, and Burrows P, Policing Pollution: A Study of Regulation and Enforcement (Clarendon Press 1982)

Robinson D, 'Regulatory Evolution in Pollution Control' in Tim Jewell and Jenny Steele (eds), Law in Environmental Decision Making (Clarendon Press 1998) 44–45

Rosenthal L, 'Economic Efficiency, Nuisance, and Sewage: New Lessons from Attorney-General v. Council of the Borough of Birmingham, 1858–95' (2007) 36 Journal of Legal Studies 2

Rosenthal L, The Rivers Pollution Dilemma in Victorian England: Nuisance Versus Economic Efficiency (Ashgate 2014)

Royal Commission on Environmental Pollution, Pollution Control: Progress and Problems (4th report, HMSO 1974)

Royal Commission on Noxious Vapours, British Parliamentary Papers XLIV (HMSO 1878)

Smith A, Intermediate Report of the Chief Inspector of the Alkali Acts, 1863 and 1874 (HMSO 1876a)

Smith A, 'What Amendments Are Required in the Legislation Necessary to Prevent the Evils Arising from Noxious Vapours and Smoke?' (1876b) [1876] Annual Proceedings of the National Association for the Promotion of Social Sciences 495

Smith A, Rivers Pollution Prevention Act 1876: Report to the Local Government Board by Dr R Angus Smith (HMSO 1881)

Smith A, 18th Annual Report of the Chief Alkali Inspector, 1881 (HMSO 1883)

Tipping v. St Helens Smelting Co Ltd (1865) 11 HL Case 642

Warren K, *The Alkali Industry in Britain to 1926* (OUP 1980)

Ernest Weinrib, 'The Special Morality of Tort Law' (1988) 34 McGill LJ 403

Wohl A, *Endangered Lives* (Methuen 1984)

Notes

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**1** Under Part II of the Act, a sewage undertaking was prohibited from discharging solid or liquid effluent into rivers, subject to the defence that it had used 'the best practicable and available means to render harmless the sewage matter so flowing into the stream'. The use of 'practicable' and 'available' is interesting, but neither term was defined.

**2** Rivers Pollution Prevention Act 1876: Report to the Local Government Board by Dr R Angus Smith (1881, Cm 3080), 5 ('I have brought forward several investigations which I hope will be found of value'). For Smith's contribution to science in this area, see Hamlin (2008).

**3** Evidence, George Vulliamy: 'there is a large and growing population of workers connected with the cement works, and they are not the most agreeable people to live amongst, because when you threaten proceedings they mob you, blackguard you, and throw stones at your carriage'.