The scholarly self under threat: language of vice in British scholarship (1870-1910)

Saarloos, J.J.L.

2

Edward Frankland and moral instruction

A young chemist in the metropolis of vice

January 5th, 1848. Late in the evening, a 23-year old man arrived at the docks of London after a trip to the continent. He was well dressed and had many suitcases with him, each of them filled with chemical substances and intricate experimental apparatus. The man had been in London before, had even lived there for a short while, but the experience of standing at the busy docks of the bustling metropolis evoked a moment of reflection. When he arrived at his room to finally get some sleep, he took a moment to write down the result of his reflections. He wrote:

> It was dark when I arrived at the great metropolis of the world; what a scene does this city exhibit to a contemplative mind, its busy thoroughfares tell us of its teeming population, the numerous and splendid equipages remind us of its wealth, and the long line of shops dazzling the eye with the brilliancy and costliness of their contents exhibit to us a striking illustration of its trade, but all wears the aspect of intense selfishness, Money! Money! Wealth! Wealth! is to be got at all hazards, the God Mammon is to be bowed down to and worshipped.[1]

The young man described a city that was overly crowded, luxurious, always busy, and, more importantly, he described it as a place where intense

1 Frankland's Diary [JBP, JRL, 1/3, page 4].

selfishness and egotism reigned supreme. He conjured an image of a city that would be able to fully consume a man with a 'contemplative mind' like himself and as a place where vices of avarice and greed preyed on the weak-willed. London, in other words, was a dangerous place for those that were unable to withstand the threat of vice. His reflection on these matters in his diary suggests that the young man himself was on his guard against 'the God Mammon' and the vices of avarice and selfishness. It was only mindful reflection that made him alert to the dangers of his situation.

The name of the young man was Edward Frankland and in 1848 he was well on his way to becoming a well-known chemist. He had studied with the famous chemist Robert Bunsen in Marburg (and he would return there within a year to pursue his PhD), worked as an assistant to rising star Dr. Lyon Playfair (1818-1898) (who had studied under the renowned Justus von Liebig and was one of his adepts in London), and was at the time of writing a teacher of science at Queenwood College in Hampshire, a Quaker college that offered scientific training to young people. Frankland taught chemistry at Queenwood, and his good friend John Tyndall (whose acquaintance we have made in the previous chapter) taught physics and mathematics. The many suitcases filled with chemicals and apparatus that accompanied Frankland at the docks of London were intended for his classes in Queenwood.

In January 1848, when Frankland reflected on the metropolis in such gloomy terms, describing the city as a den of vice, he had already seen quite a bit of both Britain and the Continent. He had grown up in Lancaster, worked in London and Hampshire, and had travelled abroad to France and Germany. Apparently though, London still presented a scene worth reflecting on in his diary. In fact, many of his other diary entries are quite straightforward, not nearly as poetic and melancholic as his description of the metropolis, and often dealing with the more technical details of his teaching and scientific work. Why would Frankland reserve time and effort for a description of London? And why would he describe

the metropolis in such dark terms, presenting it as a home to vices such as avarice and selfishness? I would argue that Frankland recognised the dangers of London, and wrote in his diary mainly in an effort to remind himself of them and to withstand the perils posed by the city.

Frankland's gloomy words were hardly original. His description of London was reflective of broader Victorian attitudes on the metropolis. In describing the city as a place of greed, egotism, overpopulation, sensation and distraction, Frankland was reiterating contemporary attitudes towards urban life in general, and London in particular. Mike Huggins, in his study on Victorian attitudes towards vice, shows that London had long been envisioned as an archetypical den of vice in the English imagination, an image cultivated by novelists, moral reformers and political and religious commentators alike.[2] Cities were imagined as:

> Places of moral danger, especially to the young. They could be represented as hedonistic and privatized areas of vice, adventure and pleasure, far from the prying eyes of staid church congregations and stern employers or the moral constraints of parents, relations and neighbours.[3]

As this suggests, the overcrowdedness of the city, its many distractions, and the lack of social control were envisioned to be sources of vicious and demoralising behaviour.[4] London in particular was a source of vice, as it was imagined to be the archetypical and ultimate city.[5]

---

2 Huggins, *Vice and the Victorian*s, 4, 33-34, 41; already in early modern times, London was seen as a source of vice, see: Amanda Bailey and Roze Hentschell (eds.), *Masculinity and the Metropolis of Vice, 1550–1650* (New York: Palgrave Macmillan, 2010).

3 Huggins, *Vice and the Victorians,* 41.

4 See also: Houghton, *The Victorian Frame of Mind,* 79, 365-367; for a more general account of all the distractions London had to offer, see: Richard Altick, *The Shows of London* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1978).

5 Huggins, *Vice and the Victorians*, 34.

And there he stood, the young Frankland, in the midst of this 'citadel of vice'.[6] Luckily, he was armed with a 'contemplative mind' and his diary-entry shows that Frankland was mindful of vice, and sought to avoid it. To understand how real the danger must have felt for the young Frankland, and why he portrayed London in such a way, we need to go back to his own moral education. Where did Frankland learn that London was such a dangerous place? And where was he impressed with the idea that avarice, selfishness and egotism were moral dangers for a young chemist like himself?

Let me briefly leave Frankland in London, dangerous as that may be, and return to the main theme of this dissertation. In my introduction, I have suggested that Victorians and Edwardians had two reasons for being so preoccupied with the category of vice. In chapter 1, I have argued that the first reason is that there was a broad consensus among scholars about that their pursuits were threatened by vices: the language of vice offered a common tongue to learned men with which they could speak about matters of scientific selfhood.[7] Victorian and Edwardian writers of scholarly obituaries identified six dangers (uselessness, enthusiasm, prejudice, money, fame, distraction) and offered two remedies (balance and a love of science). I have also argued that memory culture was meant to instruct readers by offering thick descriptions of scholarly lives. But instruction did not start or stop with academic memory culture. In this chapter, I will continue this argument by focusing on the process of moral instruction and academic socialisation. Where and how did Victorians and Edwardians learn that their pursuits were constantly threatened by vices? And how did they learn how to deal with these threats?

Frankland's case shows that even at a relatively young age (he

6 Ibid.

7 I touched upon the second reason for the importance of the category of vice in British scholarship – disagreement about the definition of 'good' science – in the previous chapter, but will expand on that point in chapters 3 and 4 in more detail.

was 23 when he wrote about the dangers of London) the Victorians were imbued with the importance of virtue and habits of reflection for dealing with dangers of vice and temptation. This suggests that the moral instruction of prospective scholars was in fact a very generic process that started during an individual's youth, and was not necessarily reserved for those who specifically sought a scientific career. It is to this relatively generic process of moral instruction that I will turn now. How precisely was Frankland warned about the dangers and vices of London, and how did he learn how to cope with them? What other themes were present in his early moral instruction? And what was the relation between Frankland's general upbringing and his specific academic socialisation?

London and distraction

Already in his early childhood, Frankland was imbued with the image of London as the locus of vice. Major actors in his early moral instruction were of course his parents. Margaret Frankland and William Helm were primarily responsible for his early education at home and for the choice of the schools to which Frankland was sent.[8] During the late 1820s and early 1830s, the family was quite mobile and relocated to and from several villages and towns in Lancashire and around Manchester, but finally settled in Lancaster itself.[9] For this reason, Frankland was educated at many different schools. He preferred James Willasey's scientifically oriented 'Cable Street' school in Lancaster (more about Willasey later), but his parents were bent on sending him to the Lancaster Free Grammar School, where he could learn Latin, a language he came to despise deeply.[10] His parents, moreover, made sure that there were several instructive children's books available and Frankland would later reminisce kindly about his mother's effort to answer

8 Frankland was an illegitimate son from an affair between Margaret Frankland and Edward Gorst: Edward Frankland to Francis Galton, 12 April 1874, copyletter [EFP, JRL, 11/958].

9 Colin Russell, *Lancastrian Chemist: The Early Years of Sir Edward Frankland* (Milton Keynes and Philadelphia: Open University Press, 1986) 37-55.

10 M.N. West and S.J. Colenso (eds.), *Sketches from the Life of Sir Edward Frankland* (London: Spottiswoode & Co., 1902) 11-13.

all of his youthful questions, while his stepfather taught him more practical skills such as woodworking and tool handling.[11]

Especially relevant was a children's book written by Thomas Day (1748-1789), *The History of Sandford and Merton*. The book was first published in 1783, but went through numerous editions during the nineteenth century.[12] In his autobiographical sketches (later compiled by his two daughters), Frankland reminisced fondly about the book, claiming that reading it as a child gave him his first 'impetus towards observation as distinguished from hearsay'.[13] Moreover, Frankland owned not one, but three copies of the book, all three bound in calf leather (which was quite an expensive indulgence), and we also know that Frankland read extensively from the book to his own daughters Maggie and Sophie, signifying the importance he attached to it as a tool for moral instruction.[14]

In *Sandford and Merton*, Thomas Day tells the story of Tommy Merton, a young boy (with whom the youthful readers were meant to identify) on his way to adulthood. This civilisation process was guided by a good mentor, Mr. Barlow, and a virtuous friend, Harry Sandford. It is essentially a moral tale, interspersed with short moral stories filled with commonplaces and speeches by older and wiser mentors. It is therefore a very rich source from which to distil some of the features of the early Victorian moral universe as they would have appeared to young Frankland.[15]

---

11 Frankland referred to his mother as having 'a very retentive memory and vigourous mind': Edward Frankland to Francis Galton, 12 April 1874, copyletter [EFP, JRL, 11/958]. She was also quite given to beating him with a birch rod: West and Colenso, *Sketches*, 5.

12 Thomas Day, *The History of Sandford and Merton* (Chiswick: C. and C. Whittingham, 1828). I refer to the 1828 edition of the book. The 1828 edition has only minor revisions and is one of the many versions of the book that circulated in nineteenth-century Britain.

13 West and Colenso, *Sketches*, 1-4.

14 Russell, *Lancastrian Chemist,* 63-64.

15 A study analysing *Sandford and Merton* in more detail is: Phyllis Gila Reinstein, 'Alice in Context: A Study of Children's Literature and the Dominant Culture in the Eighteenth-Century and Nineteenth-Century' (PhD-dissertation Yale University, ProQuest Dissertations Publishing, 1972).

To return to the topos of London in Frankland's moral instruction, *Sandford and Merton* imagined cities, and the metropolis in particular, to be places from which vices and temptations emanated. Throughout the book, bustling cities were portrayed as places of 'violence and treachery', where 'city-prejudices' were acquired, and contrasted to the more peaceful countryside, where virtue was allowed to grow and companionship and kinship held vices at bay.[16] The Scots, in a lengthy aside, were praised for their 'warmth of . . . affection', and their minds were imagined to be 'untainted by the example of their more luxurious neighbours'.[17] As a boy, Frankland had already learned that cities like London were places of vice that should be distrusted, while the rural landscape of Lancaster, a place he would leave behind for good, was considered virtuous. Would Frankland have thought of his favourite book when he stood in London at night, and reflected so gloomfully on the nature of the city?

Victorian moral instruction relied heavily on the kind of *indirect* moral instruction exemplified by *Sandford and Merton*. Practitioners of this form of moral instruction stressed the importance of role models and moral exemplars.[18] Samuel Smiles' biographical work on self-made scientific men and their exemplary character is a clear example, and so is the whole array of Victorian's children's literature providing images of heroes and villains, the former clearly designed for emulation.[19] This indirect moral instruction was commonly deemed more effective, because Victorians believed that

16 Thomas Day, *The History of Sandford and Merton*, 102, 36.
17 Ibid. 148, 118.
18 Roberts, 'Character in the mind', 193-196. Paul Elliott & Stephen Daniels, 'Pestalozzianism, natural history and scientific education in nineteenth-century England: the Pestalozzian Institution at Worksop, Nottinghamshire', *History of Education* 34:3 (2005) 295-313.
19 Peter Merchant, '"Fresh Instruction o'er the Mind": Exploit and Example in Victorian Fiction', *Children's Literature in Education* 20:1 (1989) 9-24; Jeffrey Richards, 'Spreading the Gospel of Self-Help: G.A. Henty and Samuel Smiles', *Journal of Popular Culture* 16:2 (1982) 52-65; J.F.C. Harrison, 'The Victorian Gospel of Success', *Victorian Studies* 1:2 (1957) 155-164; Anne Secord, '"Be what you would seem to be": Samuel Smiles, Thomas Edward, and the Making of a Working-Class Scientific Hero', *Science in Context* 16 (2003) 147-173.

pupils were naturally more interested in moral tales than in direct lessons, and, more importantly, that indirect instruction was more prone to shape the character of a pupil.[20] The image of London in Victorian culture was an image of danger, vice, and moral degradation, and *Sandford and Merton* was probably one of the many indirect sources that conveyed this image to the young Frankland.

Nonetheless, there were also more *direct* forms of instruction. These included corporal punishment, discipline, the awarding of prizes to exemplary pupils, and the imparting of direct moral lessons.[21] Especially Frankland's early teachers often used such direct forms of moral instruction, mostly in the form of short pieces of advice, aphorisms and other shorthands. The image of London as a place of vice was a recurring topos in their teachings.

James Willasey, the schoolmaster of a school at Cable Street in Lancaster that Frankland attended for a few years, was a key player in Frankland's moral education. Frankland even credited him with awakening his own interest in nature and remained in touch with him until Willasey's death in 1875.[22] One important function of Willasey in Frankland's instruction was his impartment of moral lessons. Like *Sandford and Merton*, Willasey warned Frankland about the big city. In his *Hints on Education,* Willasey reflected briefly on the dangers of the city to the education of Britain's youth. He argued that without educational reform, Britain's youth would fall prey to the 'slavery of ignorance and vice'.[23] Without a combined effort by clergy and schoolmaster, urban children would be 'parading the

20 Roberts, 'Character in the Mind', 193.

21 For corporal punishment (and its ineffectiveness), see: Jacob Middleton, 'The Experience of Corporal Punishment in Schools 1890–1940', *History of Education* 37:2 (2008) 253-275.

22 Willasey even left his belongings to Frankland, which included an engraved seal for a watch, which Frankland would wear on his own watch ever since, to keep Willasey close to his heart: West and Colenso, *Sketches*, 10.

23 James Willasey, *Hints on Education* (London: Simpkin, Marshall and Co., 1852) 24.

streets, and strolling idly about the suburbs', and becoming prey to vice.[24] In other passages, the city was also explicitly linked to vice, idleness, ignorance and moral degradation, and cities were associated quite directly with 'vagrant or mendicant children'.[25] The city, in Willasey's reading of it, was a place of barbarism, where vices reigned if civilisation and education did not prevail.

Willasey reserved an important role for teachers in bringing civilisation to the British youth:

> Society would undoubtedly retrograde, and gradually fall back into barbarism without them; by their patient endurance in teaching the young, repressing the buoyancy of their spirits, which would lead them astray, and instilling betimes into their minds useful maxims for self governance in the world, they effectually prevent retrogression, and ensure progressive advance in civilization.[26]

Teachers, Willasey reflected on his own role, were to be a counterweight to the forces of vice and moral retrogression, and they needed to instil the youth with the right 'maxims for self governance' in order to stop the tide of barbarism. As we shall see later on, Willasey imparted those maxims of self-help to Frankland as well.

Also influential in the shaping of young Frankland's attitudes was the Johnson family. The Johnsons (Christopher Sr., Christopher Jr. and James) were physicians and provided all kinds of scientific services in Frankland's Lancaster of the 1830s and 40s, with a view to improving the circumstances, and the moral and intellectual level of the working classes in Lancaster.[27] They, for instance, established a small cottage laboratory in

24 Ibid. 23.
25 Ibid. 16.
26 Ibid. 17.
27 Although the perceived audience for such efforts of popular education was working men, they often drew a distinctively middle class audience: Jonathan Topham, 'Science and popular education in the 1830s: the role of the *Bridgewater Treatises*', *British Journal for the History of Science* 25:4 (1992) 397-430, 398-399.

Lancaster, in which (very crude and basic) chemical experiments could be performed, and they offered demonstrations of simple experiments and lent out instruments.[28] Moreover, they organised and performed lectures in the Lancaster Mechanics' Institute.[29] Finally, the Johnsons offered Frankland a way out of Lancaster and a way into a chemical career: they used their contacts in London to land Frankland a job as lecture assistant to the renowned chemist Lyon Playfair at the Putney College for Civil Engineering.[30] Frankland left for London in 1845.

Interestingly, the same person arranging Frankland's job in London and helping him on his path to becoming a chemist, Christopher Johnson Sr., also cautioned him about the metropolis. In a letter to Frankland just months after Frankland had left for the metropolis, Johnson issued a warning to the ambitious young chemist. He wrote:

> You must work away steadily in the Laboratory and make constant notes of every thing you do and see. In a great place like London there will always be occurring sights to see and take you from your studies unless you are very resolute and conscientious. Your future prosperity will be very materially influenced by the way you employ your time.[31]

The letter is very telling. Firstly, it identified London as a place of distraction, which presented a clear danger to Frankland's ambitions as a chemist and his future chances of a career. Secondly, Johnson offered clear-cut advice

28 Colin Russell, *Edward Frankland: Chemistry, Controversy and Conspiracy in Victorian England* (Cambridge: Cambridge University Press, 2003) 12-13.

29 For an interpretation of mechanics' institutes in nineteenth-century Britain as centres of social control over the lower classes, see: Steven Shapin and Barry Barnes, 'Science, Nature and Control: Interpreting Mechanics' Institutes', *Social Studies of Science* 7 (1977) 31-74; another view, stressing the idiosyncrasy of local mechanics' institutes, and their goals of scientific instruction rather than social control, see: Topham, 'Science and popular education', 405-419.

30 They wrote to some of their influential contacts in London: Russell, *Edward Frankland*, 12, 21.

31 Christopher Johnson to Edward Frankland, 17 October 1845 [EFP, JRL, 38/3469].

on how to deal with the seductions of London: the cultivation of virtues such as resoluteness and conscientiousness, and the habits of hard work and constant note taking.

Although it comes across as a commonplace, this was a piece of direct moral advice that was sure to appeal to Frankland's own dispositions at the time, having been raised in an environment where such commonplaces had been repeated over and over again, directly and indirectly, in the teaching at the schools he attended and in the children's literature he had read. The centrality of habits and virtues to overcome vices and temptations, moreover, indicates that the theories of self-help and self-improvement that would cause such a furore over the course of the century were already well entrenched in early Victorian practices of education, as has been suggested by various scholars.[32] Moreover, those visions of London as a place of vice and moral degradation, where one could easily be tempted and distracted from things that mattered, were confirmed in reality by the fate of some Lancashire men that Frankland knew personally through his internship to a local druggist, Stephen Ross. One died, 'very young, soon after he came to London, from illness brought on by indulgence in London dissipations', while another 'committed some act of peculation in London'.[33]

Both indirect sources of moral instruction, such as novels, children's books, and sermons, and direct experiences such as letters from mentors and anecdotes of unfortunate men who fell for the vices of London, impressed Frankland with the strong conviction that cities, as opposed to the rural and virtuous countryside, were places of vice, and that London, as the archetypical and ultimate city, was the most dangerous of all. Luckily, he knew just what to do. His moral instruction had not only helped him to identify the dangers of the city, it had also taught him how to deal with these dangers. He had to employ the appropriate habits of hard

32 Travers, 'Samuel Smiles'; R.J. Morris, 'Samuel Smiles and the Genesis of *Self-Help*; The Retreat to a Petit Bourgeois Utopia', *Historical Journal* 24:1 (1981) 89-109.

33 West and Colenso, *Sketches*, 23.

work and conscientious note taking, practice virtues of laboriousness and resoluteness, and focus himself on things that mattered, like science.

Let us return then, to the 23-year-old Frankland, who was writing in his diary after arriving in London late at night. What might seem to simply be another commonplace description of dark and dangerous London was in reality an exercise in self-control and a performance of virtuousness.[34] In describing London as a locus of vice, distraction, avarice and intense selfishness, and by presenting himself as a 'contemplative mind', detached from these sources of moral degradation, Frankland in effect avoided these temptations. Moreover, writing in his diary was exactly the kind of habit that Johnson wanted him to acquire when he advised him to 'take constant notes of every thing you do and see'. Through writing, then, Frankland reminded himself of the virtuous lessons of his Lancashire upbringing.

What does this episode from Frankland's moral instruction tell us? First of all, this episode reminds of the themes I have discussed in the previous chapter on academic memory culture. Obituary writers distinguished between six types of dangers and offered two remedies. In Frankland's moral instruction we can already recognise these themes, in a somewhat different form. Frankland was warned specifically for the vices of avarice, prejudice (or 'city-prejudice') and distraction, and, interestingly, was also offered the two remedies that academic memory culture offered: balance and a love of truth. Ross' note is a case in point: he warned for the dangers of city-life and immediately prescribed two virtues that would counter these wicked influences. Likewise, Willasey's reflections on education show that he was afraid that young people would be 'led astray'

34 Diary writing has been fruitfully analysed by historians as a process of self-fashioning, self-disciplining, and even self-creation. See for an overview of perspectives on diary writing and the self: Peter Heehs, *Writing the Self. Diaries, Memoirs, and the History of the Self* (New York: Bloomsbury Academic, 2013) 6-9. In fact, Frankland's dearest friend John Tyndall kept a journal himself, which was a practice in self-denial and self-development, according to Ian Hesketh's convincing analysis: Ian Hesketh, 'Technologies of the Scientific Self: John Tyndall and His Journal', *Isis* 110:3 (2019) 460-482.

by the 'buoyancy' of their own desires, signifying that their desires had to be disciplined. Nonetheless, the instruction that Frankland received was less specific than the instruction offered in academic memory culture: it was aimed at becoming a good person, rather than a good scholar.

As historiography shows and Frankland's case illustrates, Victorian educators imagined life to be a constant struggle against vice.[35] A lot was at stake: the only alternative to civilisation was barbarism and moral degradation, and, therefore, it was paramount that Victorians learned as early as possible how to behave virtuously. Frankland's case shows that scholars learned how to withstand temptations and vices well before they were socialised into an academic environment. During a more generic process of moral instruction that started back in their early childhood, Victorians were inculcated with a fundamental set of moral virtues, upon which later university teachers, academic memory culture, and other sources of learned instruction could build.

Historiography: moral instruction and academic socialisation

This last claim is quite a bold one, with considerable consequences for how we understand the moral economy of Victorian scholarship and the processes of socialisation into this economy.[36] I have argued in the previous chapter that virtues and vices were central to how Victorians imagined the pursuit of knowledge and their role in it: scholarship was essentially a matter of withstanding the threats that beset the scientific self through the practice of virtues and the disciplining of desires. However, Frankland's case shows us that being socialised into this moral economy was not essentially a scholarly process, but rather a broader cultural process of moral instruction that started well before prospective students even entered the institutions associated with scholarship. Specific academic instruction built on that

35 I will discuss this historiography in the next section.

36 For an exploration of the concept of moral economy in science, see: Daston, 'The Moral Economy of Science', 24

process.

There is a huge number of studies focusing on processes of academic socialisation, university education, teacher-student relationships, and ideals of university education, but the majority of those studies focus on the period in which prospective academics were formally educated and socialised into academic circles.[37] A somewhat smaller group of studies focuses on socialisation into the norms, attitudes and ideals of academic selfhood.[38] Both Kasper Eskildsen and Jo Tollebeek have argued, for example, that a university education was often a very intimate affair, designed not only to teach pupils a scientific method, but also to shape their character and to initiate them into the moral economy of science.[39] However, there is no account, other than biographical studies of individual scientists, that probes the period preceding such formal socialisations into

37 Good examples for the British context are: Rothblatt, *The Revolution of the Dons*; Reba Soffer, *Discipline and Power;* Engel, *From Clergyman to Don*; Charles Newman, *The Evolution of Medical Education in the Nineteenth Century* (Oxford: Oxford University Press, 1957); Robert Bud and Gerrylynn Roberts, *Science versus Practice: Chemistry in Victorian Britain* (Manchester: Manchester University Press, 1984); Slee, *Learning and a Liberal Education.*

38 Warwick, *Masters of Theory;* Thomas Bonner, *Becoming a Physician. Medical Education in Britain, France, Germany, and the United States, 1750-1945* (Oxford: Oxford University Press, 1995), especially chapters 7-10 and 12; for the German context, see: Kathryn Olesko, *Physics as a Calling: Discipline and Practice in the Königsberg Seminar for Physics* (Ithaca, NY: Cornell University Press, 1991); and Frederick L. Holmes, 'The Complementarity of Teaching and Research in Liebig's Laboratory', in Kathryn Olesko (ed.) *Science in Germany: The Intersection of Institutional and Intellectual Issues*, Osiris 5 (1989) 121-164. For more theoretical and methodological accounts, see: David Kaiser (ed.), *Pedagogy and the Practice of Science. Historical and Contemporary Perspectives* (London: MIT Press, 2005), esp. the introduction, chapter 4, and the conclusion; Kathryn Olesko, 'Science Pedagogy as a Category of Historical Analysis: Past, Present, and Future', *Science & Education* 15:7 (2006) 863-880; and Kathryn Olesko, 'Tacit Knowledge and School Formation', *Osiris* 8 (1993) 16-29.

39 Eskildsen, 'Private Übungen und verkörpertes Wissen', 160-161; Jo Tollebeek, *Fredericq & Zonen: Een antropologie van de moderne geschiedwetenschap* (Amsterdam: Bert Bakker, 2008), 74–78.

academic norms, attitudes and ideals.[40]

This is all the more remarkable, since some of the studies focusing on academic socialisation explicitly call for a 'culturally- and contextually oriented history of science pedagogy', that takes into account the 'importance of silent and steady traditions' to 'understand reproducible action' as well as 'reasons for its reproducibility'.[41] David Kaiser and Andrew Warwick, for example, call for studies that place 'science and scientific education in a broader cultural context', while at the same time analysing 'the cultural values of science itself' and their transmission.[42] They argue that a study of scientific education cannot do without attention to broader cultural contexts. It is therefore curious that most studies of science pedagogy neglect the period of broader cultural socialisation, taking place well before youngsters entered the university. This also raises the question what exactly was learned during practices of academic socialisation, given the fact that a broader moral instruction had already taken place. I will argue later that socialisation into the moral economy of science was built on these more generic processes of socialisation into ambient Victorian culture.[43]

The broader process of Victorian moral instruction is amply

40 A thought-provoking study focusing on the period *after* formal socialisation is: Katharina Manteufel, 'A Three-Story House: Adolf von Harnack and Practices of Academic Mentoring around 1900', *History of the Humanities* 1:2 (2016) 355-370. There are numerous biographies of Victorian scholars, but touching upon issues of selfhood and the moral dimensions of scientific practices are: Endersby, *Imperial Nature*; Roland Jackson, *The Ascent of John Tyndall. Victorian Scientist, Mountaineer, and Public Intellectual* (Oxford: Oxford University Press, 2018); Jones, *Intellect and Character in Victorian England.*

41 Olesko, 'Science Pedagogy', 877.

42 David Kaiser and Andrew Warwick, 'Conclusion. Kuhn, Foucault, and the Power of Pedagogy', in: Kaiser (ed.), *Pedagogy and the Practice of Science*, 393-409, 405-406.

43 Lorraine Daston, in her article on moral economies in science, also reflects on the relationship between moral economies of science and ambient culture at large. She argues that 'moral economies of science derive both their forms and their emotional force from the culture in which they are embedded', which underlines the point I make here. See: Daston, 'The Moral Economy of Science', 24.

covered in literature. I have drawn attention to this literature on moral instruction in the introduction to this dissertation, but I will repeat some of the points here, with an emphasis on instruction, because moral instruction cannot be discussed without expanding on the work of Stefan Collini on the notion of character. 'Character', Collini argues, was a notion that 'enjoyed a prominence in the political thought of the Victorian period that it had certainly not known before.'[44] Collini shows that the importance of a good character, taken as 'the sum of the mental and moral qualities' of a person, was envisioned to be paramount to the flourishing of the British Empire, the British people, and their ideals of freedom and future progress.[45] Traits such as 'self-restraint, perseverance, strenuous effort, courage in the face of adversity' were deemed central to a good character, as mentioned earlier in the introduction.[46] Instilling these traits –shaping character– was, however, not straightforward. With reference to John Stuart Mill, Collini shows that the notion of character was problematic: on the one hand, individuals were expected to be authors of their own fate, shaping their own circumstances, which in turn shaped their character, while on the other hand, there were constant references to circumstances that effectively denied individual agency in these matters. Nonetheless, the notion of 'character', as Collini states, 'represented a prize worth fighting for' and was central to the efforts of many public educators and political thinkers.[47]

Crucially, and this is where I go beyond the matters I have already touched upon in the introduction, Collini argues that good character consisted of good habits that were preferably cultivated during an individual's youth; forming and cultivating the appropriate habits in youngsters was therefore fundamental to their later moral conduct in life.[48]

---

44 Collini, 'The Idea of 'Character'', 31.

45 Ibid. 33, 41.

46 Ibid. 36; these traits were distinctively masculine, and an ideal catalogue of virtues for women would list very different traits. See also: Collini, *Public Moralists.*

47 Ibid.

48 Ibid. 34-36. This point is also made in: Roberts, 'Character in the mind'.

On the other hand, if bad habits were developed during one's youth, the consequences would be dire: bad habits led irrevocably to the corruption of the will, falling for temptation, and a vicious character.[49] Collini does not go as far as to say that an individual's childhood formed a fixed character for life, but does emphasise the fact that Victorians considered 'a good training' of character and the will in early years crucial to the formation of good habits.[50] Nathan Roberts adds the following:

> To educate for character was, in the eyes of late Victorians and Edwardians, not merely the priming of young gentlemen for imperial duty, but the process by which the young were instilled with those qualities of citizenship that would guarantee the vitality and efficiency of the social organism.[51]

This shaping of the characters of young gentlemen, Roberts shows, became even more pressing when anxieties about decline and international competition started to play a bigger role in the latter half of the nineteenth century.[52]

Although the shaping of character was not exclusively a childhood affair, Victorian thinkers, the above suggests, did consider this period as crucial to moral development. Moral progress depended on the virtuous habits of the populace and good habits, Victorians were convinced, were most successfully inculcated during someone's youth. Moral instruction, in this view, was a civilisation process that lifted a young boy or girl from their depravation into civilised society.[53] This view is underlined when the

---

49 Collini writes that only a strong will could best 'various forms of temptation', while Roberts shows that the Victorians believed that a lack of will or sound habits could lead to vices of untrustworthiness, ineffectiveness and narrowness of mind. Collini, 'Character', 47; Roberts, 'Character in the mind', 189.

50 Collini, 'Character', 36.

51 Roberts, 'Character in the mind', 178

52 Ibid. 197.

53 The perceived end goals of this civilisation process, however, were divided along gendered lines. See: Joan Burstyn, *Victorian Education and the Ideal of Womanhood* (London: Croom Helm, 1980).

views of one of the great Victorian moral educators are taken into account; the views of Samuel Smiles (1812-1904).[54] Smiles was the prolific author of *Self-Help* (1859), a best-selling book in which he presented his readers with all kinds of moral exemplars, ranging from successful businessmen to hardworking scholars, with a view to teaching his audience that the virtues of self-discipline, conscientiousness and perseverance were crucial both for the successes of the individual and the well-being of the state.[55] Smiles further unpacked (and repeated) his views on character in a later book, aptly named *Character* (1871), but the central tenets of *Self-Help* remain intact.[56]

Smiles' views on character, morality, and education, however, were reflective of broader cultural trends: 'he did no more than restate in attractive form a doctrine that had already begun to appear elsewhere' and was building on a 'complex set of ideals and values that had already been worked out in, and expressed by, small groups of improvers for at least two generations.'[57] So although Smiles published his *Self-Help* late in the 1850s, the ideas he popularised were already widespread in the 1830s and 1840s, at least among the middle classes and especially in the *petite bourgeoisie*.[58] Edward Frankland himself grew up as a member of this 'petty bourgeoisie' in Lancaster and was thus very much exposed to the efforts of moral reformers; some of Frankland's teachers even identified themselves as 'moral reformers' and were engaged in shaping the ideas and practices that Smiles would later codify. As such, much of the moral instruction that

54 See note 19 in this chapter.

55 One of the best general introductions to Smiles' *Self-Help* is Peter W. Sinnema's introduction to the *Oxford World Classic* version of the book: Samuel Smiles, *Self-Help. With Illustrations of Character, Conduct, and Perseverance* (Oxford: Oxford University Press, 2002).

56 Samuel Smiles, *Character. A Book of Noble Characteristics* (London: John Murray, 1871).

57 Harrison, 'The Victorian Gospel of Success', 156; Anne Baldz Rodrick, 'The Importance of Being an Earnest Improver: Class, Caste, and Self-Help in Mid-Victorian England', *Victorian Literature and Culture* 29:1 (2001) 39-50, 39.

58 Morris, 'Samuel Smiles and the Genesis of Self-Help'.

I will discuss here had distinctive lower middle-class features.[59]

Especially interesting for my purpose here is Smiles' educational timetable (loosely based on Rousseau's timetable), in which childhood was presented as the essential period in which moral education needed to take place, and adulthood was designated as the appropriate time for intellectual self-education.[60] These stages, moreover, were hierarchical: there was no intellectual self-education possible if moral instruction was lacking. Morality, in other words, preceded knowledge.

The enormous importance that Smiles attached to moral childhood instruction in his developmental scheme was embedded in the broader Victorian belief that a child coming of age 'worked through a progression from savagery to civilisation analogous to that of the white European races.'[61] Moral instruction and the acquisition of good habits, in this view, were essentially civilisation processes, which had to be guided by teachers: 'the young were led from external control to the self-guidance and self-scrutiny that marked the fully developed citizen.'[62]

So although the many studies on character, habit, and virtue in Victorian intellectual and political thought teach us that a crucial role was reserved for the moral instruction of the young, it is surprising that historians of science and the humanities have taken up the concepts of character, virtue and habit, but have not incorporated the developmental model in which these notions were embedded. It was precisely one's childhood that prepared the individual for a productive and virtuous adulthood. Academic socialisation was built upon a more fundamental process of moral instruction.

59 Self-education and self-discipline worked differently for members of the working class, as Anne Secord has shown: Secord, '"Be what you would seem to be"'.

60 Travers, 'Samuel Smiles', 166-167.

61 Roberts, 'Character in the Mind', 191.

62 Ibid. Roberts also shows how this developmental model was naturalised over the course of the century, as evolutionism provided new concepts for discussing these matters.

But how exactly were these virtuous habits cultivated? What upkeep did it need, and how did Victorians ensure that they did not forget their youthful moral instruction in later years? Frankland's case has already shown that both direct and indirect forms of instruction were employed, and that his moral instruction relied on the creation of powerful images (London as the metropolis of vice, the city as a source of temptation, or the countryside as virtuous) during his childhood. An exploration of two other recurring themes in Frankland's moral instruction, avarice and selfishness, might shed some more light on the mechanisms of moral instruction in Victorian Britain and the relationship between generic processes of moral instruction and more specific scientific processes of academic socialisation. The vices of avarice and selfishness were imagined to be even more dangerous than the temptations of London, because they could strike anywhere and at any time. To withstand those vices, constant vigilance was needed.

Avarice

Let me start with avarice.[63] The greedy pursuit of money for money's sake and the devious exploits of the 'God Mammon' to which Frankland referred in his diary make up the first recurring theme in Frankland's moral instruction. Again, the dangers of moneymaking were instilled in him even at a very young age. His favourite book, *Sandford and Merton*, is full of references to the vices of greed and the temptations of wealth. As usual, the author relied on fables or metaphors to drive his point home.[64] One fable, telling the story of two brothers –Pizarro and Alonzo–, was meant to instil virtues of prudence and habits of frugality in its young readers.

When stranded on a desert island, the two brothers Pizarro and Alonzo each went their separate ways with their respective crews. Pizarro

63 I have shown in the previous chapter that moneymaking for money's sake was also a major theme in academic memory culture – scholars should love science over money.

64 Reinstein, *Alice in Context,* 35.

headed for the mountains of the island and started digging for gold, finding enormous amounts of it, but losing half his crew in the process due to hunger and thirst. Alonzo, on the other hand, had his men grow crops, which led to a bountiful harvest. When the famined Pizarro came back from the mountain and saw Alonzo's harvest, he asked for food. Alonzo refused him, arguing that Pizarro would have to pay, which the latter declined. Alonzo, giving in, then proceeded to lecture Pizarro (and the readers of the book): 'I saw the rash, impetuous desire you had of riches . . . you despised my prudence and industry, and imagined that nothing could be wanting to him that had once acquired wealth; but you have now learned that without that foresight and industry, all the gold you have brought with you would not have prevented you from perishing miserably.'[65] The moral of this fable is clear: those who desire money at the expense of everything else will eventually lose everything, whereas those who possessed virtues of prudence and industry will have all they need.

Besides the indirect moral influence that Thomas Day's book might have yielded, Frankland was also more directly instructed to eschew moneymaking. James Willasey's teaching was a case in point. Willasey, who sought to provide the youth with 'maxims for self governance in the world', explicitly offered such maxims to deal with the temptation of moneymaking. Frankland, in his personal archive, kept a sheet of paper (in an envelope on which was written: 'Mr. Willasey on Conduct') on which Willasey had written some of such maxims, in the form of aphorisms:

> It is not what we eat, but what we digest that makes us strong. It is not what we earn, but what we save that makes us rich. It is not what we read, but what we remember, that makes us learned. It is not what we profess, but what we practice, that makes us righteous.[66]

Especially the second aphorism, 'it is not what we earn, but what we save that makes us rich', is of interest here. At the very least, this aphorism can

65 Day, *Sandford and Merton,* 58.

66 Quotation by Willasey, date on envelope 12 July 1866 [EFP, JRL, 35/2917].

be interpreted as an advice to Frankland to behave frugally and to practice prudence; a virtuous habit that was also advised in Thomas Day's *Sandford and Merton*.

However, the most interesting thing about Willasey's aphorisms is that they were very mobile, in the sense that they could be applied to many situations besides the actual saving of money. As such, the aphorisms are akin to many other moral shorthands and proverbs. All are short, mnemonically robust, metaphorical and contextually mobile figures of speech; characteristics which make such shorthands an ideal *heuristic*, in the sense that they offer possibilities to deal with all kinds of problems of scientific selfhood.[67] Willasey's saying about saving and earning could easily apply to other situations and had a similar meaning to the other aphorisms: good character is shown through good conduct. In other words, Willasey provided Frankland with a mobile *habit* of thought (or a 'maxim of self governance', to use his own words), a way of dealing with complex situations in which matters of character were at stake.

Willasey's aphorisms were a clear example of generic and broad moral instruction. Willasey wanted to stimulate the performance of virtuous habits of thought in the young Frankland, and his aphorisms were not specifically meant to socialise Frankland into scientific circles, but rather into becoming a good citizen in general. They stressed the importance of virtues like prudence, laboriousness and truthfulness, the cultivation of which was also a major part of Willasey's curriculum at the school at Cable Street. Although science played a big role in his curriculum, this was because he envisioned scientific training to benefit a good character.[68] As such, Willasey's aphorisms were not only mobile and mnemonically powerful heuristics; they were also the carriers of more general ideas about self-help, and moral and national progress.

Frankland himself also regarded Willasey's aphorisms as pieces

67 Steven Shapin, 'Proverbial Economies', 735-743.
68 West and Colenso, *Sketches*, 6-10.

of general moral instruction and passed Willasey's lessons on to his own children and grandchildren. In 1896, Frankland received a letter from his daughter Sophie (who was then 41 years old and had four teenaged children), in which she asked for a copy of 'Mr. Willasey's excellent saying' for her scrapbook. The saying referred to was the quote of Willasey on conduct.[69] Willasey had been dead for 26 years, but his 'maxims of self governance' lived on in the next generation. Likewise, Frankland used to read from *Sandford and Merton* to his daughters in order to pass on the same moral habits he learned to cultivate in his youth.[70] His daughters did not pursue a scientific career, which supports the view that these lessons were part of generic moral instruction.

The temptation of money and the vice of avarice, however, also play a major role in discussions about scientific selfhood specifically. As I have argued in the previous chapter, Victorian academic memory culture was very much preoccupied with the danger of money: it constructed an image of moneymaking as a danger to knowledge production, because a desire for money would come at the expense of the love of truth. Frankland's moral education suggests that he learned how to deal with avarice already at a young age: he learned that prudence, habits of hard work and self-discipline were weapons against temptation. But some of his other teachers, who morally instructed Frankland when he was already on the track of a chemical career, gave more substance to this vice: they did not teach him that avarice was dangerous (he had already learned that), but they did tell him what the sources of avarice where in scientific situations. Moral instruction did not stop after childhood, but became more specific.

Let me explain by referencing the teaching of Christopher Johnson again. We have already seen that he cautioned Frankland for the dangers of the metropolis, and advised him to work hard, be conscientious and resolute, and not be distracted. In 1847, when Frankland had been in

69 Sophie Colenso *née* Frankland to Edward Frankland, 12 November 1896 [EFP, JRL, 14b/1408].

70 See note 12 in this chapter.

London for two years and had recently accepted a Professorship at the Royal Agricultural College in Cirencester, Johnson wrote again to congratulate his former pupil and, more importantly, to caution him for his chosen path.[71] He wrote:

> Let me earnestly caution you against too ready a credence to the assertions and presumptions of the Modern School of Agricultural Chemistry, and against the suicidal practice of hewing out large promises of profit or money, which Chemistry never will or can realise to the farmer.[72]

Johnson cautioned Frankland not to adhere too much to what he called the 'Modern School of Agricultural Chemistry', because of its 'suicidal practice' of promising money to farmers by means of chemical innovations. According to Johnson, this was a promise chemistry could not deliver. To understand what was at stake here, these allegations need to be contextualised.

The fear of modern agricultural chemistry and the false promise of profit echoed a larger anxiety concerning the promises of modern agricultural chemistry, especially since this chemical school was associated with the figure of Justus von Liebig, who was both admired and abhorred in Britain.[73] Liebig had pioneered the study of modern agricultural chemistry and had sought to relate the science of chemistry to the practice of farming.[74] Through Playfair, who had studied under Liebig, Frankland came under the influence of the latter.

---

71 Frankland would decline the professorship eventually to make time for a longer stay at the labs of Bunsen in Marburg: Russell, *Edward Frankland*, 29.

72 Christopher Johnson to Edward Frankland, 9 April 1847 [EFP, JRL, 30/2431].

73 For the admiration of Liebig in chemical circles, see: Robert Hugh Kargon, *Science in Victorian Manchester: Enterprise and Expertise* (Baltimore: Johns Hopkins University Press, 1977) 101-108.

74 William H. Brock, *Justus von Liebig. The Chemical Gatekeeper* (Cambridge: Cambridge University Press, 1997), especially chapter six on 'Liebig and the Farmers' is of interest for the debate on agricultural chemistry.

There were two main reasons for the distrust of Liebig that Johnson's letter betrayed. First of all, Liebig was German and matters of chauvinism and national prejudice played a major role in the acceptance of German chemical theories.[75] Secondly, Liebig's new agricultural chemistry had made Liebig himself quite a wealthy man, a fact which to some commentators was at odds with his propagation of pure fundamental science.[76] Liebig's agricultural chemistry was therefore distrusted, as its practitioners were suspected to work for money rather than truth. Especially among British farmers, this view of Liebig persisted well into the latter half of the century.[77] Matters of virtue and vice were therefore also at stake: how should aspiring chemists reconcile their goals of fundamental science and disinterestedness with the very real possibilities of a lucrative career?[78] The subtext of Johnson's letter implied that Frankland should resist the temptation of modern agricultural chemistry, because of its association with avarice.

This is an interesting observation. Victorian moral instruction (which advised to not pursue money for its own sake, and instead practice prudence and self-discipline) provided a moral basis upon which later processes of academic socialisation could build. Johnson could build on generic moral instruction by identifying the sources of the temptation of money in chemical pursuits specifically. The role of academic socialisation, as distinct from more generic moral instruction, then, was to lend shape to the moral universe of youngsters. They had already learned that vices such as avarice and temptations of money-making were to be resisted and that they could indeed be resisted by cultivating virtuous habits such as hard work and prudence, but academic socialisation taught the specific nature of

75 Rocke, 'Pride and Prejudice in Chemistry'.

76 The negative reception of Liebig's theories is covered less well in literature, but an example is: W.H. Brock, 'Liebigiana: Old and New Perspectives', *History of Science* 19:3 (1981) 201-218.

77 Lesley Kinsley, 'Guano, Science, and Victorian High Farming. An agro-ecological perspective', in: Wendy Parkins (ed.), *Victorian Sustainability in Literature and Culture* (New York: Routledge, 2018) chapter 7.

78 For the aspirations of the chemical community in Victorian Britain, see: Bud and Roberts, *Science versus Practice*.

such vices and temptations as far as scholars were concerned. For chemists, Johnson's example shows, Liebig's brand of modern agricultural chemistry was a source of temptation.

One of Frankland's later mentors, the famous chemist Robert Bunsen, engaged in the same kind of shaping of the moral universe of the young Frankland. He did so not through direct instruction, but by becoming a model of scientific selfhood, one that Frankland could emulate.[79] In academic memory culture, 'Bunsen' came to stand for a particular brand of chemistry that was said to be 'unalloyed by any attempt to make capital out of any application of his discoveries'.[80] As this last qualification suggests, the model that Bunsen was to become prescribed its followers to eschew moneymaking and applied chemistry, and to be dedicated to fundamental research.

Other sources unpack this view of Bunsen further:

> It was a fine trait in his character that he had no monetary ambition. He not only disliked anything savouring of money-making out of pure science, but he could not understand how a man professing to follow science could allow his attention to be thus diverted form pure research.[81]

Bunsen taught that pure science was the antidote against selfish moneymaking. The memory culture surrounding Bunsen continually stressed this antithesis between moneymaking through applied chemistry on the one hand, and pure science on the other. Bunsen was represented as someone with a 'constant and unselfish devotion'[82] to science, and as being

79 The role of such role-models or *personae* in academic socialisation has been explored in: Katharina Manteufel, 'A Three-Story House'.

80 Obituary of Robert Bunsen in Nature, written by Henry Enfield Roscoe, 31 August 1899 [HRP, JRL, 963, page 12]. For an account of how shorthands (like 'Bunsen') came to stand for specific ways of being a scholar, see: Paul, 'The Virtues of a Good Historian in Early Imperial Germany', 20-23.

81 Ibid.

82 Address to Professor Bunsen, 1892 [EFP, JRL, 13/1099].

a beacon of 'devotion and zeal' to his students.[83] As such, this model of being a chemist invited emulation, as one commentator reminisced: 'This literature is to scientific men like the lives of the saints to the pious. One reads with edification but with a feeling how difficult it is to tread in their footsteps or rise to their level.'[84]

Like Johnson, Bunsen was a role model in shaping the moral universe of the young Frankland by identifying a specific source of vice in science: applied chemistry that focused on making money out of one's fundamental discoveries. It bears repeating that Frankland had already been taught during his childhood that avarice was to be avoided and moneymaking for its own sake was a moral danger; Bunsen built upon this earlier instruction by identifying specific temptations for chemists. Moreover, since 'Bunsen' was a model constructed in academic memory culture, these concerns with applied chemistry actually echoed contemporary concerns and attitudes of academic chemists, who, in the period of Frankland's ascent to prominence, sought to establish dominance over practicing applied chemists in debates over the nature of chemistry and the form of the discipline.[85]

Interestingly, both Frankland's early moral instruction and the more scientific teachings of later mentors pointed to the same solutions for the dangers of avarice and moneymaking: the performance and cultivation of virtuous habits, such as hard work, prudence and self-discipline. Seen in this light, there was no radical divide between Bunsen's advice to steer clear of applied chemistry and Thomas Day's parable of the two brothers; the one brother selfishly threw everything away in the pursuit of wealth, while the other was prudent, industrious and conscientious, and was therefore not plagued by greed.

There are two points that I can make on the basis of this exploration

83 Obituary of Robert Bunsen in the *Yearbook of the Royal Society*, written by Henry Enfield Roscoe, 1900 [HRP, JRL, 963, page 19].
84 William Turner Thiselton-Dyer to Henry Enfield Roscoe, 13 May 1900 [HRP, JRL, 963, page 23].
85 Bud and Roberts, *Science versus Practice*, chapters 5 and 6.

of the theme of avarice in Frankland's moral instruction. First of all, the instruction Frankland received illustrates the various mechanisms by which moral instructors sought to instil lasting virtuous habits in youngsters. Indirect moral instruction, like that provided by Thomas Day, conjured powerful images of good and evil in the world: avarice and moneymaking for its own sake are wrong but tempting, while unselfish devotion and prudence are right. Also, more direct forms of moral instruction, like Willasey's culturally mobile 'maxims of self governance', provided heuristic habits of thought for dealing with the self-threatening dangers that were so powerfully identified in Victorian moral instruction. Such virtuous habits needed to be cultivated from an early age in order for moral instruction to be effective, and should ideally be performed throughout one's lifetime.

Secondly, this exploration of avarice as a theme in Frankland's moral instruction has shed some light on the relationship between broad Victorian moral instruction and processes of academic socialisation. I have argued that the latter built upon moral attitudes cultivated in the former. Frankland learned how to deal with avarice and the temptation of moneymaking during early moral instruction, and subsequent teachers identified the sources of vice and temptation in a chemical life specifically.

Selfishness and the civilisation process

Underlying both the moral instruction in dealing with avarice and the distractive dangers of London was a powerful discourse stressing the dangers of selfishness to Victorian morality. Selfishness played a pivotal role in Frankland's moral instruction as a danger to individual morality and national progress. Many of his mentors and exemplars refer to selfishness and egotism as vices and warn Frankland of the dangers of being too preoccupied with himself. As such, an exploration of selfishness as a trope in Frankland's moral instruction might yield insight into hierarchies of vice and temptation in the Victorian moral imagination, as well as into

Victorian thinking on the nature of the self.[86]

Authors such as Samuel Smiles and Thomas Day believed that human nature was not necessarily corrupted, but that it was prone to all kinds of vicious influences and therefore needed guidance. A decent moral education in a virtuous environment was the only route through which such bad influences could be negated and the fragile progress of civilisation could be effected.[87] Selfishness, in this view, was an acquired vice, and an unselfish devotion to a higher cause, such as nation, faith or science (or all three at once) could likewise be cultivated if the moral environment was virtuous. It is not farfetched to see the 'love of science' that academic memory culture prescribed as remedy against vices as a variation on this theme of devotion.

Day's *Sandford and Merton* offers insight into how fragile this civilisation process could be, how influential the moral environment was, and how selfishness was imagined to be at the root of a plethora of other vices. When the main character of the book, the boy Tommy, took leave of the influence of his mentor Mr. Barlow and was left to his own devices in the midst of other wealthy and fashionable children, the reader could witness his moral degradation first hand. Influenced by the wrong people, Tommy betrayed all the virtues and habits he had been taught: 'all the common virtues of life, such as industry, economy, punctuality in discharging our obligations, or keeping our word' were all betrayed.[88] Instead, Tommy could 'indulge all his caprices; give way to all his passions; be humoursome,

86 For a discussion of how different traditions of thinking about nature impacted the Victorian discourse on character, see: Nathan Roberts, 'Character in the mind', 180-185.

87 Smiles drew upon older eighteenth-century traditions that stressed harmonious human nature and the power of the environment to shape human sensibilities, and therefore he stressed the importance of removing barriers to the development of the self: Travers, 'Samuel Smiles', 174-175. Likewise, Day was partially influenced by Rousseau's theories about the importance of an educational environment: Reinstein, *Alice in Context*, 20-23.

88 Day, *Sandford and Merton,* 49.

haughty, unjust, and selfish to the extreme.'[89]

The book, which described the moral instruction of young Tommy and the disciplining of his virtues and habits, thus shows what could happen if this education was abandoned too early: very soon, pride and selfishness would return as the governing passions, spurred on by bad examples.[90] On other occasions, pride is described as a passion 'most fatal in effect and apt to desolate the world'[91], and responsible for 'ridiculous prejudices' and 'foolish distinctions'.[92] Throughout *Sandford and Merton*, the vices of pride, egotism and selfishness were discussed repeatedly. They were responsible for a whole array of other vices, such as avarice, and were primarily the result of a lack of discipline and wrong influences. This shows that Day attached great importance to the continuous cultivation of virtuous habits; if the civilisation process was interrupted and such habits were forgotten, the result could be moral degradation.

Luckily, Tommy returned under the influence of his mentor Mr. Barlow and his virtuous friend Harry. To stress once more that the moral environment of a youngster was crucial to the development of virtuous habits, Day concluded his *Sandford and Merton* with a telling conversation, in which Tommy said to his mentor and friend: 'you have taught me how much better it is to be useful than rich or fine: how much more amiable to be good than to be great. Should I ever be tempted to relapse, even an instant, into any of my former habits, I will return hither for instruction.'[93] The goals of moral instruction, in Day's view, were not selfishness, greatness or accumulation of wealth, but goodness and usefulness; goals that benefited not the individual but the collective.

89 Ibid. 50.

90 Day was very much inspired by Rousseau's *Emile*, and likewise presented fashionable and wealthy youngsters as wrong influences: Reinstein, *Alice in Context*, 19-21.

91 Day, *Sandford and Merton,* 13.

92 Ibid. 206.

93 Ibid. 212.

Similar attitudes towards egotism, selfishness and pride are found in other pieces of moral instruction that Frankland received. It was present, first of all, in Johnson's letter, warning him of the distractions and dangers of London and modern agricultural chemistry and pushing him to cultivate habits of self-control. Likewise, Bunsen's example emphasised his unselfishness, as opposed to the vices of moneymaking. Both Johnson and Bunsen claimed that the pursuit of higher goals, such as fundamental chemistry, was an antidote to selfishness and egotism.

Another example of such higher goals in Frankland's moral instruction was a letter full of advice from the druggist Stephen Ross to whom Frankland was apprenticed during his teenage years in Lancaster, who wrote to Frankland in 1846:

> But in the pursuit of that knowledge which pertains only to this life and its concerns never forget nor neglect that knowledge which may be profitable unto life clerical – and the more your heart is influenced by this last the more quiet and unencumbered will your mind be and more equal to the exertion and selfdenial requested in looking to attain the former.[94]

This quote needs some unpacking. First of all, Ross introduced a second form of knowledge that he found more important than scientific knowledge: religious truth. For Ross, the pursuit of science should not lead to neglect or forgetfulness of religious duty and piety. Ross himself was an evangelical and was very active in the religious scene in Lancaster; his words of advice were very common in the Lancaster of Frankland's youth.[95]

Secondly, pursuing religious truth as one's priority would be beneficial to the pursuit of scientific knowledge, by cultivating the virtues needed for scientific discovery: exertion and self-denial. The role of religious piety, in Ross' reading of it, was to enable Frankland to pursue his

94 Stephen Ross to Edward Frankland, 10 January 1846 [EFP, JRL, 38/3473].
95 Russell, *Lancastrian Chemist*, 101. For evangelical attitudes towards science, see: Topham, 'Science and Popular Education', 429.

chemical career in the first place. The self-denial that was needed to pursue knowledge would only be guaranteed by surrendering to a higher truth. Again, selfishness and egotism were seen as both enemies of this higher religious truth, and as enemies of a safe pursuit of knowledge.

The pursuit of higher goals in Frankland's moral instruction, whether they were usefulness and goodness (in Day's view), the pursuit of scientific truth (in Johnson's and Bunsen's teaching), or religious piety (Ross's ideal), all depended on the selflessness of Frankland himself. Frankland needed to shed pride and egotism, and was encouraged to practice self-abnegation. As such, Frankland's moral instruction reflects broader Victorian ideals regarding 'heroism' and goodness. Mid-Victorian writing about heroism and goodness stressed a 'new' kind of heroism that stressed 'self-abnegation', 'self-effacement' and 'chivalry of spirit', rather than the former heroic ideals of militarism and physical courage.[96] Men, especially, could become 'heroic in the approved modern way, "the way of self-sacrifice"' in the service of a higher goal.[97] Selfishness and egotism were the natural villains of this new heroism.[98] Frankland's moral instruction here clearly parallels one of the remedies against vices that I brought up in the previous chapter: a love of science. Victorian academic memory culture gave examples of how rigorous self-discipline and the cultivation of a strong and continuous love of science could safeguard against vice.

Frankland's case also shows that moral instruction was perceived to be a competition between civilizational influences and degrading influences. As individuals, according to Smiles and Day, were very susceptible to their early educational environment, it was paramount that stable and enduring habits were cultivated in youngsters, and that the higher goals of instruction were kept in mind. If this process failed, as it almost did in Day's description

96 Merchant, '"Fresh Instruction"', 11, 17, 19. See also: Richard Bellon, *A Sincere and Teachable Heart. Self-Denying Virtue in British Intellectual Life, 1736-1859* (Leiden: Brill, 2015).

97 Ibid. 21.

98 Interestingly, self-abnegation and self-sacrifice became powerful topoi in epistemological discussions as well. See: Levine, *Dying to Know.*

of Tommy's relapse, selfishness and egotism would soon thwart the pursuit of higher goals.

Conclusion: mechanisms of moral instruction

At the beginning of this chapter, I queried where and how Victorian scholars learned to identify the vices that threatened their pursuits and where and how they learned to deal with them. The rich case of Frankland's moral instruction has provided insightful answers, with some consequences for how historians should perceive and approach the history of academic socialisation.

First of all, Frankland's moral instruction provided an answer to the first part of the question: *where* did Victorians and Edwardian learn the nature of the vices that threatened their scholarly selves, and where did they learn how to avoid those dangers? I have argued that at least in Frankland's case, he learned how to identify and deal with vices already during his childhood and teenage years. His parents, the books he read, his teachers Willasey, Ross and Johnson, all endeavoured to shape their son, reader or pupil into a good moral being. They saw it as their duty to inculcate good moral habits in the young Frankland, so that he learned to avoid temptation and vice. Such early moral education would enable Frankland to self-govern and self-help in adulthood. If the question is 'where did scholars learn how to deal with temptation and vice', then Frankland's case shows that they learned to do so in childhood homes, primary schools, and in institutions such as the Mechanics' Institute or occasional laboratories like that of the Johnson's in Lancaster.

The goal of shaping the attitudes and moral dispositions of youngsters with a view to preparing them for adult life was not unique to Frankland's case. Educationalists such as Willasey, Day and Smiles envisioned an early education to be the essential stage for moral instruction. If this childhood instruction was successful, the individual would be ready to stand the moral test of adult life. If this instruction would fail, however,

moral degradation, vice, and barbarism would be the inevitable result. This view of education was linked to a view of human nature that designated the period of childhood as the principal period of moral development in a person, and regarded human nature to be easily corrupted by evil influences. Being the right influence at the right moment in a child's development, therefore, was crucial. Education, then, was envisioned to be a civilising process, intended to counter vicious influences and, ultimately, to check the tide of barbarism and safeguard moral and national progress.

The second question I have posed was the issue of *how* Victorians such as Frankland learned to identify and deal with vices and temptations. In addition to the instructional role of academic memory culture, this chapter has identified three primary pedagogical mechanisms: the construction of powerful images of good and evil, the cultivation of stable and virtuous habits, and the education of desire. I will elaborate on all three separately, although moral educators employed them simultaneously.

To start with images of good and evil: Victorian educators sought to instil their pupils at an early age with very powerful images of virtue and vice. That is, at least, what Frankland's own teachers did. They did so indirectly, through children's literature or training in observation, but also directly, through moral advice and punishment of wrongdoing. In Frankland's case, a clear example of such an image was that of London as the metropolis of vice. All his educators and childhood influences communicated an image of London as the cesspool of temptation, where selfishness reigned. Another example was moneymaking for its own sake; this was continuously imagined to pose a threat to more elevated goals such as religion, science and national progress. Thomas Day's *Sandford and Merton*, Willasey's aphorisms, Johnson's warning of modern agricultural chemistry, all helped construct the view of moneymaking as a danger to virtuous pursuits. These images of virtue and vice drew their power from being embedded in broader Victorian currents of thought about character, self-help, and the nation, which also envisioned the individual and the

moral fabric of society to be under constant threat from vicious influences. At the same time, more specific forms of academic socialisation used the same mechanism to promote good scholarship: the exemplary lives and the vicious examples communicated in obituaries are a case in point.

Such images helped to identify vices and temptations, as well as the situations in which these dangers could threaten the self, but they did not teach how to avoid and withstand them. This role was reserved for a second mechanism: the transmission of virtuous habits of thought and action. *Sandford and Merton*, for example, not only presented a powerful image of avarice as a moral danger, it also provided the moral tools to avoid selfish greed: habits of prudence and hard work. Likewise, Frankland learned from Johnson that London was a danger, but also that laborious habits of constant note-taking and conscientious hard work could help him avoid the vices of the city. The transmission of such habits was meant to structure Frankland's actions, so that he could avoid temptations such as distraction, avarice and selfishness.

Frankland's teachers also sought to transmit moral habits of thought. Good examples are Willasey's aphorisms on conduct and Ross' advice to practice self-denial through habits of religious observation. Especially Willasey's 'maxims of self governance', as he would call them himself, are interesting units of moral instruction. The aphorisms he transmitted (and which Frankland transmitted to his own children) were fairly short, and therefore mnemonically robust: they were easily internalised and repeated. Moreover, they were culturally mobile and suited for many occasions; they were ideal *heuristics* for dealing with the complex problems of vice and temptation. As this suggests, they were powerful tools in Frankland's lifelong fight against vice. Whenever he recognised a dangerous situation, the internalised moral maxims of Willasey functioned as a *reminder* of his virtuous Lancaster education and the habits that he learned there. The peculiar persistence of such commonplaces, in Frankland's life and even in the next generation, shows how powerful these maxims were thought to be

and how easily they were cultivated and transmitted.

A final mechanism of moral instruction was the instilment of more elevated desires, which were to counter bad influences of others, selfishness and temptation. This becomes clear in the letter in which Ross warned Frankland not to forget the 'life clerical'. Ross cautioned Frankland not to forget his religious orientation, just as Johnson cautioned him to pursue scientific knowledge, and not to be distracted or led away by avarice, or like Bunsen, who taught Frankland that fundamental chemistry was the only goal worth pursuing.[99] Habits of thought and action were envisioned to be the tools that helped discipline those desires and much thus relied on the cultivation of the individual will. Again, the comparison with academic memory culture is striking, as one of the main remedies offered by writers of obituaries was the instilment of a love of science: a specification of such an elevated desire.

In his study of will in Victorian England, John Reed has shown that although there was a whole spectrum of opinions on the question of free will, 'recommended conduct was surprisingly uniform'.[100] From secular materialists to fatalists and Christian traditionalists, the recommended conduct was 'self-restraint in the service of some high cause', whether that was religious truth, science, or some conception of fate.[101] Frankland's case shows that Victorian moral educators sought to instil the importance of a higher cause already during childhood. Interestingly, also, this ties in with the points I have made in the previous chapter: at stake in Victorian and Edwardian thinking about character was not just virtues or vices, but also

99 For Frankland, the primacy of fundamental chemistry over applied chemistry was never in doubt. Although he did engage in the latter, he never forgot Bunsen's lessons that he should devote himself to the former and reminded himself and others of it repeatedly. See for example his inaugural address at Owens College, where he praised chemistry for 'its intrinsic excellence': Owens College, *Introductory lectures on the opening of Owens College, Manchester* (London: Longman, Brown, Green, and Longmans, 1852) 121.

100 John R. Reed, *Victorian Will* (Athens, OH: Ohio University Press, 1989) 402.

101 Ibid.

the intrinsic motivation to pursue science.

For moral instruction to fulfil its goal –the moulding of the morality of a child in order that it could withstand vices throughout adult life– the three mechanisms I have identified needed to be very effective and the effects needed to be long lasting; the images of virtue and vice, the virtuous habits, and the higher desires were to be ingrained into a child so comprehensively that it would be reminded of them throughout adult life. I would suggest that this also explains the commonplace *form* of these moral lessons. They were often phrased as what might seem obvious shorthands (work hard! Do not be distracted!) or short banal slogans (it is not what we eat, but what we digest that makes us strong), but their very brevity and cultural mobility is what made them easy to remember in situations of personal crisis.[102] It was precisely because of their pithiness and banality, that commonplaces served as constant reminders of the period of moral instruction during childhood and the civilisation process that children went through. If those lessons were forgotten during adulthood, the danger was very real that temptations and vices could again take over.

I would like to end my discussion of Edward Frankland's moral instruction by pointing out some of the consequences of these findings for other historians of the sciences and humanities. First of all, let me reiterate a point I have made throughout this chapter: processes of academic socialisation and more specific moral instruction at universities were built upon a more generic process of moral instruction taking place in childhood. It was during childhood that Victorians learned what vice and temptation were, how to recognise them and how to avoid them. This view was embedded in their conception of human nature and the various developmental stages they went through. Many of the attitudes traced by studies of academic socialisation (self-abnegation, patience, laboriousness, self-discipline) were already inculcated during a more generic process

102 For an analysis of proverbs in these terms, see: Shapin, 'Proverbial Economies'.

of childhood moral instruction. They reflected contemporary attitudes about the self, human nature, and moral progress. As such, historians of science and the humanities cannot ignore this process of socialisation into the governing values of ambient culture. University teachers and learned mentors capitalised on this ambient moral currency and built on the moral attitudes that their students had learned before they came under their influence.

This does not imply that universities and academic educators did not take their job of moral instruction seriously: they absolutely did. Virtuous habits, images of virtue and vice and the love of science required continuous upkeep. A learned life required constant vigilance and learned culture invested in the maintenance of morality, either through processes of socialisation, or through instructional genres like the obituary. Like Tommy from *Sandford and Merton* relapsed when his circumstances changed, so could scholars relapse when their circumstances changed. My point, then, is not that moral instruction exclusively took place before academic socialisation, but that academic socialisation could not be effective without this earlier process of moral instruction.

Secondly, historians of science and the humanities would do well to keep an open mind for the seemingly obvious banalities and moral commonplaces that structured the Victorian moral universe. Those moral slogans, I would argue, were performative in the sense that they were often repeated in various contexts, and, more importantly, shaped ideas, choices and actions. They were never mere platitudes, but rather always reflective of moral attitudes and lessons learned in the past. Moreover, as Steven Shapin has shown so admirably, commonplaces, aphorisms and proverbs play a powerful role in scientific practice up to this day.[103] Investigating the use of such moral shorthands in scientific practice, including an account of where and how a practitioner learned them and what they signified might enrich existing accounts of scientific practice and the values that govern it.

103 Ibid.

Finally, this chapter has shed some light on the very crucial question of what distinguishes scholarship from ambient society in general. Lorraine Daston, as mentioned earlier, describes the relationship between moral economies of science and general culture as follows: 'moral economies of science derive both their forms and their emotional force from the culture in which they are embedded'.[104] However, she adds, once moral economies of science have incorporated such broader cultural elements, 'they become naturalized to that milieu' and tend to reassert the boundary between science and 'ambient society'.[105] The findings that I have presented in this chapter support Daston's general observation that moral economies of science derive their power from ambient culture. The Victorian moral economy of science that pitted the morality of individual scholars against vice and required them to practice virtuous habits thus derived its force from the ambient Victorian language of virtue, vice and temptation. Nonetheless, as I have shown, Victorian scholars appropriated this language to suit their own concerns, contest scholarly debates and discipline the morality of their colleagues. By building on the ambient discourse of virtue and vice, teachers like Bunsen or Johnson identified dangers to scholarly pursuits specifically; they pitted applied chemistry against fundamental chemistry by referencing avarice and selfishness as dangers belonging to the former. At the same time, by emphasising their unique status as disinterested and virtuous seekers of truth, Victorian scholars distanced themselves from the very society that provided the language and structures to describe themselves as such in the first place.

The first two chapters of this dissertation have dealt with what I have called 'common ground': a broad agreement about the moral nature of scientific pursuits and the idea that the scholarly self was constantly threatened by vice. In chapter 1, I sketched the outlines of this common ground and argued that six dangers were threatening Victorian and Edwardian science, and that two remedies were advised. I also stated that

104 Daston, 'The Moral Economy of Science', 24.
105 Ibid.

obituary writers instructed in these matters: they communicated powerful images of vice and its remedies. This second chapter has shown how this common ground was constructed on the basis of broader traditions of moral instruction. Ambient culture provided the language and cultural mechanisms for scholarly culture to use and appropriate. Also, this chapter has shown how individuals negotiated ideals of scientific selfhood and how they learned to inhabit these in the first place.

The following two chapters of this dissertation will focus not on common ideals about what it took to be a scholar, but on conflict. Where there was a general agreement about the moral nature of science and the constant threat of vice, there was no agreement about what good science actually was. If we shift our vision away from remembrance and instruction, and focus instead on controversy and cooperation, we can see that the common tongue that the language of vice provided was also a powerful weapon in heated discussions about scholarship. Just because the category of vice was perceived to be so dangerous by all, it became paramount to fight the vices in others.