

The Paper Trade in Early Modern Europe

Practices, Materials, Networks

Edited by

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Contents

Preface IX
Daniel Bellingradt and Anna Reynolds

List of Illustrations X

Notes on Contributors XVII

- 1 The Paper Trade in Early Modern Europe: An Introduction 1
Daniel Bellingradt

PART 1

Hotspots and Trade Routes

- 2 Selling Paper in Early Modern Venice: Paper-retailers and the “Libri da carta bianca” 31
Anna Gialdini
- 3 ‘Unter dem Zeichen des Adlers’: Frankfurt as Hub of the Central European Paper Trade in the 16th Century 55
Megan K. Williams
- 4 The Paper Supply of a Printing House as a Mirror of the Paper Trade in the Early Modern Low Countries: The Case of Dirk Martens’ Workshop 90
Renaud Adam
- 5 Juan Tomás Favario and the Paper Trade in Early Modern Spain or the Supply of Paper as a New Modality of Publishing 106
Benito Rial Costas
- 6 Paper Flows through the Danish Sound, 1634–1857 125
Jan Willem Veluwenkamp
- 7 Networks of Paper in Late Medieval England 148
Orietta Da Rold

PART 2***Usual Dealings***

- 8 Types and Sources of Paper in Late Medieval Finland: A Case Study of the Paper in Raseborg Castle Scriptorium, ca. 1390–1435 169
Tapio Salminen
- 9 Buying Paper for the Consulate: Insights into the Paper Trade of Lyon, 1450–1525 197
Jean-Benoît Krumenacker
- 10 The Usage and Acquisition of Paper in the Jagiellonian Courts, 1490–1507 218
Krisztina Rábai
- 11 The Paper Purchases of the Dutch East India Company's Amsterdam Chamber in the Early Eighteenth Century 244
Frank Birkenholz
- 12 Stationers, *Papetiers* and the Supply Networks of a Swiss Publisher: The Société Typographique de Neuchâtel and the Paper Trade 1769–1789 266
Simon Burrows, Michael Falk, Rachel Hendery, and Katherine McDonough
- 13 The Paper Trails of Guðbrandur Þorláksson: A Case Study of the Official and Private Paths Used for Purchasing Paper by the Sixteenth-Century Bishop of Hólar, Iceland 302
Silvia Hufnagel

PART 3***Recycling Economies***

- 14 Material Sensibilities: Writing Paper and Chemistry in the Netherlands and Beyond, ca. 1800 327
Andreas Weber
- 15 “Worthy to Be Reserved”: Bookbindings and the Waste Paper Trade in Early Modern England and Scotland 342
Anna Reynolds

PART 4

Epilogue

16 Afterword 371
Helen Smith

Index of Names and Subjects 381

Material Sensibilities: Writing Paper and Chemistry in the Netherlands and Beyond, ca. 1800

Andreas Weber

1 Introduction¹

In the late eighteenth century, producers of writing paper in the Netherlands lived in a world full of material sensibilities. On the one hand, they profited from the heavy consumption of writing paper by capitalising on their reputation of being able to supply customers all over the world with large quantities of writing paper.² On the other hand, Dutch papermakers continuously feared that writers would prefer a paper which was a bit heavier, a bit whiter, or which had a slightly different shade or texture to the paper that they produced. Coping with such paper-related material sensibilities was a key challenge for paper producers not only in the Netherlands, but also in other parts of the world. By demonstrating that papermakers were keenly aware that paper used for communicative purposes needed to possess a specific materiality, this chapter conceptualises material sensibilities. It focuses, in particular, on how paper-related chemical expertise entered the realm of paper mills in the late eighteenth century. In doing so, this chapter explores a neglected perspective of the early modern paper trade: namely a different and additional material story of the commodity, a story in which the product “paper” is deeply related

1 The research for this paper has been carried out as part of the NWO project Chemistry in Everyday Life (2011–2015), grant number: 360-51-100 directed by prof. Lissa Roberts (University of Twente). I also thank Henk Pork, former paper curator at the Royal Library in The Hague, and Bas van Velzen, University of Amsterdam, for longer conversations on the topic.

2 In the late eighteenth century in particular Dutch writing paper was an export product which was consumed not only in Europe but also in the Americas, the Levant and Asia. For general overviews of the Dutch paper producing industry, see: Bram Bouwens, ‘The paper and board industry in the Netherlands, 1800–2000’, in Juha-Antti Lamberg, etc. (eds.), *The evolution of global paper industry 1800–2050* (Dordrecht: Springer, 2012), pp. 191–209; Dick van Lente, ‘Innovation in paper making. The Netherlands 1750–1850’, *History and Technology*, 14 (1998), pp. 201–224 and the many publications by Henk Voorn, former paper conservator at the Koninklijk Bibliotheek in The Hague.

to the surrounding society and the use of and demand for certain papers.³ Also, this chapter deals with the typical and newly evolving patterns and practices of producing paper in a recycling modus. In particular the second part of this essay shows how chemists – perhaps unexpected actants in the networks of the paper trade – capitalised on material sensibilities in Dutch society by praising the value of alternative raw materials, recycling, and new bleaching techniques.⁴ Taken as a whole my chapter argues that in the late eighteenth century, writing paper was a chemically complex product, and that its production never followed a simple market logic.

Historical attempts to tinker with chemical expertise in the context of the production of paper have also caught the attention of other historians interested in the history of paper. While some consider such experimenting as an inevitable step towards a modern wood-pulp-based paper industry, others have seen them as short-lived experiments by failed entrepreneurs who lacked proper chemical and botanical expertise.⁵ Others have interpreted such experiments as a reaction to local and temporary shortages of linen rags, the main material for the production of paper, and to the introduction of new paper-making machines which required different raw materials.⁶ However, owing to the relative stability of prices for linen rags in the Netherlands in the decades around 1800, one may doubt whether scarcity triggered chemical tinkering and technological change.⁷ Even during the Napoleonic wars, enough

3 For an excellent overview of the paper trade in the late eighteenth century Netherlands, see: Daniel Bellingradt, *Vernetzte Papiermärkte. Einblicke in den Amsterdamer Handel mit Papier im 18. Jahrhundert* (Cologne: Herbert von Halem Verlag, 2019).

4 For a fascinating view on the role of chemists and their expertise in Dutch society in the late eighteenth century, see the unpublished PhD dissertation by J. van Driel, *The filthy and the fat. Oeconomy, chemistry, and resource management in the Age of Revolutions, 1700–1850* (Twente: unpublished PhD thesis University of Twente, 2016). For a more general view on this topic see: Simon Werrett, *Thrifty Science. Making the most of materials in the history of experiment* (Chicago, Ill.: The University of Chicago Press, 2019).

5 Gary B. Magee, 'Competence or Omniscience? Assessing entrepreneurship in the Victorian and Edwardian British paper industry', *Business History Review*, 71:2 (1997), pp. 230–259 and Günter Bayerl, *Die Papiermühle. Vorindustrielle Papiermacherei auf dem Gebiet des alten deutschen Reiches. Technologie, Arbeitsverhältnisse, Umwelt* (2 vols., Frankfurt a.M.: Peter Lang, 1987), 1. 379–397.

6 Gabriëlle Beentjes, and Henk Porck, 'De zoektocht van Jacob Christian Schäffer. Wit, vezelig en ruim voorhanden ...', *Puur papier*, 6 (2008), pp. 4–17; Benjamin W. de Vries, *De Nederlandse Papiernijverheid in de negentiende eeuw* (The Hague: Nijhoff, 1957), pp. 260–303; Judith A. McGaw, *Most wonderful machine. Mechanization and social change in Berkshire paper making, 1801–1885* (Princeton, N.J.: Princeton University Press, 1992), p. 196.

7 For detailed studies on the functioning of the rag trade in the neighboring Germany see Johannes Laufer, 'Knappe Ressourcen als Barriere und Triebkraft innovativer Entwicklung. Zur Bedeutung von Lumpen, Holz und Wasser in der niedersächsischen Papierindustrie

textiles were collected in the Netherlands or entered the Netherlands along the Rhine river, sometimes legally, and sometimes aided by smugglers and local merchants in border regions.⁸ Instead of taking the scarcity of raw materials or technological change as an analytical point of departure, this chapter studies papermakers' and chemists' responses to changes in fashion and the taste of Europe's literate elite. By doing so, it nuances the history of a product which played a key role in wider transformations of material and knowledge exchange, sociability, and identity formation in the late eighteenth and early nineteenth centuries.

This essay contributes to emerging scholarship on the materiality of paper. Over the last decade various historians of paper, have emphasized that it is not only important to study what is written on paper, but also to look closely at the physical qualities of paper.⁹ For institutions such the *Vereenigde Oostindische Compagnie* (Dutch East India Company, VOC), or the Dutch parliament, established in 1795, paper was more than simply a costly product.¹⁰ Next to content, readers also checked whether writers had used paper of an appropriate shade, weight, texture, thickness, evenness, graining, and size. In 2010, Leonard Rosenband reminds us that, in the late eighteenth century, writers usually "rubbed the paper between their fingers and lifted it up to the light for a clear look at its knit and blemishes"¹¹ before they bought and used a paper for their correspondence. Moreover, they had developed a rich vocabulary to talk about

(19./20. Jahrhundert)', *Niedersächsisches Jahrbuch für Landesgeschichte*, 80 (2008), pp. 215–240 and Bayerl, *Die Papiermühle*, 1. 370–379.

- 8 For an in-depth view on the linen industry and trade in Europe see: Leslie A. Clarkson, 'The Linen Industry in Early Modern Europe,' in David Jenkins (ed.), *The Cambridge History of Western Textiles* (2 vols., Cambridge: Cambridge University Press, 2003), 1. 473–492.
- 9 See Matthew Hull, 'Documents and Bureaucracy', *The Annual Review of Anthropology*, 41 (2012), pp. 251–267; Ben Kafka, 'Paperwork. The State of the Discipline', *Book History*, 12:1 (2009), pp. 340–353 and Anke te Heesen, 'The Notebook. A Paper Technology', in Bruno Latour, and Peter Weibel (eds.), *Making things public: Atmospheres of democracy* (Cambridge: MIT Press, 2005), pp. 582–589. For a more general plea to study everyday materials such as paper from a history of chemistry perspective see: Lissa Roberts, and Simon Werrett (eds.), *Compound histories. Materials, governance, and production, 1760–1840* (Leiden: Brill, 2018).
- 10 The Dutch National Assembly consumed almost 175,000 sheets of writing papers on average per year. For exact numbers, see: National Archive The Hague, *Wetgevende colleges, 1796–1810*, inv. 498–500. On the consumption of paper by the VOC, see Henk Voorn, *Het papier in voormalig Nederlands Oost-Indie. Een historisch-bibliografische studie* (Leiden: Papierwereld, 1978) and the chapter by Frank Birkenholz in this volume.
- 11 Leonard N. Rosenband, 'The Many Transitions of Ebenezer Stedman. A Biographical and Cross-National Approach to the Industrial Revolution', in Jeff Horn, Leonard N. Rosenband, and Merritt Roe Smith (eds.), *Reconceptualizing the Industrial Revolution* (Cambridge, MA: MIT Press, 2010), pp. 201–228, here: p. 205. For North America see:

paper.¹² An engraving by the Dutch draftsman and landscape painter Cornelis van Noorde (1731–1795) is one of the small number of images that demonstrates how the material properties of paper mattered to consumers (see fig. 14.1). In this image, Van Noorde depicts a paper or bookshop in the Netherlands in which a buyer critically examines a sheet of paper by holding it against the light. The customer's inspection of the paper is characteristic of a world full of material sensibilities in which the choice of the paper determined how the *content* of a handwritten letter or printed book was perceived by the reader.¹³

This chapter is split into two sections. The first section explains how writing paper was produced. Moreover, this chapter introduces and discusses a relatively unknown historical account of the Dutch paper trade from 1781. The account which is now stored in the municipal archive in Zaanstad highlights that writers looked carefully *at* paper before they decided which sheets to buy. The second part of the chapter examines how chemists capitalised on paper-related material sensibilities in Dutch society.¹⁴ Chemists interested in papermaking considered material sensibilities an ideal occasion to offer their expertise in the form of publishing texts and practical advice aimed at improving manufacturing processes. Inspired by developments in neighbouring German speaking areas, the Amsterdam chemist-apothecaries promoted chemical expertise as a tool to produce new and improved sorts of writing paper.¹⁵ Chemical expertise could not only be used to recycle old paper, or to experiment with deinking techniques on misprinted paper, it could also be used to improve the use of alternative plant fibres for the production of writing paper. Although many of the suggestions made by chemists were never fully implemented in practice, my analysis sheds new light on the material complexities entailed in the production of paper.

Konstantin Dierks, 'Letter Writing, Stationary Supplies, and Consumer Modernity in the Eighteenth-Century Atlantic World', *Early American Literature*, 41:3 (2006), pp. 473–494.

- 12 For the rich vocabulary writers used to judge writing paper, see: Petrus Josephus Boonekamp, *Handleiding tot de schrijfkunst. Naar vaste regelen, met aanwijzing van de meest in het oogvallende afwijkingen* (Leiden: Mortier, 1830), pp. 54–75.
- 13 This point is valid for the period pre-1800. See Heather Wolfe, 'Letter Writing and Paper Connoisseurship in Elite Households in Early Modern England', in Carla Bittel, Elaine Leong, and Christine van Oertzen (eds.), *Working with paper. Gendered practices in the history of knowledge* (Pittsburgh, PA: University of Pittsburgh Press, 2019), pp. 17–31.
- 14 For a more general view on this topic see: Werrett, *Thrifty Science*.
- 15 P.T. Schonck and P.J. Kasteleyn, 'Tweede antwoord op de vraag ...', *Verhandelingen van het Provinciaal Utrechtsch Genootschap van Kunsten en Wetenschappen*, 4 (1786), pp. 108–188, here: pp. 176–177.

2 Material Sensibilities and Writing Paper

In 1781, an unknown author penned the *Memorie der Papier-Negotie naer Experientie, a. 1781* (“Account of the paper trade according to experience, a. 1781”). This relatively unknown text offers a valuable glimpse into the material sensibilities of late eighteenth- and early nineteenth-century paper consumers. The author’s deep insight into the daily practices and functioning of the paper trade in the Netherlands and beyond suggests that the writer was a very experienced trader, probably based in Amsterdam.¹⁶ In the handwritten account, which totals fifteen pages, the author lists major producers of paper, names large-scale traders, and explains which papers customers could buy and in which shops they were for sale. The most important sorts, according to the author, were writing paper, printing paper, blue paper, wrapping paper and cardboard, and the specific material properties of each of these papers are described in close detail. In order to demonstrate the rich variety from which consumers had to choose, I will focus in detail on writing paper, one of the most competitively traded products in the late eighteenth- and early nineteenth-century paper trade.

Writing paper was produced in three areas of the Netherlands: the Zaan area, close to Amsterdam, the Veluwe area, and Limburg. In the decades around 1800, there were ca. 60–80 paper mills producing writing paper in the Netherlands. Mills in the Zaan area produced the finest writing paper, and mills in the Veluwe and Limburg produced, according to the author of the account, paper of lesser quality. It has been estimated that paper mills in the Zaan area alone produced ca. 100,000 reams (= 50 million individual sheets) of writing paper on an annual basis in these years.¹⁷

As with printing paper, the production of writing paper was a complex process.¹⁸ The most important raw materials for writing paper were old textiles made of linen and cotton, and sometimes also snippets of old paper.¹⁹

16 The account gives details as to how and when specific paper makers can be best contacted.

17 For this number, see: de Vries, *De Nederlandse Papiernijverheid*, p. 103. For a panoramic overview of the history of paper production in the Netherlands see: Henk Voorn, *De geschiedenis der Nederlandse papierindustrie* (3 vols., Haarlem: Papierwereld, 1960–1985).

18 For the best in-depth view on technical aspects of the production of Dutch writing paper see: Ellen van der Grijn, and Adriaan Kardinaal, *Technische ontwikkelingen in de Nederlandse papierproductie in de eerste helft van de 19^e eeuw* (Amsterdam: unpublished paper, 2003), pp. 45–78.

19 See for the trade of snippets used in paper production the thesis project of Sandra Zawrel from the University of Erfurt.



FIGURE 14.1 Depiction of a paper or book shop. The illustration is made by Cornelis van Noorde probably in the 1760s. See also: <http://hdl.handle.net/10934/RM0001.collect.163650>

Usually the textiles were collected in cities and the countryside by private individuals and small companies,²⁰ Paper mills often stored several tons of linen

20 For an empirically rich study which focusses on the collection of rags in Edinburgh see: Claire Louise Friend, *The social life of paper in Edinburgh c. 1770–c. 1820* (Edinburgh: unpublished PhD thesis University of Edinburgh, 2016), online version: <http://hdl.handle.net/1842/23513> (last accessed 28 April 2020). For a more general history of recycling see: Susan Strasser, *Waste and want. A social history of trash* (New York, NY: Metropolitan Books, 1999).



FIGURE 14.2 A ream of paper as it was delivered to customers
IMAGE COURTESY OF KONINKLIJKE BIBLIOTHEEK, DEN HAAG

rag²¹ After the rags had arrived at the paper mill, they were washed, sorted according to colour, fibre, and quality, and cut into smaller pieces. This work was poorly paid and often dangerous. Since textiles were rarely cleaned before they reached the paper mills, the health of workers was threatened by poor air quality and germs. The next step was to wash the rags in water and open up the fibre with a machine called a ‘Holland beater’. Later the water was removed, and the pulp was dried and moved into a reservoir. When there was no wind, the pulp was poured into a huge barrel containing warm water. In order to produce a sheet of paper the vatmen dipped a wooden mould in the vat and sieved the pulp out of the water. The paper was then put on a felt and pressed. After it had been dried in a huge shed, writing paper – unlike printing paper – was sized with a layer of gelatine (made of animal bones and skins), which prevented writing ink from bleeding. Writing paper eventually reached booksellers, printers and government officials in reams (see fig. 14.2), made up of either 500 or 480 sheets of paper.²²

21 For exact numbers, see the inventory of the paper mill *De Bonsem*: GA Zaanstad, collectie PA 451 Honig, Notitie van vaste en andere goederen behoorende tot de gedissolveerde Compagnie Papier Fabriek en Negotie, 1 Maart 1774.

22 For different packaging units see: Daniel Bellingradt, ‘Trading Paper in Early Modern Europe. On Distribution Logistics, Trader, and Trade Volumes between Amsterdam

The trade of paper was a global endeavour. In particular in the Zaan area, owners of paper mills were often also involved in the shipping business. Adriaan Rogge (1732–1806), for instance, was a merchant and one of the biggest producers of writing paper in the Zaan area.²³ Born into a Mennonite family who were involved in the production and trade of rope, ships, and wood, Rogge owned several larger ships which he used for the export of paper.²⁴

The writing paper which was produced at his paper mills (*De Wabvis* and *De Kruyskerk*) in the Zaan area was sold in large quantities to domestic customers such as the Dutch parliament.²⁵ Rogge's writing papers were also shipped to the West Indies, Russia, Italy, Spain, the Levant, and the Americas. On their way back the ships brought tobacco, coffee, sugar, wood, cacao, hemp, and other products to the Netherlands.²⁶ Rogge was not unique in the Zaan area. Many other papermakers were also involved in shipbuilding and global commerce.

However, on the opening page of the *Papier-Negotie*, the author states that it is not the *price* but the sheer *variety* of different sorts of paper that is the most notable characteristic of the paper trade. Although many varieties were already in existence, there was a continuous need to develop new sorts of paper. The author of the account argues that the ability to develop and trade in the rapidly growing varieties of paper, each with different material properties, was a decisive factor in the commercial success of the Dutch paper producers in the late eighteenth century.²⁷ It is therefore not surprising that the author of the account discusses the properties of the writing papers of different producers. The author claims that producers such as Adriaan Rogge, Jan Kool, and others offered writing papers which were of finer and better materials.

and Hamburg in the Mid-Late Eighteenth Century', *Jaarboek voor Nederlandse Boekgeschiedenis*, 21 (2014), pp. 117–131.

23 GA Zaanstad, collectie PA 451 Honig, Memorie der Papier-Negotie, p. 2.

24 Rogge owned (sometimes partially), the following ships: Maria Margaretha, Mattheaus, Triton, Vrouw Hillegonda, De Stad Haarlem, Juffrouw Maria, Sint Agatha, and ca. five more.

J. Rogge, *Het geslacht Rogge te Zaandam. Drie eeuwen familiegeschiedenis tegen den achtergrond van nering en bedrijf* (Koog a.d. Zaan: Out, 1948), p. 115.

25 Rogge was one of the paper suppliers of *De Nationale Vergadering* established in 1795.

26 For the best insight in Rogge's trading network see: Rogge, *Het geslacht Rogge te Zaandam*, p. 47 and pp. 117–128.

27 GA Zaanstad, collectie PA 451 Honig, Memorie der Papier-Negotie naar experientie, A° 1781, p. 1: "De Papier Negotie op zich zelve, geen uitgestrekte nog zeer speculeuze handel, ten apparentie en uitzicht van merkelijk gewin zijnde; Maar doorgaans in gewoone Consumptie, dagelijkse Clandizie en Enkele buiten Commissien bestaande; – ook geen merkelijke variatie in de Cours der prijzen onderhevig; – In zeer veele en onderscheidene Aart en Sorteering, min of meer bestaande; – Van Welke men Echter altoos, pro rato, best mogelijk diend voorzien te zijn."

They were much smoother than writing papers from mills in other parts of the Netherlands. In particular the writing paper from the Veluwe, another paper-making region in the Netherlands, had the same whiteness, but was woollier and had a rougher texture. This meant that the ink bled through the paper, making it more difficult to write on.²⁸ Less successful was a manufacturer from Egmont, close to the North Sea, who produced a heavy and very flat paper which eventually turned yellow; and it was because of the yellowish tone of the paper, as the trader put it, that more and more writers and printers chose to purchase other papers.²⁹ Writers evidently cared deeply about the physical properties of the paper they used, particularly its whiteness and the smoothness of its surface and texture. Paper producers, therefore, had to negotiate survival in a market determined by material sensibilities, in which writers cared deeply about the texture and whiteness of the paper they used.³⁰

This section shows that in the late eighteenth and early nineteenth centuries, Dutch papermakers had to deal with a number of opportunities and constraints. On the one hand, they could rely on well-established products such writing paper and blue wrapping paper which found domestic and international buyers. On the other hand, papermakers continuously feared that consumers would choose to write their letters on a paper which looked and felt a bit different than to theirs, and that was produced by one of their competitors. Of course, this anxiety did not remain unnoticed in Dutch society. When the unknown author of the *Papiernegotie* penned his insights about the paper-related sensibilities of paper consumers in 1781, new ideas about the position of chemistry in society were being voiced in the Netherlands. Inspired by the establishment of special chemical institutes for manufacturers in neighbouring German speaking countries, in particular Amsterdam, chemist-apothecaries called for the appointment of public lecturers for chemistry in all major Dutch cities. These lecturers, it was hoped, would introduce

28 GA Zaanstad, collectie PA 451 Honig, *Memorie der Papier-Negotie*, p. 3: "In 't Algemeen zijn de Noordhollandsche beter in soort, dan de Geldersche, en daarom meer begeerd en gebruikt werdende; De Noord holl: fijner en beter van Stoff, en gladder van verf zijn, beter en zuiverder te beschrijven dan de Gelderse; die doorgaans wel zo blank, doch wolliger en grofver zijn, moeilijker in het beschrijven en veel al doorvloeiende zijn."

29 GA Zaanstad, collectie PA 451 Honig, *Memorie der Papier-Negotie*, p. 3. The name of the producer is L. Gerrevink. The author of the account describes his writing papers as: "van ouds vermaard, voor zwaar en zeer glad Papier, – Doch zeer geel vallende; allangs minder geprefereerd of begeerd wordende."

30 For the importance of 'whiteness' in paper making: Peter Bower, 'The disastrous history of paper', in Jane Eagan (ed.), *IPC Conference Papers London 1997. Proceedings of the Fourth International Conference of The Institute of Paper Conservation 6–9 april 1997* (Worcester: The Institute of Paper Conservation, 1998), pp. 1–14.

manufacturers to basic chemical practices in order to improve their production processes.³¹ In the late eighteenth century, Amsterdam was home to a dynamic community of merchants, manufacturers of chemicals, and apothecaries that provided a fertile ground for chemical tinkering and education.³² In the following section I use chemical treatises published by the Amsterdam chemist-apothecary Petrus Johannes Kasteleyn, as well as archival documents related to experimentation with new bleaching techniques, as a means to better understand how chemists capitalised on the anxieties of paper producers in the late eighteenth century.³³

3 Chemistry and Material Sensibilities

A first insight into how chemists responded to paper-related material sensibilities in Dutch society is offered by the Dutch translation of Jérôme de la Lande's famous papermaking manual *Art de faire le papier* ("The art of producing paper"), published in French in 1761.³⁴ The Dutch translation was produced by the Amsterdam chemist Petrus Johannes Kasteleyn and came off the presses in Dordrecht in 1792.³⁵ According to Kasteleyn, the application of chemistry could help papermakers in a number of ways: first of all chemicals could be used to clean dirty rags before they entered the production process.³⁶ Secondly, chemistry could be used to improve the filtering of water, a crucial factor in the production of good quality, white paper. Water which had been polluted with salt or other impurities had an impact on the colour of paper.³⁷ Kasteleyn based his comments not only on his survey of literature on paper making from French and German speaking areas, but also on extensive conversation with the paper producers in the important papermaking Zaan area.³⁸

31 For a good overview of the situation in Germany see: Ursula Klein, 'Apothecary's Shops, Laboratories and Chemical Manufacture in Eighteenth-Century Germany', in Lissa Roberts, Simon Schaffer, and Peter Dear (eds.) *The mindful hand. Inquiry and invention from the late Renaissance to early industrialisation* (Amsterdam: Edita KNAW, 2007), pp. 247–276.

32 Andreas Weber, *Hybrid Ambitions. Science, governance, and empire in the career of Caspar G.C. Reinwardt* (Leiden: Leiden University press, 2012), chapter 1.

33 On Kasteleyn see: L. Roberts, 'P.J. Kasteleyn and the "Oeconomics" of Dutch Chemistry', *Ambix*, 53:3 (2006), pp. 255–272.

34 Joseph Jérôme Le Français de Lalande, *Art de faire le papier* (Paris: Saillant, 1761).

35 Petrus Johannes Kasteleyn, *De papiermaker* (Dordrecht: A. Blussé en Zoon, 1792).

36 Kasteleyn, *De papiermaker*, p. 13 footnote 7.

37 Kasteleyn, *De papiermaker*, p. 13 footnote 32–33.

38 Kasteleyn, *De papiermaker*, title page.

In the first of the three lengthy appendices he added to De La Lande's text, Kasteleyn details how chemical expertise could be used to produce papers with different grades of whiteness and smoothness. In addition to the chemical interventions mentioned above, Kasteleyn argued that chemistry would also allow papermakers to replace linen rags with alternative plant fibres. If treated with chalk and exposed to sufficient humidity, Kasteleyn claimed, thistles and mugwort could serve as an ideal raw material for white sheets of writing paper. Whiteness could also be achieved through the recycling of misprints and new deinking techniques which relied on recent chemical discoveries. The work of Justus Claproth (1728–1805) had shown that chemical expertise could help to overcome a major challenge, namely the proper deinking of misprinted sheets of paper. In a relatively short treatise Claproth had, according to Kasteleyn, demonstrated and explained how Fuller's earth (in German: *Walke* or *Wascherde*) could be used to remove the ink from paper. Since Claproth's treatise was printed on recycled paper, the efficiency and applicability of the method had been convincingly proven.³⁹ Instead of using misprints only for the production of wrapping paper, Kasteleyn considered it as important raw material for fine writing paper.⁴⁰ Book sellers and printers regularly sold misprints and other waste papers to paper makers.⁴¹

However, owing to the famous secrecy of Dutch paper makers, it is difficult to reconstruct the extent to which paper makers acted on Kasteleyn's suggestions. The already mentioned Adriaan Rogge, who was one of the biggest paper producers in late eighteenth-century Netherlands, constantly reminded his fellow countrymen to remain silent about precise production procedures in paper mills. It is therefore not surprising that detailed reports by papermakers about their production methods and attempts to improve these are scarce. Moreover, since paper is a chemically complex product, one can also assume that many paper makers already possessed a thorough chemical expertise even without the intervention of Kasteleyn and his fellow chemists. Much more research into archival materials would be necessary to study the historical relationship between chemical expertise and the production of paper in the late eighteenth century in the Netherlands. However, my own empirical research suggests that Kasteleyn's call did not remain entirely unheard. An episode in which one of

39 On Claproth see: Günther Bayerl, 'Die Suche nach neuen Rohstoffen in der Papiermacherei des 18. Jahrhunderts', in *Die Erfindung des Papierrecycling. Zur Rolle der ehemaligen Papiermühle Klein Lengden bei der Rohstoffrückgewinnung* (Gleichen: Förderverein Historische Spinnerei Gartetal, 1996), pp. 5–23.

40 Kasteleyn, *De papiermaker*, p. 207.

41 See for this point the contribution of Anna Reynolds in this volume on waste paper in England in the sixteenth and seventeenth centuries.



FIGURE 14.3 View of a typical chemical work place in Amsterdam, ca. 1800

IMAGE COURTESY OF STADSARCHIEF AMSTERDAM, 010097016865

Kastelyn's colleagues from Amsterdam helped papermakers in the Zaan area to experiment with new bleaching techniques shows that collaborations among chemist-apothecaries and papermakers were not uncommon. The empirical evidence of this case can be found in the Noordhollands Archive in Haarlem in the company archives of Van Gelder Papier. The company's archive contains historical records which date back to the late eighteenth and early nineteenth centuries.⁴²

The experiment began in 1812, when six producers of writing paper in the Zaan area asked the Amsterdam chemist-apothecary Philips to help them to produce bleaching substances (*acidium muriaticum* and *acidium sulphuratum*) in a shed close to a paper mill.⁴³

42 For notes on bleaching experiments, see Noord-Hollands Archief, Haarlem, 457 Van Gelder, inv. 1108.

43 Here are the full names of all involved paper makers: Van Gelder, Jan van Vleuten, J. Honig & Zonen, Jan Kool, Breet, Blauw & Briel.

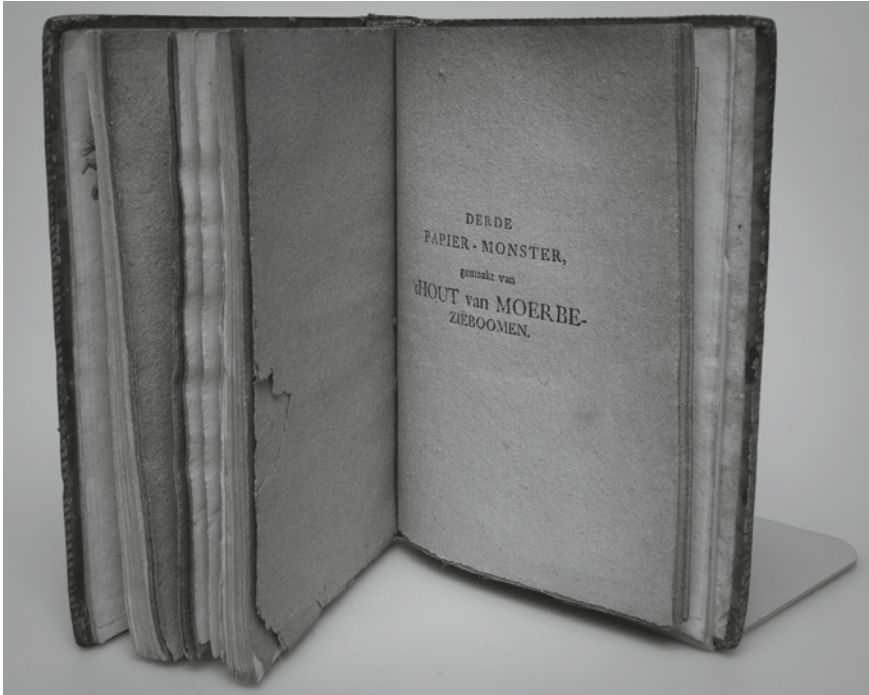


FIGURE 14.4 Paper made of the wood of mulberry trees which were grown in Southern Europe, the West Indies and other colonial areas. According to the Amsterdam chemist-apothecary Kasteleyn mulberry wood allowed paper makers to produce white writing paper. The mulberry paper depicted here can be found in: J.C. Schäffer, *Proefnemingen en monsterbladen om papier te maaken zonder lompen* (Amsterdam: J.C. Sepp, 1770), vol. 2

IMAGE COURTESY OF KONINKLIJKE BIBLIOTHEEK, DEN HAAG

Papermakers aimed to use muriatic and sulphuric acid to bleach linen rags once they had arrived at the paper mill. The papermakers hoped that the application of muriatic, which was made of sea salt, and sulphuric acid, made of sulphur, would enable them to produce a white, flat, and durable paper which could be used for bank notes.⁴⁴ Philips, who ran a small workshop in the Warmoesstraat in Amsterdam, was skilled in producing chemicals on a large scale for manufacturers such as the papermakers in the Zaan area.⁴⁵ In his

44 On the production of bank notes see also: Andreas Weber, 'Renegotiating Debt. Chemical Governance and Money in the Early Nineteenth-Century Dutch Empire', in Roberts, Werrett, *Compound Histories*, pp. 205–225.

45 The workshop is mentioned here: *Affiches, annonces et avis divers d'Amsterdam*, 11 July 1812, also available online: <https://resolver.kb.nl/resolve?urn=ddd:010196417:mpeg21:a0069>.

own workshop, Philips processed and produced different chemicals for industrial purposes in Amsterdam and neighbouring areas.⁴⁶ The production and eventual application of the acids was supposed to take place in 1812 in a barn next to one of the paper mills in the Zaan area, where a new chemical workshop was built. The chemical workplace was equipped with a large stone furnace, distilling equipment, iron kettles, many vats for storing and mixing substances, bleaching tubs, glasswork such as funnels, jars made of stone, and hydrometers which enabled chemists to test the quality of the final product as well as the raw materials.⁴⁷ Moreover, the papermakers had acquired all necessary raw materials, such as unprocessed muriatic acid, kitchen salt, saltpeter acid, ash, indigo, chalk, a substantial amount of rain water, incense, black manganese, coal and linseed oil. However, despite all preparations the chemical workplace was never used. When one of the papermakers reminded Philips of earlier agreements, the chemist refused to come to Zaandijk again since he feared that the design of the workplace posed a threat to his and his fellow workers' health.

Despite the eventual failure of Philips engagement in Zaandijk, this episode allows at least two preliminary conclusions. Firstly, it shows that chemists not only offered expertise in print, but also engaged in chemical tinkering at paper mills. More research would be necessary to find out whether collaborations between papermakers and chemists was incidental or more structural. On the other hand, the episode confirms that even in the decades around 1800, paper was considered a chemically complex product, whose production was only partly geared towards economic benefit. Next to financial profit, producers of paper relied on chemical expertise as a means to diversify their product portfolio according to shifts in taste and fashion among Europe's literate elite.

For the chemical practice in such small shops in Amsterdam in the late eighteenth century see: Weber, *Hybrid Ambitions*, chapter 1.

- 46 On Amsterdam's chemical industry, see: J. Goldberg, 'Journaal der Reize van den Agent van de Nationale Oeconomie der Bataafsche Republiek (ao. 1800)', *Tijdschrift voor Staathuishoudkunde en statistiek*, 19 (1860) and Herman Diederiks, *Een stad in verval. Amsterdam omstreeks 1800. Demografisch, economisch, ruimtelijk* (Meppel: Krips, 1982). On Philips workshop see also: Groninger Courant, 28 March 1837, online version: <https://resolver.kb.nl/resolve?urn=ddd:010771723:mpeg21:a0016>.
- 47 For a copy of a detailed inventory of a German workplace which the paper makers Van Gelder, Jan van Vleuten, J. Honig & Zonen, Jan Kool, Breet, Blauw & Briel seemed to have used for their own site, see Noord-Hollands Archief, Haarlem, 457 Van Gelder, inv. 1108, notes on bleaching experiments.

4 Conclusion

By conceptualizing material sensibilities as a means to study how the materiality of paper mattered to different actors in Dutch society, this essay argues that, at the end of the eighteenth century, paper was a chemically complex product, whose value depended not only on the price but on specific material properties. Contemporaries were very well aware that the effectiveness of a handwritten or printed note depended heavily on properties such as whiteness, flatness, texture, and the size of the paper used. The consequences of this were twofold: while papermakers and, to a lesser extent, paper traders had to keep a close eye on the taste of Europe's wealthy elite, chemists interested in paper making considered the material sensibilities of writers and paper makers as a means to promote their expertise in print and in practice. This also included tinkering with alternative plant fibres for the production of paper, new bleaching techniques, and attempts to recycle misprinted paper by advocating chemical deinking techniques. Although many of the suggestions were either never or only much later applied on a large scale, it hints at the changing status of chemistry in Dutch society and manufacture. For consumers of writing paper, the late eighteenth century Netherlands was an ideal location. Equipped with a large number of highly productive paper mills, individual and institutional consumers could choose from a dazzling amount of sorts and qualities of paper. Owing to stable prices and excellent quality, the growing state bureaucracy, learned societies and book producers avidly consumed paper from the Zaan area and the Veluwe. Taken together this chapter offers one important lesson for historians interested in contributing to a history of the paper trade: paper was not simply a trade commodity, but was also a product which evolved in and with society and whose material properties were therefore constantly in flux. By paying attention to the physical story of paper and cultural sensibilities regarding its quality, texture, and colour, we can uncover unexpected networks between actants – namely, papermakers and chemists – who collaborated in their efforts to further the recycling economy of the paper trade. In this chapter I have shown that the concept of material sensibility allows historians to work towards a more open-ended and material-centred history of paper in society. Only when approaching the field from such a processual perspective, will historians be able shed fresh light on the transformative role of paper in the late eighteenth- and early nineteenth-century world.