This is a repository copy of *'A unique instance of art':the proliferating surfaces of early modern paper*.

White Rose Research Online URL for this paper:
https://eprints.whiterose.ac.uk/114829/

Version: Published Version

Article:

JOURNAL of the NORTHERN RENAISSANCE

http://northernrenaissance.org | ISSN: 1759-3085

Issue 8 (2017) - Scrutinizing Surfaces

'A unique instance of art': The proliferating surfaces of early modern paper [1]

Helen Smith

'Materials are materials because inventive people find ingenious things to do with them'
— Christopher Hall, *Materials: A Very Short Introduction*

[1] In an interview with *Les cahiers des médiologie*, 'Paper or Me, You Know … (New Speculations on a Luxury of the Poor)', Jacques Derrida declares: 'I have never had any other subject: basically paper, paper, paper' (2005: 41). Alert to the doubleness of what it means to write 'on' paper, Derrida literally sets pen to paper, but also writes 'on the subject of paper, an actual paper, and with paper in mind'. The term 'subject' is not neutral: the history of paper, Derrida argues, is 'a history tangled up with the invention of the human body and of hominization' (43). Paper is, Derrida insists, 'heavy with all the assumptions that … are sedimented down into the history of the substance or the subject … but also that of the relationship between the soul and the body'.

[2] These enfolded 'papers' form the subject of my own 'paper'. I investigate the multitudinous uses of paper in early modern England with two aims: to challenge the prevalent notion of a "paper-short" society, and to go beyond the notion of paper as a surface for writing. For Derrida, it is precisely paper's susceptibility to inscription that gives it depth: 'Beneath the appearance of a surface, it holds in reserve a volume, folds, a labyrinth whose walls return the echoes of the voice or song that it carries itself' (44). Derrida's 'paper, paper, paper' is a playful inversion of surface and content, body and soul, haunted by the ghost of Hamlet's 'words, words, words'. Yet although Derrida remarks that paper has many uses – 'remember there is also wrapping paper, wallpaper, cigarette papers, toilet paper, and so on' (43) – this most stringent critic of logocentrism is insistently drawn to writing or printing paper by the allure of the 'graphosphere' (48), the inscriptive domain which, for Derrida, renders paper not simply a medium but a 'multimedia' substance (44). In the course of Derrida's essay, the whiteness of the surface becomes the whiteness of writing: 'spacing, gaps, the "blanks which become what is important," always open up onto a *base* of paper' (53).

[3] This article takes issue with the concept of the 'writing surface' on two fronts. On the one hand, it responds to Margreta de Grazia and Peter Stallybrass's insistence that 'the crucial quality of paper – its absorbency – eludes the dichotomy' of surface and depth central to the idea of the book (1993: 280). Writing does not exist 'on' paper, but sinks into the page, in ways that, as we will see, were experienced by early moderns not only as a practical problem but as a compelling figure for thought. As Juliet Fleming puts it, in a stimulating reading of Derrida: 'we will never have understood writing if we continue to think in layers, for "on" is only a special case of being "in" the world, a case that is locally stabilized but far from stable, and a fantasy more dominant than it should be, perhaps' (Fleming, 2016: 141). On the other hand, I draw attention to the manifold uses of paper that have nothing to do with writing: the modes of knowing made visible when we attend to the transformations and possibilities of the surface in, for example, papier mâché, paper medicines, and paper models.

[4] Paper is always at once a real presence and an idea. 'When we say "paper", Derrida asks, 'are we naming the empirical body that bears this conventional name? Are we already

resorting to a rhetorical figure? Or are we by the same token designating this "quasi-transcendental paper," whose function could be guaranteed by any other "body" or "surface"…?' (52). This article explores these questions in response to specific early modern instantiations of paper and its tropes, arguing that paper formed both a practical and an intellectual resource. Early moderns looked into, as well as at and through, their paper, seeing it as a remarkable material and an instance of the changeability of matter. Restoring paper's own capacity to fold, to create space and volume, I argue that its 'multimedia' potential is a function not of paper's status as a support for writing but of its unique physical properties.

[5] This article opens by arguing for the close connection between paper and thought, with an emphasis on the act of writing. It goes on to offer a brief account of paper manufacture and circulation in early modern England, arguing that paper was considerably more commonplace than has been acknowledged. After exploring natural philosophical and medicinal uses of paper in section three, I conclude by examining some of paper's domestic transformations, as the material of tricks and toys, and of decorative techniques. In each of its incarnations, paper is revealed to be an everyday wonder, an object of study and a subject of thought. Encountered outside the 'graphosphere' (though approached *through* the evidence of writing), paper is revealed as an endlessly proliferating, flexible, and generative substance.

'This blank paper'
[6] The blank receptiveness of paper is a longstanding trope with a rich early modern heritage, ranging from Othello's demand, 'Was this faire paper, this most goodly booke, / Made to write whore on?' (1622: K4[r]) to the 1635 translation of Vital d'Audiguier's tragicomic *Lisander and Calista*, in which '*Lisander* finding *Hippolita* with a minde free and vnpossessed like a smooth white paper, writ in fiery letters the euerlasting progresse of his loue' (Y1[v]). The routine gendering of this analogy is reflected in Thomas Cooper's definition of the Latin 'Charta' as 'Paper: a leafe of paper : any thinge conteynyng the discription of a place in picture: a mayde that had neuer childe: a booke' (1565: T2[r]). The trope equally expressed the impressionability of infants, whether in Richard Baxter's reflection that whilst children 'are young their understandings are like a sheet of white paper, that hath nothing written on; and so you have opportunity to write what you will' (1650: Aaaa2[r]), or John Locke's insistence that the gentleman's son he was engaged to tutor should be conceived of 'only as white Paper, or Wax, to be moulded and fashioned as one pleases' (1693: S3[r]).

[7] The Aristotelian heritage of the blank paper trope, with its connotations of inert matter and shaping form, is made apparent in David Browne's *The new invention, intituled, calligraphia*, which explicitly uses the language of Aristotelian matter theory to chart the causes of writing, though Browne admits that his taxonomy is 'more Metaphoricke than proper' (1622: ¶¶8[v]). Ink, he argues, is 'the Materiall cause of Writing … for as the paper is the subject whereon, so the Inke is the matter whereof'(¶¶¶1[r]). Browne uses 'subject' in a metaphysical sense, taking it to mean 'the underlying substance or essence of a thing', as distinct from its accidents (*OED* 'Subject', *n*. def. 5.). Along similar lines, Thomas Blundeville, writing in 1617, used paper as an instance of 'apposition' (juxtaposition or placing in contact): 'when a thing sheweth what his owne qualitie or operation is, by being put or added to another thing … Inke being put to paper … will make it black' (1617: O3[v]). In these definitions, we see what Derrida describes as 'the indeterminate "base" of paper, the basis of the basis en abyme, when it is also surface, support, and substance

(*hypokeimenon*), material substratum, formless matter and force in force (*dynamis*), virtual or dynamic power of virtuality — see how it appeals to an interminable genealogy of these great philosophemes' (53). Imaginatively cast as what is below, paper's significance expands until it becomes exemplary of substance itself.

[8] The potent metaphorics of writing were used to address a variety of theological and philosophical problems, from divine grace — '*As my paper whereon I am writing, receaueth the inke passiuely, and bringeth nothing of it to the writing &c. Whence it followeth, that in those whome God effectually will renew, their will can make no resistance, as my paper cannot reiect my writing*' (S. N., 1622: Aa4^v) — to the operations of memory: 'the memorie remayneth a power passiue, and not actiue: euen as the blew and the white of the paper, is none other than a commoditie whereby to write' (Huarte, 1594: F8^v). These examples, which illustrate Derrida's contention that the history of paper is the history of the subject, depend upon the imaginative inertness of paper; paper's very 'baseness' is what allows its structural and imaginative power to flicker into view.

[9] Near the beginning of 'Paper, or me, You Know', Derrida declares 'There is no need to trust blindly in all the discourses that reduce paper to the function or *topos* of an inert surface laid out *beneath* some markings, a substratum meant for sustaining them, for ensuring their survival or subsistence' (42). If Derrida is suspicious of the blank paper trope because it reinforces a history of the 'body-subject' as an 'immobile and impassible surface', we may distrust the figure for more mundane reasons. In Shakespeare's First Folio, Othello's question is punctuated with an additional question mark: 'Was this faire Paper? This most goodly Booke / Made to write Whore vpon?' (1623: vv2^r; figure one). In this instantiation, Othello's suspicions set not just Ophelia's chastity but the epistemological status of paper in doubt, directing the attention of the reader to the surface of the book.
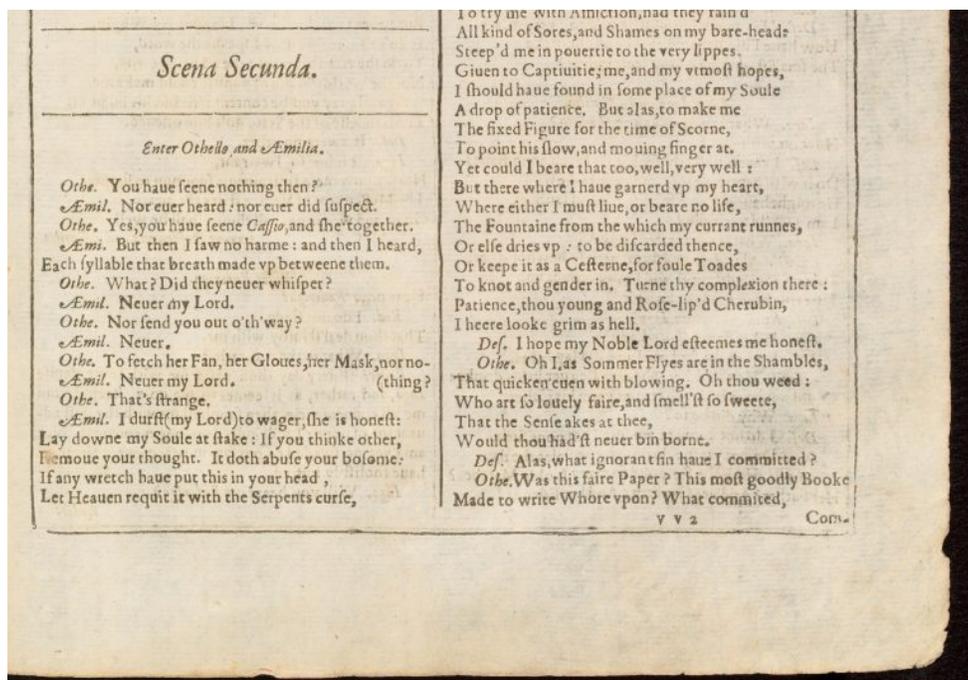
Figure one: Detail from William Shakespeare, *Mr William Shakespeares Comedies, Histories, & Tragedies* (Isaac Jaggard and Edward Blount, 1623), vv2^r. Image taken from The Bodleian First Folio: digital facsimile of the First Folio of Shakespeare's plays, Bodleian Arch. G c.7. http://firstfolio.bodleian.ox.ac.uk/

[10] Despite the popularity of the blank-paper trope, the experience of paper in early modern England was seldom one of a passive substance, though the finest papers were

beautifully smooth. Paper was understood as a surface that needed to be remade in preparation for use. Edward Topsell, in his *Historie of four-footed beasts*, reflected 'Of the teeth of Oxen I know no other vse but scraping and making Paper smooth with them' (1607: H5^v), an observation that scratches the surface of the symbiotic relationships brought into being by the application of products including white leather and breadcrumbs to the page. In order to delete pencilled guidelines for writing, 'that both the writ may the more viuelie [*sic*] appeare, and thine owne ignorance the lesse', David Browne suggests rubbing them 'softlie with a piece of Wheate bread' (1622: B6^r). Such practices might lead to a proliferation of cultures on the surfaces of culture: the Victoria and Albert Museum website warns that 'Oily residues or small crumbs trapped in the paper fibres will support mould growth' (see also Timmermann, 2013). Writing and some printing paper was treated with size, a glutinous substance made of parings of animal hide, in order to prevent the paper from absorbing too much ink (Barrett, 2012). Artists', engravers', and surveyors' guides describe treatments to 'strengthen the paper, … make the colour shew the brighter, and last, the better' (Bate, 1634: R1^r), or keep 'the colours from sinking into the paper, … make them shew fairer, and keep them from fading' (Salmon, 1672: P2^v-P3^r).

[11] Like the blank-paper trope, the experience of meeting with a 'rough', 'hard', 'dry' or 'nought' writing surface helped authors grapple with complex moral and philosophical knots. Pondering the meeting of nib and surface as an analogy for the relationship between preacher and audience, Nehemiah Rogers reflected:

> respect must bee had vnto the *Auditory*, as the good Pen-man hath in nibbing of his Pen vnto the kinde of *Paper* he writes vpon, that it agree with it. Some hath a hard and crosse graine, which soone takes off the edge of a *Tender Penn* … Some paper againe hath a more fine, and tender graine, with which the *Smaller Penn* doth best agree: Your Ordinarie *Paper* is *Pot-paper* of a middle nature, and requires, that the nib be neither too soft, nor too hard, but brought vnto a meane (1632: C2^v-C3^r).

In a 1607 collection of proverbial wisdom, Nicholas Breton told readers, 'Good Incke graceth a letter, but if the paper bee nought, the penne will doe no good' (1607: D1^v). The moral applicability of this commonplace is driven home in T. G.'s *The rich cabinet* (1616):

> Reason vttred by a plausible tongue, makes perswasions passable with a popular eare; but iudgement that discernes substance from colour, the maske from the face, the forme from the matter, will easily find out the fallacie and error: euen as a good pen doth helpe and grace a good writer: but if the paper be nought, he shall make many a blot for a letter, or commit such slender faults as will bee easily discried by a Scriuener (R5^v).

Writing in 1653, William Twisse emphasised how paper and user come together to form good or bad writing: 'A good Scribe meeting with moist paper will make but sorry worke. The writing is from himselfe, the blurring from the moistnesse of the paper' (Kkk2^v). Twisse uses this truism to explain the knotty problem of whether sin comes from God: Aquinas, he explains, insists that though God acts upon the believer, the imperfections of embodied existence register themselves in the 'blurring' and blots of sin.

[12] The examples above are 'matterphors': ways of thinking which inhere in the physical and are 'at once linguistic, story-laden, thingly, and agentic, … materiality coming into and out of figure' (Cohen, 2015: 4). They register the intimate connection between the physical

presence of paper and its imaginative power, asking us to understand the surface of the page as a figure for consciousness, a figure which always operates in conjunction with 'actual paper', a physical surface that inserts itself into the experience of writing. The Particular Baptist minister, Christopher Blackwood, appropriated 'S. N.'s' use of the blank paper trope to figure the operation of God on the will of the convert. 'We will when we will, but God makes us for to will. ... As my paper whereon I write, receives the ink passively, and brings nothing of its own to the writing' (1654: G4^r). Yet Blackwood's conclusion complicates this figure: 'being written upon, it becomes an instrument with my writing; and as I write more and more, so it still co-operates with me, though in it self there be no natural beginning of the writing'. The paper becomes, if not a collaborator, at least a participant, an object that works together ('co-operates') with the writer, and is at once paper — 'real' paper — and the devoted subject, opening herself to the will of God.

'the want and dearth of good paper'

[13] There is a distinct irony in the fact that my sources for this 'paper' are overwhelmingly textual: paper lances, boats, boxes are hard to find in archives or museums; ditto samples of 'oil of paper', bloodied paper bandages, or the burnt remains that once protected the ears of a roasting hare. The range of early modern paper possibilities are preserved in two of paper's most privileged instantiations: the codex and the manuscript letter. A similar privileging of script and print lies behind the orthodoxy that early modern England was a paper-short society.

[14] Three sources reveal something of the diversity of early modern paper. Between September 1567 and September 1568, the (parchment) London Port Books record the importation of 13,209 reams of 'paper' (presumably white paper of various sorts); 368 reams of 'printing paper'; 54 reams of 'writing paper'; 602 reams of 'loose paper'; 275 reams of 'cap paper'; 80 reams of 'loose cap paper'; 160 reams of 'small paper'; 3 reams of 'coarse paper'; 4500 bundles of 'brown paper'; 300 bundles of 'paper' (presumably brown); and 1200 paste boards; as well as 238 gross of playing cards; 12 gross of 'paper combs'; 6 gross of 'paper buckles'; and 50 'papers' of 'single mockado' (a velour fabric).[2] Pins and threads were sold by the paper; a mid-seventeenth century manuscript treatise explains that English pins were initially of such poor quality that the manufacturers used papers with foreign makers' names and marks in order to sell them. The writer went on to appeal for a suspension of customs duty on paper and the dye used to colour it blue (SP 16/438, f. 87).

[15] My second source, a 1650 *Act for the Redemption of Captives*, lists the duty levied on imports and exports, and includes paper fans, blue paper (also used for sugar), brown paper, cap paper, demy paper, 'ordinary Printing and Copy Paper', painted paper, pressing paper (for the fabric trades), 'Rochell paper as large as demy Paper', and royal paper (E7^r). Similar lists for Scotland add '*Morlax* paper', 'Paper of *Cane* and *Roan*' (1657: O1^r), and 'Gould papers, the groce' (1611: E2^v). Decorative papers became more common as the period progressed, with the first English patent for 'paper for Hanging' awarded to E. and R. Greenbury in 1636 (Dard Hunter, 1947: 481; see Fleming, 2013).

[16] Dating from significantly earlier, my third source comprises accounts for a banqueting house constructed for Henry VIII at Greenwich. 'Wages to moulders of paper, day and night' are listed alongside payments to joiners, sawyers and carpenters; construction materials include white paper (itemised three times), royal paper at 8*d*. a quire, 'brown and white paper to make knots with', 'wax and roson for moulds of paper', 'gold paper, silver and green', 'shavings of white paper to make lions, &c., and the King's arms', 'moulds of paper for the vaulting of arches', and a payment of 8*d*. for 'Cutting of gold paper, silver paper, and

orsedye [bronze leaf] for the candlesticks'. Two days later, the Revels' accounts included a ream of green paper, white paper at 2*s*. 4*d*. a ream, and silver paper at 2*s*. 4*d*. a doz. (Henry VIII: May 1527: 6-10). Paper continues to appear in the Elizabethan and Jacobean Revels accounts, used to create everything from unicorns to mountains.

[17] This is, of course, an elite source, as is an inventory describing stocks for a royal banquet in May 1526 which includes '8 "quayres" white paper, at 2*d*. the quire.½ bundle of brown paper, 6*d*.', and '4 green paper, 6*d*. 4 white silver paper, 6*d*. 4 sinaper paper, 6*d*. One paper of fine gold, 2*d*. 1 quire white paper, 2*d*.', much of it used in the creation of edible conceits (Henry VIII: May 1526, 1-15). The use of paper for culinary purposes extended down the social scale. Printed and manuscript receipt books (still relatively elite sources) did not just use paper (Leong); they included it among their ingredients and techniques.

[18] In a list of necessaries for a banquet included in his *Good housewives Iewell* (1587), Thomas Dawson suggests the efficient domestic manager should equip herself with 'Paper White and browne' (C8r), while in *The compleat servant-maid* (1677), Hannah Wolley not only offers copious instructions for writing, including the art of letter-folding, but iterates numerous other uses for paper: preserving cherries; making cakes; candying and preserving flowers; making comfits; covering seeds or fruits with sugar; making marmalade of grapes; curing the bloody flux; toning down a red face; dying bone or quills; shaping starched lace; and — jarringly — preventing miscarriage. Wendy Wall has recently argued that early modern recipe books reveal 'differently tactile ways that literacy might signify, and … dramatically expand the scene of literacy formation', including the quite literal consumption of alphabetic forms (2016: 115). An attention to kitchen uses of paper similarly encourages us to re-think women's — and men's — relationship to paper products; cooks might have a fine sense of the grades of paper, their suitability for specific culinary and decorative occasions, and the utility of their particular properties. Instructions 'To make Spanish Biskit' in Elizabeth Fowler's late seventeenth-century cookbook, tell the reader to 'take wafer paper & lay in the thing If you dissine to bake it in it … set them in the ouen at the disscrestion of the baker' (Folger MS V.a.468, fol. 67r-v). Rather more precisely, a seventeenth-century manuscript receipt for 'bisket', attributed to 'Mrs E: A:' tells cooks that the 'oven must be soe hot as to turne a peece of white paper browne' (Folger MS V.a.8, fol. 110).[3] Similar principles underlay instructions for secret writing: letters composed in orange or lemon juice had to be warmed in order for the writing to be revealed. Far from being paper-short, early modern England was a society in which diverse kinds of paper circulated, and were used for a wealth of purposes.

[19] At least some of that paper was produced domestically. Wynkyn de Worde's edition of Bartholomaeus Anglicus's *De proprietatibus rerum* (1495) celebrates its own 'bryght' pages with a closing rhyme:

> And John Tate the yonger Ioye mote he broke
> Which late hathe in Englonde doo make this paper thynne
> That now in our englyssh this boke is printed Inne ([pp1r]).[4]

Though Dard Hunter suggests that Tate's enterprise quickly failed, in his will of 1507, Tate bequeathed 26s 8d of 'whit paper … of my paper mill at Hertford' to Thomas Boll and instructed his executors to sell the mill 'with all the commodities concerning said myll to the moost advantage' (Hunter, 116), suggesting it was still in operation. Later evidence appears in William Vallans's poetic celebration of the River Lee, which records that 'In the time of

Henry the eight [i.e. VII] viz. 1507 there was a paper Mill at *Hartford*, and belonged to *Iohn Tate*' (1590: C1^r ; see Hills, 1988: 5-12).

[20] The need for domestic paper manufacture was a recurring theme: in 1538, an anonymous writer argued for a monopoly on bible printing, which might be contingent upon the printer being 'bounde to bylde a paper myll or twayne … I thynke ii paper mylles wolde make as moche paper as wolde serve all the prynters in Englande' (SP 1/242, ff.132^{r-}^{v}). Between 1554 and 1559 a mill may have been in operation at Fen Ditton in Cambridgeshire (Jenkins, 1958: 159). Another short-lived paper mill was founded by Sir Thomas Gresham on his estate at Osterley in around 1577, but recorded as 'decaied' by John Norden in 1593 (F3^r). It may have been these ventures to which the stationer Richard Tottell referred in 1585 when he set out his plans to erect a paper mill, complaining at 'the want and dearth of good paper in this Realme and also the disceite that is used Dailye in makeinge therof', an intriguingly self-contradictory statement. Blaming foreign competition, Tottell declared that French paper merchants had undermined previous efforts by buying up 'all our ragges'; bringing in 'greate aboundaunce of paper' and selling it at a loss; and harassing the workmen (SP 12/185, f. 172). There is no evidence that Tottell's scheme came to fruition.

[21] A mill was founded at Dalry in Scotland in 1590, continuing in business until around 1605. In that same year, Robert Stansbye, Randall Wood, and John Zelldre, papermaker, leased land from John Goaydon in County Kildare to build the first Irish white paper mill (Pollard, 2000: 235; 547). A letter of June 1592, written by Archbishop Loftus, introduced Nicholas as a man broken by a run of ill fortune which included having taken 'in hande a woorke that hath muche disabled him, the buyldinge of a paper mill' (SP 63/165, f. 159). A second Scottish papermill was started c. 1652 at Canonmills, on the Water of Leith, and continued until at least the 1680s (Thomson, 1974: 9-11).

[22] Also in 1590, John Danett, deputy muster master, wrote from Dublin to Sir Thomas Williams, complaining that 'paper is heere very deere, very scante & very badd. neere Ivie bridge [London] dwellinge. Mr Spilman a jeweller & maker of paper where it maye be bought for vs vjd the realm very large, very good' (SP 63/156, f. 4^r). It was John Spilman, Goldsmith to Queen Elizabeth, who founded the most significant sixteenth-century white-paper mill, in 1588. In October of that year, Sir Francis Walsingham issued a warrant to Justices of the Peace requiring them to prevent the High Germans 'that be work men wth Mr Spilman her ma^{ties} jeweller in his paper mill' from leaving the country (SP 12/217, f. 114). A 1589 patent, renewed in 1597, granted Spilman a monopoly on buying or dealing in rags 'fitt for making all sorts of white paper', and decreed that all paper-making, including in mills 'alreadye made erected or used for broune paper', could only take place with Spilman's licence (C 66/1331; *CSPD*, vol. CCLXIV, 7 [12], July 4 1597). A 'letter of assistance' issued by the Privy Council in 1591 required 'all publique officers' to assist Spilman in maintaining his monopoly (PC 2/19 f. 290). In 1600, Spilman complained to the Privy Council that John Turner, Edward Marshall, and George Friend had 'lately erected a paper mill' in Buckinghamshire, gathering the 'best and finest stuff … wherewith your Sup^t doth use to make the white writyng paper', for want of which 'your Supt mills are often in danger to stand still' (SP 12/276, f. 6^r); he subsequently complained that 'this Petitioner is forced to make brone paper when otherwise he would make writyng paper' (f. 6^v), though it remains unclear what kind of paper his competitors were manufacturing. The following year, Francis Bacon reported to Lord Keeper Egerton that he had judged a case lodged by Marshall and Robert Style against Spilman, and adjudicated that Style must 'surrender upp his lease and

that he enter into bonde not to intermeddle in buyeng or providing any stuffe for the making of paper or buylding using or keeping any paper mill' (SP 12/282, f. 16).

[23] Spilman was also involved in a dispute with the Lord Mayor and aldermen of London over the collecting of rags in 1601 (SP 12/279, f. 164). In combative mood, the City authorities replied that they had been forced to take action as Spilman's rag collectors 'ranged abroad in every street, begging at men's doors' (f. 165[r]). Moreover, they complained, Spilman's claim to novelty was 'an error; for others before him have performed the same, and erected paper mills at Osterby, near this city, at Cambridge, Worcestershire, &c.'. No further news of Spilman's mill appears in the State Papers until, in March 1617, he was granted a patent for making 'a new and more pleasant kind of playing cards' (*CSPD*, vol. XC [116]).[5] The City's emphasis on the commonplace nature of Spilman's activity, while undoubtedly rhetorically motivated, deserves to be taken at least as seriously as Spilman's insistence on his mill's exceptional status. By 1640, however, when Endymion Porter, John and Edward Reade, and John Wakeman applied for a patent 'for the sole workinge, or milling & making [of white writing paper] in yor Kingdoms of England, Scotland & Irland for the forme of 57. yeares' (SP 16/403, f. 111), Spilman's mill and its predecessors appear to have been wiped from political memory; John Bankes, the Attorney-General, urged that the petition should be granted, 'the Arte of making white writing paper being a New invention not heretofore used in this kingdome' (f. 112).

[24] The memory of writing paper manufacture in England may have been still more ephemeral than the product. Yet, as the wranglings outlined above make clear, England's history of paper-making was more continuous and more substantial than an emphasis on white paper allows. In 1598, the Earl of Nottingham signed a warrant which reported that Spilman had complained that 'divers and sondry persons … have not onely … gathered and bought up the said stuffe and converted yt to the makeinge of browne paper, whereas yt would have made good wrightinge paper, but have erected divers milles for the makeinge of paper', wording that suggests brown paper mills were well established in England (PC 2/24 f. 61); Shorter records the existence of thirty-eight English paper mills in the first half of the seventeenth century (1957: 29; see also Gavin, 2012; Luker, 2009).

[25] In 1641, Sir Edward Ford lambasted naysayers who objected to his plans to divert the River Colne at Rickmansworth. The protests included the plans' impact on the paper-mills, which prompted Ford to declare that 'the water taken for this Worke cannot possibly bee missed' by the mills, which 'are but seaven in all' (1641: B3[r]). While it was in Ford's interests to downplay the significance of the paper industry, that he felt able to dismiss seven mills as an insignificant handful suggests the degree to which the paper industry was thriving. Writing in 1655, an anonymous correspondent of Samuel Hartlib reflected that:

> The finest paper we have in *England*, comes from *Genoa* and *Venice* …Much of this paper is gilded with Gold on the edges. *Holland* ships not onely furnish us with a thick strong white paper, which is commonly called *Dutch* paper, but also abundantly with a strong brown paper much desired by the Grocers. (Although at present, lesse is imported because we have many Paper-mils lately erected) (Anon, 1655: V3[v]).

Brown paper, then, which like waste paper was also pasted together to make cardboard and pasteboard, circulated in quantities which are impossible to quantify, alongside smaller quantities of white paper, and papers of every colour from red to gold. Though he was writing to hyperbolic ends, as part of a commendatory poem celebrating Spilman's mill,

Thomas Churchyard was not exaggerating when he demanded: 'What man, or sex, or shape of worthy molde, / can paper lacke, but buies it lesse or more?' (1588: C4^v). If not entirely everyday, paper was, at the least, a familiar and flexible material, with a range of uses extending far beyond the textual.

'A Unique Instance of Art'

[26] According to Francis Bacon, it is precisely the commonplace nature of paper that should make us alert to its remarkable qualities. In his *Novum organum* (1620), Bacon calls on his contemporaries to take special notice of 'Monadic cases of art' [things which are unique to themselves]. Arguing that 'things which really should evoke wonder because of the inherent difference of their species compared with other ones, nevertheless attract little attention if they are in everyday use', Bacon turns to an example which is close to hand: 'For example, a Monadic instance of art is paper, a thing extremely common', not least on the desk of a civil servant and natural philosopher (305). Bacon is struck by the properties of paper, and in particular its flexibility. The cellulose fibres of paper mean that it can be crumpled or folded and retains its shape once creased; it can be stitched, pinned, or cut with remarkable precision; it remains firm and in distinct sheets when dry, but becomes weaker and moldable when wet; and it can be rolled or layered, increasing its strength and thickness.

[27] In this reflexive moment, Bacon both invites us to speculate upon the nature of paper, and makes us alert to the substance of the book we are reading. Contrasting it to other artificial materials, Bacon describes paper as 'a tenacious body which can be cut or torn, and so imitates and practically competes with any animal hide or vellum, or any plant leaf, and suchlike works of nature'. At least in some of its early modern incarnations, this contrast may have struck the reader in immediate, haptic terms: Newberry library VAULT Case folio B 49 .059, for example, is bound in vellum, allowing for immediate comparison between the book's fine paper and animal skin.

[28] Early moderns were alert to the literally material histories of their texts. In his encomium to Spilman's paper mill, Churchyard celebrates the quasi-magical process through which 'sundry secrete toyes, / makes rotten ragges, to yéelde a thickned froth', which is stamped, washed, and dried to form paper (1659: D1^v). Reflecting on writing paper's passage through 'many handes', Churchyard notes it is 'A wonder sure, to see such ragges and shreads, / passe dayly through, so many hands and heads', a trope which aligns the constitutive matter of the paper — its rags — with the diverse compositions written upon it. Lothar Müller notes that 'the contrast between paper's base origins and its lofty calling is a common motif in the texts accompanying visual depictions of papermakers and paper mills in early modern books of trades' (2014: 49-50). A frequently reprinted 1659 translation of the Czech philosopher Comenius's textbook, *Orbis sensualium pictus*, includes a compressed illustration of paper's history and manufacturing techniques (figure two).
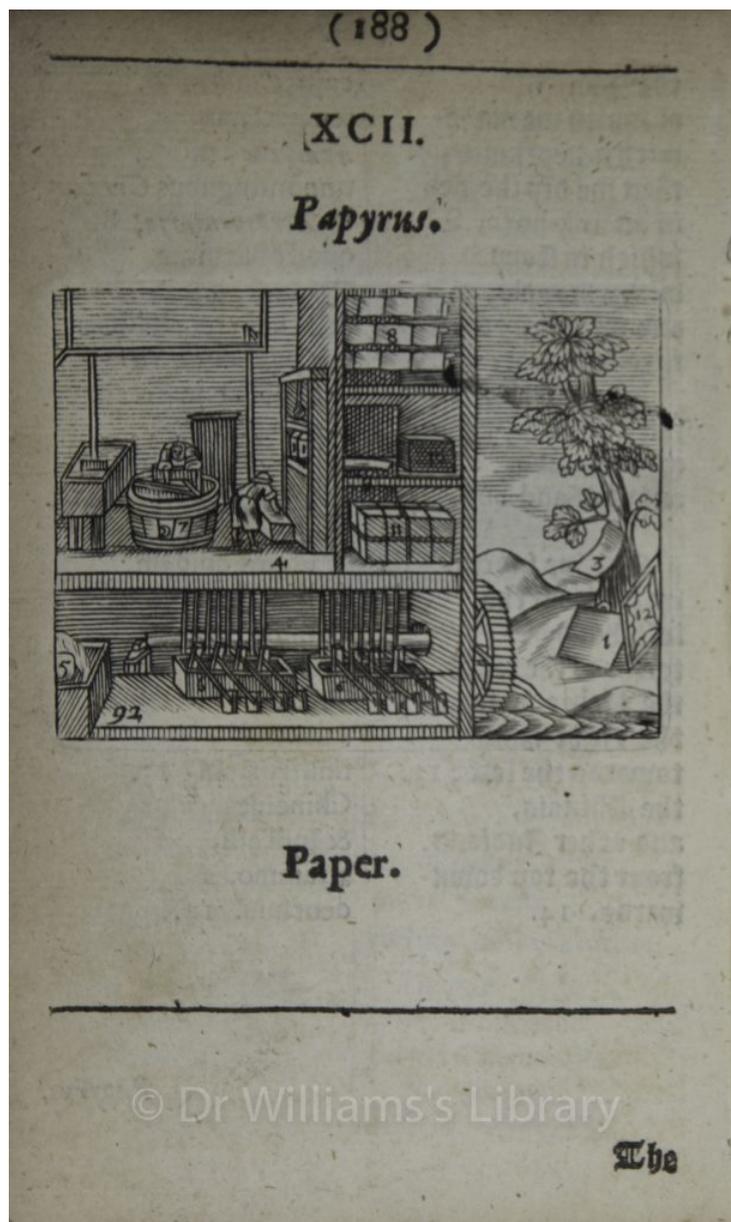
Figure two: Johann Amos Comenius, *Orbis sensualium pictus* (London: J. Kirton, 1659), N6^v-N7^r. Reproduced by kind permission of Dr Williams's Library, London.

[29] In Abraham Cowley's *The guardian* (1650) paper's material history takes on a moral valence, eliding contents and substance, as Truman threatens to burn an unfortunate letter:

> Unhappie paper, made of guilty linen.
> The menstruous reliques of some lustful woman:
> Thy very ashes here will not be innocent,
> But flie about, and hurt some chaste mens eyes (C3^r).

The past uses of the paper's ingredients inhere in its volatile remnants; it is not the writing Truman blames, but the stuff. This is paper as 'matterphor', a material history that continues to figure in an imagined future. In a play concerned with the discrepancy between intention and reception, it is notable that Aurelia disguises herself with a paper mask: 'Were not you the vertuous gentlewoman with the brown paper-face, that perswaded me to it?' (C2^r), asks Dogrel, collapsing together Aurelia's disguise and her body.

[30] Perhaps the best-known celebration of paper manufacture comes in John Taylor's 1620 *The praise of hemp-seed,* in which the poet declares:

> But paper now's the subiect of my booke,
> And from whence paper it's beginning tooke:
> How that from little *Hemp* and flaxen seeds
> Ropes, halters, drapery, and our napery breeds,
> And from these things by Art and true endeuour,
> Al paper is deriued, whatsoeuer (1620: D4ʳ).

Taylor provides a history and ethnography of paper in a series of relentless puns that demonstrate his alertness to the grades and varieties of paper in circulation. In a more sombre register, Henry Vaughan meditated upon his book, reminding God:

> Thou knew'st this *papyr*, when it was
> Meer *seed*, and after that but *grass*;
> Before 'twas *drest* or *spun*, and when
> Made *linen*, who did *wear* it then: (G8ᵛ)

Drawing attention to the early modern page's history as recycled rags, de Grazia and Stallybrass suggest that the 'Renaissance book [is] a provisional state in the circulation of matter' (1993: 280). For Vaughan, whose understanding of the formation of paper is distinctly lacking in detail, this is a moral lesson: his perishable pages are intended to remind their reader of her own corporeal provisionality.

[31] In a stimulating reading of Vaughan's poem, Joshua Calhoun observes that the browned pages we encounter in rare books libraries are less likely to be discoloured by age than by the muddy or silted water used in their manufacture. Calhoun points out the 'network of flecks and fibers' embedded in early modern paper: vegetable fibres, 'shives' (husky fragments of the flax stalk), and scraps of cloth persisted through their transformation into cloth and then paper (2011: 332-3; on the connections between paper and plants, see Knight, 2009: 8-10). Describing the bookworm, Robert Hooke speculated that it finds, 'perhaps, a convenient nourishment in those husks of Hemp and Flax, which have pass'd through so many scourings, washings, dressings and dryings … ; the digestive faculty, it seems, of these little creatures being able yet further to work upon those stubborn parts, and reduce them into another form' (1665: Ff1ʳ⁻ᵛ). Hooke's deductions, which register the shifting forms of the essential matter of the flax, offer evidence that attentive book-users were alert to the presence of shives and fabric, and also remind us that paper was an object of natural philosophical and alchemical inquiry.

[32] In 1670, Daniel Cable translated (the possibly fictional) Valentinus Basilius' alchemical tract *Of natural & supernatural things*, which charts the progress of seed to flax to fabric to paper. The full title of his translation, which promises to reveal 'the first tincture, root, and spirit of metals and minerals, how the same are conceived, generated, brought forth, changed, and augmented', suggests how paper could be read as representative of the transformations of matter. 'When this Linnen is quite worn out', Basilius tells us, 'the old Rags are gathered together, and sent to the Paper-Mills' (1670: H4ʳ). But this is not the end of his material history:

> If you lay Paper upon a Metal or Glass, kindle and burn it, the vegetable *Mercury* comes forth and flies away into the Air, the Salt remains in the ashes

and the combustible *Sulphur* which is not so quickly consumed in the burning, dissolves to an Oil … This Oil hath in it a great fatness, which is the Matter of the Paper, contained originally in the Seed of the Flax; so that the last Matter of the Flax which is Paper, must again be dissolved into the first Matter … that so the first may be made of the last, and the ground-work revealed, so the Virtues and Operations known by the first (H4^v).

Whilst his insistence that 'the first may be made of the last' expands Basilius's observations into biblical time, his emphasis on the persistence of the essential matter of the flax-seed in the paper asks us to understand the transformations of flax, cloth, and paper as changes of form rather than radical metamorphoses.

[33] Numerous texts, from at least as early as Thomas Lupton's *A thousand notable things* (1579), contain recipes for oil or spirit of paper, a substance that reminds us that early modern paper was greasier — more skin-like, as Bacon notes — than its modern counterparts. Published in 1686, Nicolas Lémery's instructions drive home the extent to which paper was a tool of the experimental method, as well as its subject: burnt paper is filtered through 'a coffin of brown paper' to produce 'a thick, black, and il-scented oil' (Cc2^r; this recipe does not appear in earlier editions). Paper was used as a filter and to create rolled tubes and tools: Hannah Wolley, for example, recommends that those who suffer from 'an extream Rheum falling from the Head' take the smoke of balsam and red sage 'through a paper tunnel into your mouth … every morning till you find a Cure' (1674: B9^v), and, in instructions to make 'Sea-Green', instructs the reader to let an ounce of verdigris boiled with a pint of white wine 'drop thorough a double Brown-paper' (D8^r).

[34] Lémery observes that spirit of paper is 'very acid', a property which he attributes to 'the many different forms which the flax, and canvas have received, in order to make cloth, and afterwards Paper' (1686: Cc3^r). The material history of paper has material effects: 'oil of paper' possesses the properties that it does precisely because of the multiple transformations undergone by the flax. Hugh Plat meanwhile insists that 'the true spirit of wine' can only be distilled by using 'the finest Paper you can get, or else some Virgine parchment' (1602: E1^v), whilst the recipe to amend an inflamed complexion included in *A choice manuall*, attributed to the countess of Kent in 1653, calls for white paper, literalising the trope of a red and white complexion (M6^r).

[35] Where Basilius notes that oil of paper makes 'a good Medicine for dim and defective Eyes', Lémery suggests that it 'has some use in Physick: the oil is good for deafness, whilst the fumes of burning paper relieve hysterical women' (Cc1^v-Cc2^r). Paper was an essential ingredient for both the domestic and the professional medical practitioner. In 1678, Moyse Charas described the indispensable contents of *The royal pharmacopoea*, which included 'Marble, Porphyrie, Sea-shells, divers Stones and Jewels, certain Horns, several Bones, divers Shells, as also the Eggs and Skins of some Animals; Woods, Roots of Trees, Shells of certain Fruits, Woollen and Linnen-Cloths, Silk, Hemp, Flax, Rind of Trees, Horse-hair, Ropes, Pack-thred, Paper; divers Earths, and Sands, Glasses, Chrystals, Bitumens' (G4^r). Rendered exotic through its affiliation with this diversity of ingredients, paper, Charas tells the reader, is used 'to filter several Liquors, to cover bottles, pots, and to wrap up several Medicines' (G4^v). The drying properties of paper aided the cure of those who suffered such painful diseases as 'ulcers engendred in the priuie members' (Barrough, 1583: M4^v).

[36] Paper medicines were made at home: one cure for 'children that bee broke' instructed parents 'Take white Paper, and chawe it well with your teeth, and make thereof a plaister, as great as wil couer al the broke, binde it in a swadle band with a linnen clothe' (Ruscelli, 1562: H4r). In a rather more literal sense than Derrida intended, the history of paper becomes the history of the body, creating a surface that imitates and heals the skin. Paper plasters, as well as cloth ones, were frequently recommended, and the flaxen composition of paper may have made the two interchangeable; Joseph Blagrave suggested that 'the young Chirurgion' must always carry plasters 'ready spread upon cloth or paper' (1585: T6^r). For haemorrhoids, the Countess of Kent suggested laying powdered burnt cloth on brown paper, 'and with spittle make it Plaister-wise, and lay it to the place' (1653: I4^v-I5^r). Thomas Bonham's plaster for a toothache, set out in a book which interleaves its printed contents with blank paper pages to allow for notes and additions, calls for doubled gray paper (1630: Ee4^v); Robert Boyle suggests honey spread on Cap-paper 'For an Outward Contusion' (1692: D2^v); and 'T. C.' treated migraines with egg and flax laid upon russet Paper (in the same recipe suggesting 'a fold of russet paper or els of linnen' should be put between the medicine and the skin; H4^v). In the work of the minister John Edwards, these practices lend a distinctly material charge to his wish that his book might cure the reader of sin: 'O that this *Paper* might prove a *Plaister* to *draw it*!' (1578: A2^r).

[37] Less scrupulous parents, according to the physician John Jones, might mould their children, not as if they were paper, pace Baxter and Locke, but with paper: Jones accused 'ouer curious and daintie Dames' of altering their children's bodies by binding them in 'Brasers, Wastes, or bodies, made eyther of paper bordes, plate, or Cardes, &c. to make them slender' (1579: G2^v). Some invalids may even have sported paper prosthetics. Ambroise Paré suggested that 'such as want their eares, either naturally or by misfortune' should have another 'made of paper artificially glewed together, or else of leather, and so fastened with laces, from the toppe or hinder part of the head, that it may stand in the appointed place, and so the haire must be permitted to grow long' (1634: Ddd6^r).

[38] If paper was a subject of study for the natural philosopher, it was also a powerful tool which attained some ingenious shapes. In 1582, the library of Henry Fitzalan, twelfth earl of Arundel, was described as being enviably stocked with 'books on the arts, philosophy, jurisprudence, medicine, mathematics, theology and history, and spheres, globes, bronze and paper instruments of all kinds' (Dent, 1962: 59). Later in the period, members of the Royal Society made use of the handiness and flexibility of paper in a range of tools. Samuel Pepys lamented in July 1668 that 'the month ends mighty sadly with me, my eyes now past all use almost; and I am mighty hot upon trying the late printed experiment of paper Tubes', an account of which had appeared in the *Philosophical Transactions of the Royal Society* (Pepys, July 31, 1668; Royal Society, 266-67).[6] A few days later, he reported himself 'mightily pleased with a little trial I have made of the use of a Tubespectacall of paper, tried with my right eye' (11 August, 1668; see Wilson et al). Robert Boyle is frustratingly coy in mentioning, in 1669, 'a little Instrument of Paper' which 'that Sagacious Mathematician Dr *Wren*' rustled up for him 'with great dexterity as well as readiness' in order to demonstrate the efficacy of the air-pump. The nature of this device is unclear: Boyle claimed he would have made much greater use of it 'had it not been casually lost when the ingenious Maker was gone out of these parts' (T3^v-T4^r). In the same experiment, Boyle used a 'small Label of Paper, about an 8th of an inch in breadth' to create a 'litle Instrument' of feathers to test air resistance (T3^r). A marginal note directs the reader to its visualisation in '*Plate the Fig. the*'

(in fact, Plate VII), an awkward reminder of the limits of the book as a technology of paper and print.

[39] Matthew Hunter has investigated the competitive cleverness of Hooke's paper model of a telescopic micrometer, whose moveable paper patch allowed for the visualisation of both exterior and interior mechanisms. Printed by John Martyn, the model was 'made as a multiple, to be printed, cut, pasted and sold' (Hunter, 2013: 549). Other DIY paper tools were available: John Blagrave gave careful instructions to those who wanted to assemble the 'singuler instrument' he termed his 'mathematical jewel', assuring them that if they were careful 'in the cutting out of the branches & barres, he wil serue you a long time to better vse then one of mettall' (1585: ¶¶2^{v}). Where Blagrave's astrolabe formed part of the book which explained it, and has — at least in some cases — been cut and assembled according to his instructions (figure three), William Oughtred told readers of his *Dialling performed instrumentally* that 'if any shall desire to have this Instrument ready printed off in paper for his use or practice, hee may bee furnished with what quantitie hee desire's by *William Hope* Book-seller at the Blew Anchor' (1652: E3^{v}).

Figure three: John Blagrave, *The mathematical jewel* (London: Walter Venge, 1585), inside front cover. Cambridge University Library LE.28.5. Reproduced by kind permission of the Syndics of Cambridge University Library.

[40] Outside of the English context, Johannes Kepler wrote to Friedrich I von Württemberg in 1596, enclosing with his letter a paper model representing the universe as it was mapped out (using geometric forms) in his *Mysterium Cosmographicum*, published in the same year (letter 30, pp. 65-7). Less appealingly, Johannes Goedaert recalled in his study *Of insects* that 'I had a mind to try what wou'd become, of the putrid and corrupted *Vrine* of a man; I made a Funnell of paper, and so folded it, that no *Fly* or other *Animall* cou'd get into it: having infused into it oft times humane *Vrine*; I found some *Worms* to be bred in the folds, where the feces stayed' (1682: R2^{r-v}). This apparently self-generating matter stands for the generative presence of the crease or fold, multiplying the surfactual presence of the paper.

[41] A practical engagement with the properties of paper also characterised anatomical texts: Vesalius's *De humani corporis fabrica librorum epitome*, printed in Basel in 1543, was the first book to use intricate layered paper manikins to reproduce the complexities of human body; a fashion that was quickly taken up across Europe, including in England (figures four and five).

Figure four: from *Vif pourtraict des parties interieures du corps humain* (Paris: chez Alain dematonniere, [1560?]). Wellcome Library L0055146 . © Wellcome Library, London.

Figure five: from *Interiorum corporis humani partium viva delineation* (s.n., [London, ca. 1559]). Wellcome Library L0055210. © Wellcome Library, London.

More and less intricate volvelles (paper dials with moveable parts) were used for astrological calculation, navigation, and prognostication (figures six, seven, eight, nine, ten, eleven, twelve; see Karr).
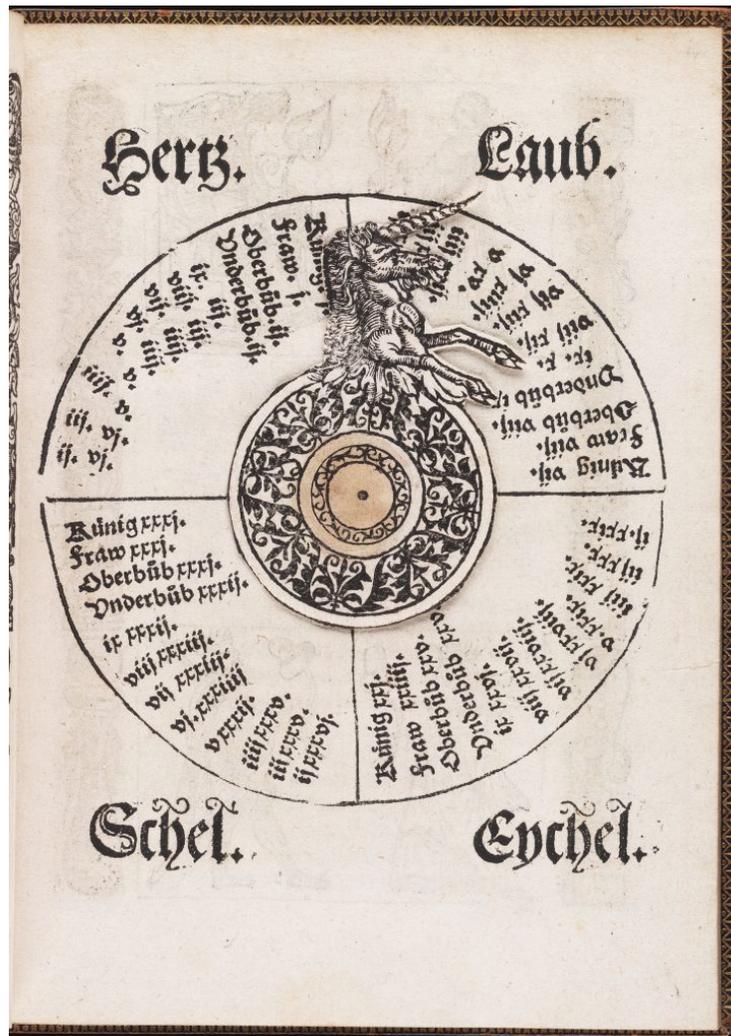
Figure six: Volvelle with unicorn, from *Kartenlossbuch: Darinnen auss H. Schrifft vil Laster gestrafft, vnd heylsamer Leeren angezeygt werden* (Strasbourg: Jacob Kammerlander, [1543]). Beinecke Library 1976 335. By permission of the Beinecke Rare Book and Manuscript Library, Yale University.
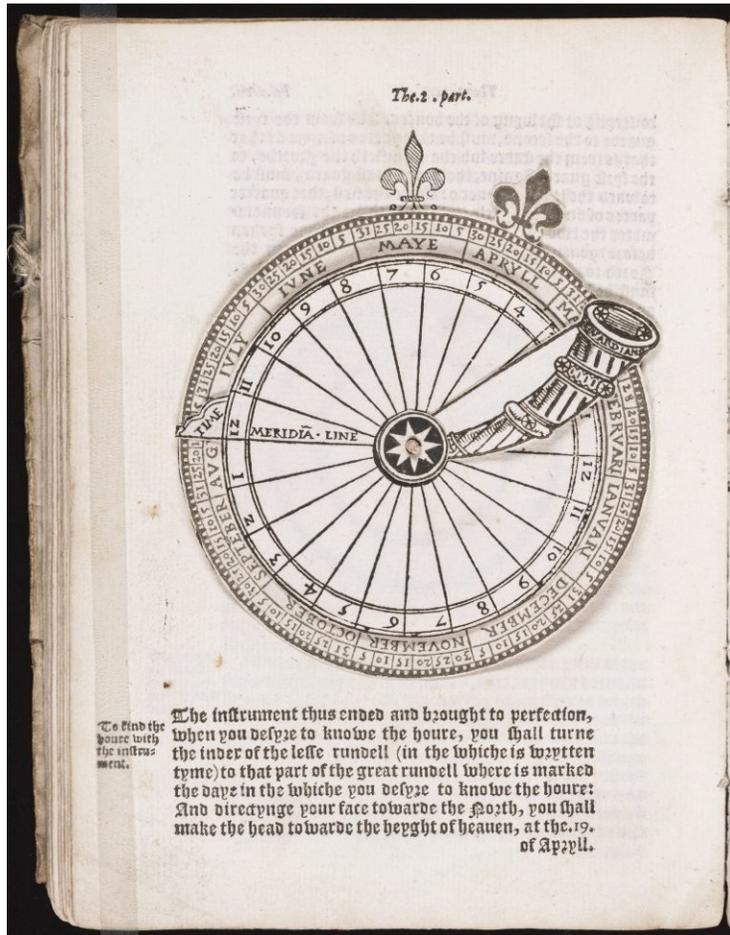
Figure seven: Volvelle, from Martin Cortes, *The arte of nauigation, conteynyng a compendious description of the sphere, with the makyng of certen instruments and rules for nauigations* ([London], 1561). Beinecke Library Taylor 129. By permission of the Beinecke Rare Book and Manuscript Library, Yale University.
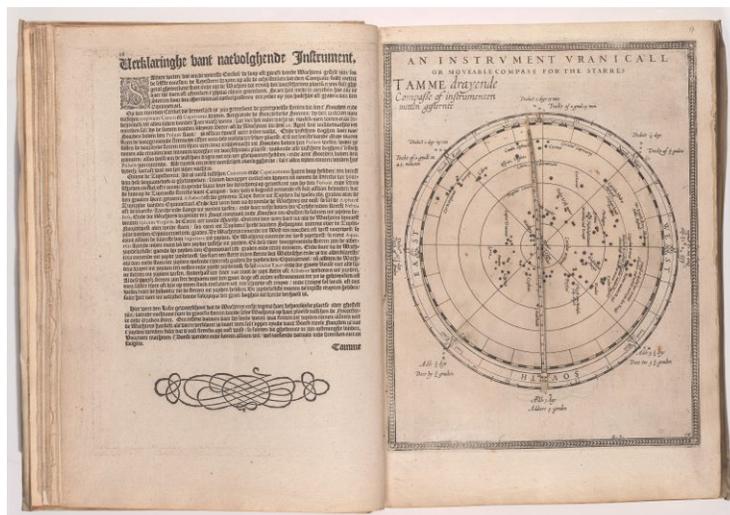

Figure eight: Volvelle from *The mariners mirrovr* ([Amsterdam]: Jodocus Hondius, 1605), pp. 16-17. Beinecke Library 1976 Folio 46. By permission of the Beinecke Rare Book and Manuscript Library, Yale University.

Figure nine: Volvelle, 'Sfera facile per trovare in ogni tempo sia passato presete…', from Antoni Carrarion, *Opera astrologica perpetva ridotta secondo la nvova riforma dell'anno* (Rome?, 1581). Beinecke Library 2004 Folio 20. By permission of the Beinecke Rare Book and Manuscript Library, Yale University.

Figure ten: Volvelle, 'Medianor, Meridies', from Peter Apian, *Cosmographicus liber Petri Apiani mathematici studiose collectus* ([Landshutae, 1524]). Beinecke Library Taylor 57. By permission of the Beinecke Rare Book and Manuscript Library, Yale University.
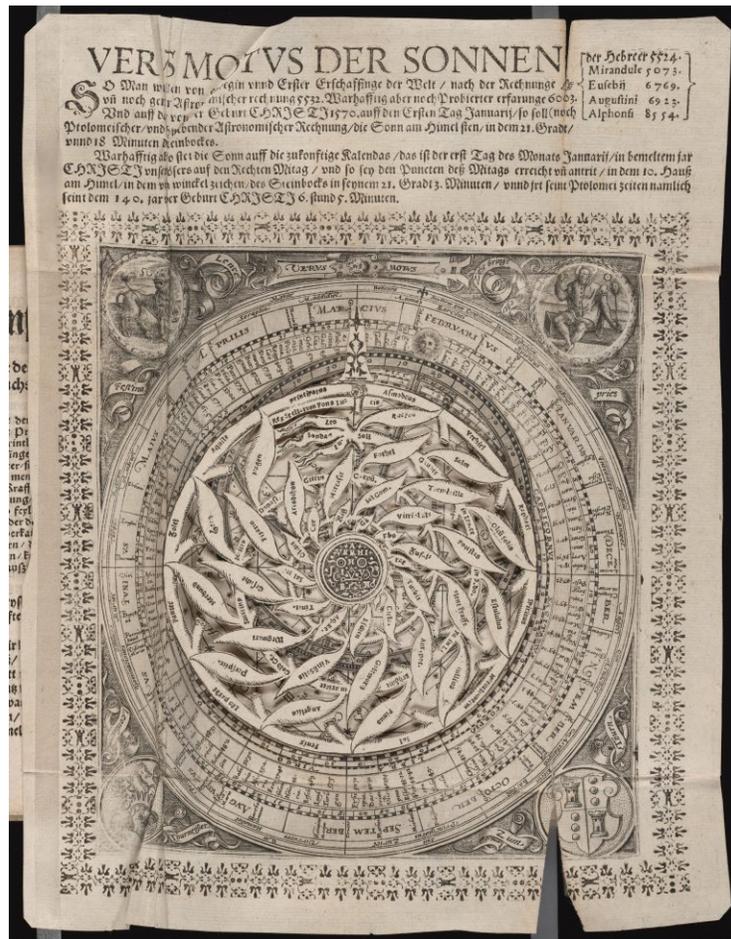
Figure eleven: 'Verus motus der sonnen', from Leonhard Thurneisser zum Thurn, *Archidoxa dorin der recht war Motus, Lauff vnd Gang, auch heymlikait, wirkung und krafft, der Planeten, Getirns, vnd gantzen Firmaments ...* (Munster in Westphalen: Johan Ossenbrug auff Verlegung H. Herr Leonhart Turneyssers zum Thurn, 1569). Beinecke Library Rs5 T42 569. By permission of the Beinecke Rare Book and Manuscript Library, Yale University.

Figure twelve: Unconstructed volvelle, from Giambattista della Porta, *De fvrtivis literarvm notis vvulgo* (Naples: Mariam Scotum, 1563). Beinecke Library Z44 2m. By permission of the Beinecke Rare Book and Manuscript Library, Yale University.

And numerous books, including Hooke's *Micrographia*, made use of the simple technology of the unfolding inserted leaf to offer readers maps and engravings on a large scale, or unfurl the intricacies of an expanding table, often based on the proliferating subdivisions of Ramist logic (figures thirteen, fourteen, fifteen).
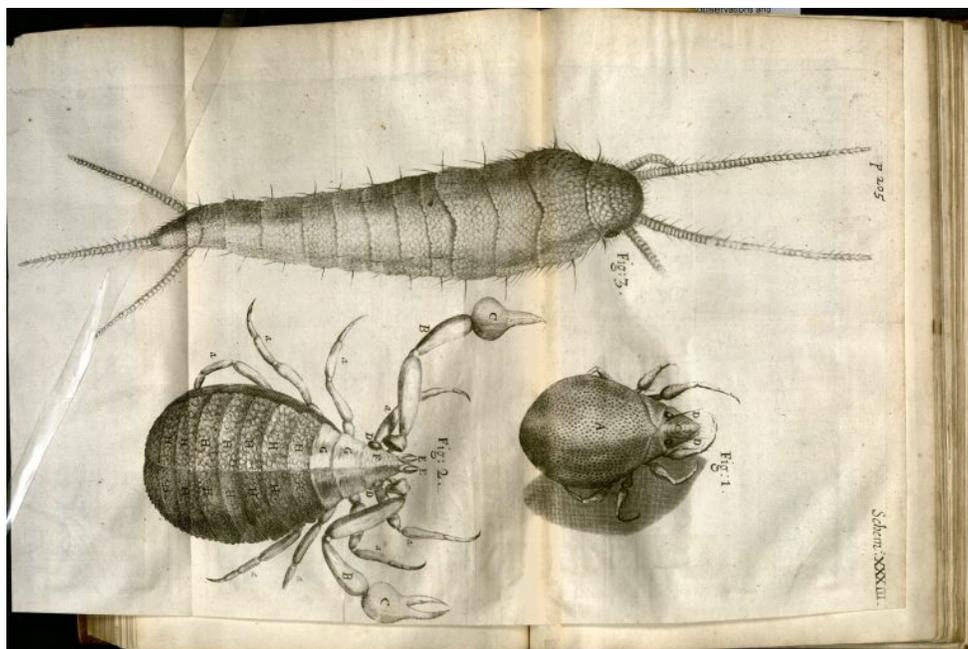

Figure thirteen: Robert Hooke, *Micrographia* (London: for John Martyn, printer to the Royal Society), foldout plate (Schema. XXXIII). Houghton Library EC65 H7636 665maa. Houghton Library, Harvard University.
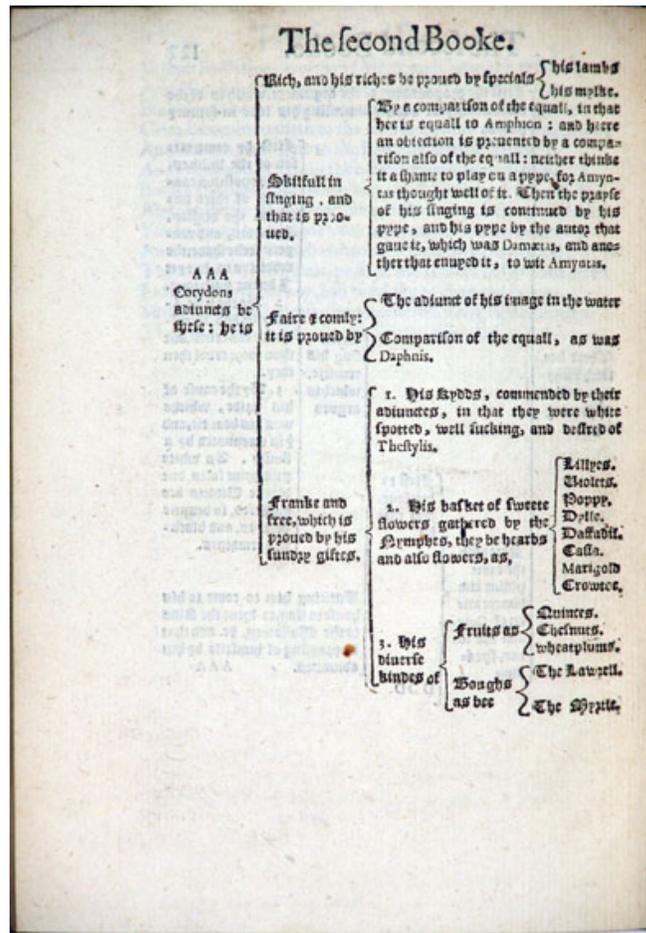
Figure fourteen: Folded table from Abraham Fraunce, *The lawiers logike* (London: William How for Thomas Gubbin and T. Newman, 1588). University of Chicago Library BC151.F84. Special Collections Research Center, University of Chicago Library.

Figure fifteen: Staphylus, Fridericus, *The apologie of Fridericus Staphylus counseeler to the late Emperour Ferdinandus* (Antwerp: John Latius, 1565), fold-out before sig. Hh1r. Folger Shakespeare Library STC 23230. Used under a Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0).

[42] Mathematicians too made use of the capacities of paper to fold, crease, slice and bow, in attempts to render complex abstractions concrete. In a guide to Euclidean geometry, Henry Billingsley insisted that 'when there is in Geometry mention made of pointes, lines, circles, triangles, or of any other figures, ye may not concyue of them as they be in matter, as in woode, in mettall, in paper, or in any such lyke … But you must concieue them in mynde, plucking them by imagination from all matter so shall ye vnderstande them truely and perfectly' (Euclid, 1570: B2^r). Nonetheless, Billingsley quickly turns to paper models to make the essentials of Euclidean geometry accessible to his readers:

> …if ye draw the like formes in matter that wil bow and geue place, as most aptly ye may do in fine pasted paper, such as pastwiues make womens pastes of, & then with a knife cut euery line finely …, if then ye bow and bende them accordingly, ye shall most plainly and manifestly see the formes and shapes of these bodies… [I]t shall be very necessary for you to have store of that pasted paper by you (Ss5^r).

Billingsley celebrates the flexibility of paper, and its ability, when cut and folded, to render in three dimensions what his diagrams constrained to two. At the same time, Billingsley's knowledge of the activities of paste-wives, along with his assumption that his readers will be intimately familiar with the moulded paper edges that supported fashionable headgear, blurs the distinction between the vogue for Euclidean geometry and the fashion for French hoods.

[43] The term 'pasted paper' occurs twenty-three times in Billingsley's instructions, suggesting how necessary the work of folding was to the geometrical imagination. Billingsley's instructions take the book out of itself, transforming a two-dimensional

problem into an easily understood three-dimensional solution. The book itself participates in this dynamic, offering up its pages for cutting and folding (figures sixteen and seventeen). Paper stands in, repeatedly, for the idea of the plane or surface; its cuttable, foldable properties make it an indispensable tool for materialising problems as well as a conceptual tool for extrapolating ideas which attempt to go beyond the limits of matter.
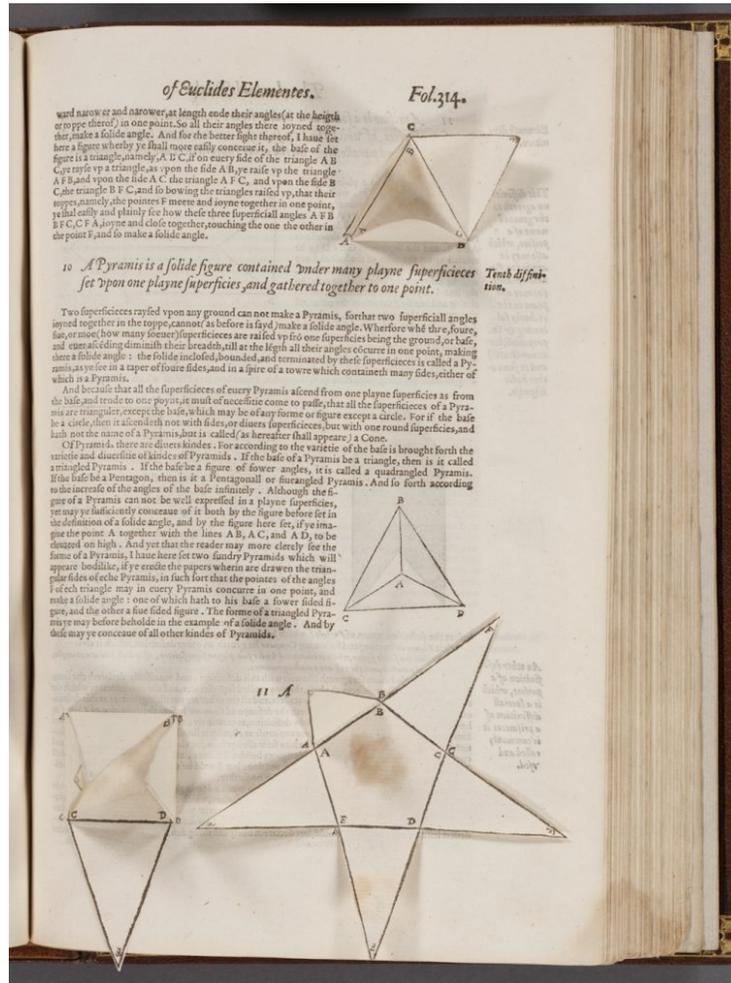

Figure sixteen: Henry Billingsley, *Elements of Euclid* (London: John Day, 1570), Rr5r. B515 Eu3211, Rare Book & Manuscript Library, Columbia University in the City of New York.

Figure seventeen: Henry Billingsley, *Elements of Euclid* (London: John Day, 1570), Rr5r.
Image courtesy of History of Science Collections, University of Oklahoma Libraries.

Tricks and Toys

[44] Immediately after his encomium to paper in the *Novum organum*, Bacon reflects: 'Again, among Instances of Ingenuity or of the Hand of Man, we must not entirely despise tricks and juggling. For some of them, though their use be trivial and playful, can still provide sound information' (305). Solemn as Bacon's tone may be, his reflection points to the degree to which the inventive paper practices described above shared common ground with ingenious entertainments and child's play in their propensity to multiply the surfaces of paper through folding, creasing, rolling, cutting and moulding.

[45] Numerous sources suggest the widespread use of paper as a children's plaything. To investigate the consistency of colours, Walter Charleton tells the reader of his *Physiologia Epicuro-Gassendo-Charltonia* to 'fold the Cloth, as Boyes do paper for Lanterns' (1654: Bb1^{v}); John Aubrey recalls a chalk-pit discovered by a boy who fell down it while chasing a paper kite (3.284); and Michael Drayton describes a personified world sitting with a lap full of 'paper Puppets, Gawdes and Toyes, / Trifles scarce good enough for Girles and Boyes' (V3^{r}). Michel de la Serre writes of 'castles of paper and cards, such as little children lodge their pety cares in' (1639: H3^{r}), and Bosola, in *The Duchess of Malfi*, despises bodies as 'weaker then those / Paper prisons boyes vse to keepe flies in' (1623: K1^{r}). In *The Countesse of Montgomeries Urania*, Mary Wroth describes an errant ship: 'vnguided she was, vnrul'd, and vnman'd, tumbling vp and downe, like the Boates boyes make of paper' (1621: Lll3^{r}). Thomas Edwards dismissed one attack on *The second part of Gangraena* as 'a lance of brown painted paper, fit for children to play with' (1646: Z2^{r}), whilst Thomas Brown described children 'making Durt-pyes, and snipping Paper' (1690: E4^{v}). And in a prefatory poem praising William D'Avenant's Madagascar, Endimion Porter describes having seen

> ...a childe with Sissors cut,
> A folded Paper, unto which was put
> More chance, than skill, yet when you open it,
> You'd thinke it had beene done, by Art and Wit: ([1638: A3^{v}])

Whilst Porter's poem explicitly contrasts childish 'chance' with a mature 'Art and Wit', an attention to the pleasures of paper-folding prompts us to think differently about the sensuous delights of intricate engagements with paper, from building geometrical models or

paper instruments to the complex series of folds needed to close a letter ('Letterlocking'). A seventeenth-century painting, in the style of Jacob Toorenvliet, shows four observers (women and men, children and adults) appreciating a delicate toy, designed to twist and turn in the breeze (figure eighteen).

Figure eighteen: 'Watching a paper wind toy', style of Jacob Toorenvliet 1640-1719), last quarter of the seventeenth century, British Optical Association Museum, LDBOA1999.178. © The College of Optometrists, London.

The figure in the foreground is pinching a pleated object between two fingers, probably a paper fan used to set the model moving. Letters around the edge of the model read 'MEMENTO MORI' and repeat the message in Dutch ('GEDENCK TE STERV[EN]'), reminding the viewer that she is as fragile as this trembling globe.[7]

[46] Women were expert proponents of the paper arts. Wolley offers a veritable encyclopaedia of decorative paper-work, from decoupage to scroll-work. In the 1630s, Edmund Waller complimented 'the Lady Isabella Thynn on Her exquisite Cutting trees in paper' in a poem which plays on the blank-paper trope, claiming Thynn's art in cutting as a kind of 'writing' that can engage with 'Virgin paper' 'Yet from the stayne of inke preserve it white'. In full flattering mode, Waller distinguishes Thynne's art from that of the writer or painter, collapsing the boundaries between artifice and nature in a quasi-blasphemous compliment:

> For though a paynter boughs and leaves can make
> Tis you alone can make 'um bend, and shake
> Whose breath salutes their new Created grove
> Like southerne windes, and gently makes it move (MS Rawl Poet 84, 113^v-r).**[8]**

William Hicks' 1673 *London Drollery* includes another poem in praise of paper-clipping, complimenting 'Madam E.C' 'Upon her Curious Art in Cutting Figures in Paper; and other her Artificial Curiosities'. Drawing upon the conceit of an art that exceeds nature, Hicks suggests: 'one would think your very Flowers do grow: / So well they're cut, by your ingenious hand' (D8^v).), and 'With the Clipping Tool, You to life do bring / To th' Eye those things which seem inanimate' (E1^r).). Whilst Hicks' emphasis is upon his addressee's ingenious skill, both he and Waller are alert to the animacy of cut paper: its trembling responsiveness to its environment.

[47] Matthew Hunter opposes Madam E. C.'s awe-inspiring cutting to Hooke's micrometer, arguing for the latter as a form of 'materialized intelligence' thanks to its ability to 'solve puzzles and also undermine its own authoritative structure, prompting and stimulating new imaginings' (2013: 550). Yet Hicks' poem is testimony to its subject's ability to stimulate 'new imaginings', and explicitly says that E. C.'s cut paper entrances the natural philosopher: 'When *Curiosoes* see 'em, they're at a stand'. The 'curioso' is the man of science, 'an admirer or collector of curiosities; a connoisseur, virtuoso' (*OE*D, 'curioso, n.'). Waller's poem also appears alongside a number of Restoration poems in a miscellany of papers belonging to John Locke (Locke e.17), suggesting the philosopher's interest in Thinn's as well as Waller's craft. Women's paper-cutting was thus located within a realm of virtuosic play that blurred the bounds of nature and art.

[48] Various writers celebrated the ingenuity of paper arts. In 1661, Thomas Powell celebrated the 'pretty Art' of 'a pleated paper' in which 'men make one picture to represent several faces' (G6^v). The fold or pleat offers the promise of simultaneous concealment and revelation, as well as what a modern-day paper practitioner describes as the 'satisfying, rhythmic, repetition of light and shade' (Jackson, 2011: 55), linking to the early modern fascination with perspective and optical illusion. A 1676 volume of *Sports and Pastimes* offered its users instructions for 'A sheet of Paper called Trouble-wit': 'a very fine invention, by folding a sheet of Paper, as that by Art you may change it into twenty-six several forms or fashions' (J. M., F2^v; figure nineteen).
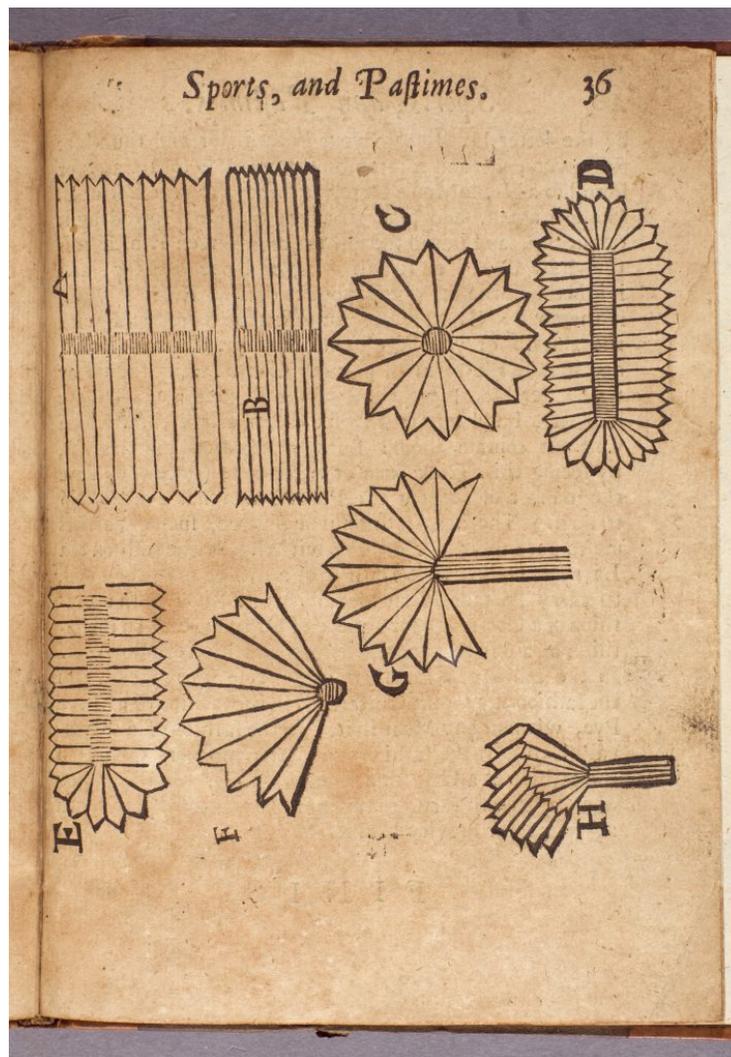
Figure nineteen: J. M., *Sports and pastimes: or, Sport for the city, and pastime for the country; with a touch of hocus pocus, or leger-demain* (London: H. B[rugis] for John Clark, 1676), F3r. Huntington Library Rare Books 64667.

Situated just before a table of contents which includes such gems as 'To make sport with an Egg', 'To fox Fish', and 'To make one laugh till the tears stand in his eyes', the 'trouble-wit' explicitly declares itself part of the ephemeral world of play. J. M.'s terms of 'art', 'wit', 'invention', and 'ingenuity' bring paper into the realm of the mechanical but also the marvellous. In its proliferation of surfaces, the trouble-wit troubles the surface of the page, inviting readers to imagine a book extending beyond itself in artfully elaborated folds.

[49] Like several of the examples describe above, *Sports and Pastimes* draws our attention to the book as a technology of folded paper. Half-way down page 40, J.M. apologises that his illustrations come to an abrupt end, leaving the keen maker to work out for herself exactly how to shape the paper into 'the fashion of a Court Custard' or 'a Carriadge for a piece of Ordinance'. Explaining that he would have supplied the rest, J. M. complains 'I am tied to six sheets at present, which will not contain them'. The folded and stitched paper of the codex is revealed to be considerably less flexible than the trouble-wit whose material nonetheless insists upon its continuity with the book's pages. Yet perhaps this restriction might be generative, leaving open the imaginative possibilities of the fold. Derrida, writing about the ways in which the changed support for writing offered by the word processor changes the lines of his thought, concludes that his typographical experiments were

precisely a product of his material: 'without those constraints of paper—its hardness, its limits, its resistance—I wouldn't have *desired* them' (47).

[50] A 1649 collection of *Naturall and artificiall conclusions ... with a new addition of rarities, for the practise of sundry artificers*, plays with the line between nature and art in more disturbing ways. Among other 'diverting' experiments, it offers instructions to 'make of paper a Bird, Frog, or other artificial creature, to creep on the ground, flee, or run upon a wall or post': 'Take a piece of Paper, and cut it with a knife or cizers into the form of the Figure before ... and stick thereon a Fly, Beetle, or what other such small voluble creature you shall think fit: and you shall hereupon behold a very pretty conceited motion' (Hill, G2^r). As horrid as this hybrid seems to the contemporary reader, Hill's title language of the 'natural and artificial', as of 'rarities' and 'artificers', places it firmly in the realm of the wonderful, influentially described by Lorraine Daston and Katharine Park (2001).

[51] Paper even found its way into the *Wunderkammer*, that space which R. J. W. Evans and Alexander Marr describe as 'the emblem par excellence of early modern curiosity and wonder' (2006: 10). Paula Findlen describes how books both stood in for and were incorporated into curiosity cabinets (1996: 29, 49, 59-60, 67-8), whilst paper was used to label and support objects. In his catalogue of the 'natural and artificial rarities' belonging to the Royal Society, Grew included 'The WEB of a *Bermuda-Spider* ... wound upon a Paper like Raw-Silk' (1681: Z3^v), and 'The WATER-SCORPION', which, he explained, was almost impossible to describe, it 'being glewed to a Paper with the Belly upward' (Z4^v). Paper itself became an object of curiosity: John Tradescant's catalogue of his collections (eventually the foundation of the Ashmolean Museum) lists a series of

Landskips Stories— Trees— Figures—	}	cut in Paper by some of the Emperours

Indian paper made of	{	-Grasses. -Straw. -Rinds of trees. (D5^r)

Grew, in turn, lists shells used 'for the polishing of Paper' (T1^v), and bee and wasp nests, consisting 'of the small *Fibers* of Plants, cohering, altogether as in *Paper*; as may be seen by a Glass. So that the *Stuff* may not be improperly called *BEE-PAPER*' (Y2^r), 'An Example of the CHINA-Language ... upon two sorts of *China* Papyr' (Ccc1^r), samples of 'Paper or Pastboard-Money' (Ccc4^v) and 'A FORREST, with a House at the end of it; and several Beasts both wild and tame, as the *Lion, Unicorne, Boar, Camel, Stag*, and a *Dog* pursuing him: all Cut in PAPYR, in the compass of about three inches square' (Ccc1^v-Ccc2^r). In these examples, paper becomes an example both of nature (the bees' nest; papyrus) and of exquisite art. Grew's catalogue was published by subscription; in an advertisement issued in

1680, Grew promised that 'whoever Subscribeth for Six *English* Copies in Quires … shall receive seven such Copies … upon very good Paper'.

***

[52] It seems fitting to conclude with the period's greatest poet of paper, John Taylor. *Apollo shrouing*, a comedy composed for the scholars of the free school at Hadleigh in Suffolk, celebrates, if satirically, the boat Taylor crafted from brown paper in 1619 in an attempt to row from London to Quinborough in Kent. When Drudo laments, of Taylor, 'Would we had him in Parnassus. Hee would stroake our Mistresses the Muses gently with his oare, and make their worships very merry, with his paper Wherry', Lawriger responds: 'Paper Wherry? you meane by a metaphor, that his papers and verses carry a mans attention as smooth as a wherry'. 'No', replies Drudo, 'I meane his sayling in a Paper Boate' (Hawkins, 1627: B8[r]). Posing the question of whether 'we can still talk about such a thing' as 'actual paper', Derrida asks 'Can we speak here about paper *itself*, about the "thing itself" called "paper"—or only about figures for it?' (50). Drudo's bathetic collapse of Lawriger's high-flying, or rather high-floating, metaphor bluntly asserts the presence of 'actual paper' in the midst of figuration.

[53] Paper's propensity to be folded, creased, cut, crumpled and moulded calls into question our routine insistence upon seeing the page or sheet as surface, and of conceiving of paper strictly within the terms of the graphosphere. This article opened with Hall's appealing aphorism: 'Materials are materials because inventive people find ingenious things to do with them' (2014: xiii). Ingenious people certainly did do inventive things with early modern paper, but they were able to do so because of its material properties: properties which were a source of philosophical and literary speculation, and practical use. 'It is from the particularities of substances', Hall goes on to say, 'that uses arise' (1). Taking account of paper's propensity to be fashioned, to re-present or imitate a rich range of forms and functions, encourages us to think again about the matter of the surface: its durability, its ephemerality, and its transformations.

University of York

NOTES

[1] Warm thanks to audiences at Lancaster, Cambridge and the IHR for their comments on earlier versions of this article, and to participants at the 'Size Matters' workshop at the Centre for Editing Lives and Letters, whose insights and expertise informed this 'paper' in its final stages. Thanks too to the anonymous reviewers for *Journal of the Northern Renaissance* for their thoughtful comments.**[back to text]**

[2] In quantitative terms, this translates to just over 2.2 sheets of white paper per head of the English population (though distribution was markedly uneven), alongside an undetermined quantity of imported brown paper, domestically-produced paper, and paper which persisted from previous years. In 1699, a 'bundle' was defined as two reams of paper; however, the size of a bundle prior to that date is not clear, and it is plausible that the 1699 figure was part of a project of regularisation, rather than an accurate reflection of quantities. In 1659, the translator of Comenius's *Orbis sensualium pictus* instructed readers that twenty-five sheets made a quire, '*twenty quires* a Ream, *and ten of these* a Bale of Paper' (N7[r]).**[back to text]**

[3] Elaine Leong also cites this receipt in a recent blog post: **https://blog.shakespearesworld.org/tag/margaret-baker/ [back to text]**

[4] For the standard accounts of English papermaking, see Coleman, esp. 40-88; Hills, esp. chapters one and four; Hunter, esp. 114-20; 224-57.**[back to text]**

[5] Heather Wolfe and Henry Woudhuysen are currently undertaking research into the uses of Spilman's paper; see **http://collation.folger.edu/2014/02/an-example-of-early-modern-english-writing-paper/**. **[back to text]**

[6] Thanks to Kate Loveman for drawing this experiment to my attention.**[back to text]**

[7] I am grateful to Sjoerd Levelt and Freya Sierhuis for their help in deciphering this puzzle.**[back to text]**

[8] Thanks to Claire Canavan for drawing this poem to my attention. Variants appear in BL Add. MS 70454, f. 50^v (the last two lines), Yale fb. 228/58 ('Of a fair lady that cut free in paper'), U. Leeds, Brotherton Lt 36, f. 33^v ('Of a tree cut in paper'), All Souls, Oxford, Codrington MS 174, p. 237 ('The Lady Isabella Thynne on her exquisite cutting trees in paper'), Huntington Library HM11619 ('To the Lady Isabella Thynne on her exquisite cutting trees in paper'), Bodley Rawl poet 116, f. 64 ('Waler to a Lady who sent him a Groue of trees cut out in white Paper'), Bodley Locke e.17, p. 80 ('To my Lady Isabella Thinn cutting trees in paper.'), and Bodley Ashmole 1819, between no. 22 and no. 23 ('Of cutting Trees in Paper, by the Lady Isabella Thynn, daughter of ye Earle of Holland.'), which records: 'These verses I had from my Lady Dorothy Long of Dracot-Cerne(?) 1656. Her Lap. had severall other Copies of Mr Waller, wch he had not copy of, wch she lent(?) to ye Dutchesse of Beaufort at Badminton, which were never return'd'.**[back to text]**

WORKS CITED

Manuscripts

Bodleian Library
MS Rawl Poet 84

Folger Shakespeare Library
MS V.a.8, Cookbook of L. Cromwell
MS V.a.468, fol. 78^{r-v}, Cookbook of Elizabeth Fowler (fl. 1684)

National Archives
C 66/1331
PC 2/19
PC 2/24
SP 1/242
SP 12/185
SP 12/217
SP 12/276
SP 12/279
SP 12/282
SP 16/403
SP 16/438

SP 63/156
SP 63/165

Printed Primary Sources

Place of publication is London, unless otherwise stated.

Anon. 1655. *Samuel Hartlib, his legacy of husbandry … third edition* (J. M. for Richard Wodnothe)

Aubrey, John. 1718-1719. *The Natural History and Antiquities of the County of Surrey*, 5 vols (for Edmund Curll)

Bacon, Francis. 2004. *The* Instauratio magna *Part II:* Novum organum *and Associated Texts*, ed. and trans. by Graham Rees with Maria Wakely (Oxford: Clarendon Press)

Barrough, Philip. 1583. *The methode of phisicke* (Thomas Vautrollier)

Bartholomaeus, Anglicus. 1495. *Bartholomeu[s] de proprietatib[us] re[rum]* (Westminster: Wynkyn de Worde)

Basilius, Valentinus. 1670. *Of natural & supernatural things*, trans. by Daniel Cable (Moses Pitt)

Bate, John. 1634. *The mysteryes of nature, and art* (for Ralph Mab)

Baxter, Richard. 1650. *The Saints Everlasting Rest* (Robert White for Thomas Underhil and Francis Tyton)

Blackwood, Christopher. 1654. *Some pious treatises* (for Giles Calvert)

Blagrave, John. 1585. *The mathematical ievvel* (by Walter Venge)

Blagrave, Joseph. 1674. *Blagrave's supplement or enlargement to Mr. Nich. Culpeppers English physitian* (for Obadiah Blagrave)

Blundeville, Thomas. 1617. *The arte of logick* (William Stansby, sold by Matthew Lownes)

Bonham, Thomas. 1630. *The chyrurgians closet* (George Miller for Edward Brewster)

Boyle, Robert. 1669. *A continuation of new experiments physico-mechanical* (Oxford: Henry Hall for Richard Davis)

Boyle, Robert. 1692. *Medicinal experiments* (for Sam. Smith)

Breton, Nicholas. 1607. *Wits priuate wealth* (Edward Allde for John Tappe)

Brown, Thomas. 1690. *The late converts exposed* (for Thomas Bennet)

Browne, David. 1622. *The new invention, intituled, calligraphia* (Saint Andrews: Edward Raban)

C., T. 1578. *An hospitall for the diseased* (for Thomas Man and William Hoskins)

Charas, Moyse. 1678. *The royal pharmacopoea* (for John Starkey and Moses Pitt)

Charleton, Walter. 1654. *Physiologia epicuro-Gassendo-Charltoniana* (Thomas Newcomb for Thomas Heath)

Churchyard, Thomas. 1588. *A Sparke of Frendship and Warme Goodwill … Whereunto is ioined, the commoditie of sundrie Sciences, the benefit that paper bringeth* ([Thomas Orwin])

Comenius, Johann Amos. 1659. *Joh. Amos Commenii Orbis sensualium pictus*, trans. by Charles Hoole (for J. Kirton)

Cooper, Thomas. 1565. *Thesaurus linguae Romanæ & Britannicæ* (Thomas Berthelet)

Cowley, Abraham. 1650. *The guardian* ([Thomas Newcombe] for John Holden)

d'Audiguier, Vital. 1627. *A tragic-comicall history of our times, under the borrowed names of Lisander and Calista* (H. L. for George Lathum)

D'Avenant, William. 1638. *Madagascar* (John Haviland for Thomas Walkly)

Dawson, Thomas. 1587. *The good huswifes Iewell* (John Wolfe for Edward White)

Drayton, Michael. 1627. *The battaile of Agincourt* (for William Lee)

Edwards, John. 1665. *The plague of the heart* (Cambridge: John Field for Edmund Beechinoe)

Edwards, Thomas. 1646. *The third part of Gangraena* (for Ralph Smith)

England and Wales. 1650. *An Act for the Redemption of Captives* (n.d; n.p.)

Euclid. 1570. *The elements of geometrie*, trans Henry Billingsley (John Day)

Ford, Edward. 1641. *A designe for bringing a navigable river* (for John Clarke, 1641)

G., T. 1616. *The rich cabinet* (I. B. for Roger Jackson)

Goedaert, Johannes. 1682. *Of insects* (York: John White for M. L.)

Grew, Nehemiah. 1680. *Whereas a book entituled…* (s.l., s.n.)

Grew, Nehemiah. 1681. *Musaeum regalis societatis* (W. Rawlins for the Author)

Hawkins, William. 1627. *Apollo shrouing* (for Robert Mylbourne)

'Henry VIII: May 1526, 1-15'. *Letters and Papers, Foreign and Domestic, Henry VIII, Volume 4, 1524-1530,* ed. by J. S. Brewer (Her Majesty's Stationery Office, 1875), pp. 956-974.

'Henry VIII: May 1527, 6-10'. *Letters and Papers, Foreign and Domestic, Henry VIII, Volume 4*, 1524-1530, ed. by J. S. Brewer (Her Majesty's Stationery Office, 1875).

'London Port Book, 1567-8 '. 1972. *The Port and Trade of Early Elizabethan London: Documents*, ed. by Brian Dietz (London Record Society, 14)

Hicks, William. 1673. *London drollery* (F. Eglesfield)

Hill, Thomas. 1649. *Natvurall and artificiall conclvsions* (by Jane Bell)

Hooke, Robert. 1665. *Micrographia* (John Martyn and James Allestry)

Huarte, Juan. 1594. *The examination of mens vvits, trans R. C.* (Adam Islip)

Jones, John. 1579. *The arte and science of preseruing bodie and soule* (Henry Bynneman)

Kent, Elizabeth Grey, Countess of. 1653. *A choice manual of rare and select secrets* (R. Norton)

Kepler, Johannes. 1938-. *Johannes Kepler: Gesammelte Werke*, ed. by Max Caspar et al, vol. 13 (Munich: C. H. Beck)

Lémery, Nicolas. 1686. *A course of chymistry* (R.N. for Walter Kettilby)

Lupton, Thomas. 1579. *A thousand notable things* (John Charlewood for Hugh Spooner)

Locke, John. 1693. *Some thoughts concerning education* (for A. and J. Churchill)

M., J. 1676. *Sports and pastimes* (H. B. for John Clark)

N., S. [Sylvester Norris], 1622. *An antidote or treatise of thirty controuersies* (Saint-Omer: English College Press, 1622)

Norden, John. 1593. *Speculum Britanniae. The first parte* ([Eliot's Court Press])

Oughtred, William. 1652. *Dialling performed instrumentally by our hemisphere* (by William du-Gard and are to be sold by William Hope)

Paré, Ambroise. 1634. *The workes of that famous chirurgion Ambrose Parey*, trans. by Thomas Johnson (Th. Cotes and R. Young)

Pepys, Samuel. 1970-. *The diary of Samuel Pepys: A New and Complete Transcription*, ed. by Robert Latham and William Matthews, 11 vols (London: Bell)

Plat, Hugh. 1602. *Delightes for ladies* (Peter Short)

Powell, Thomas. 1661. *Humane Industry* (for Henry Herringman)

Rogers, Nehemiah. 1632. *A sermon preached at the second trienniall visitation* (George Miller for Edward Brewster)

Royal Society. 1809. *The Philosophical Transactions of the Royal Society of London*, vol. 1, ed. Charles Hutton, George Shaw and Richard Pearson (C. and R. Baldwin)

Ruscelli, Girolamo. 1562. *The thyrde and last parte of the Secretes of the reuerende Maister Alexis of Piemont*, trans. by William Ward (Rowland Hall for Nicholas England)

Salmon, William. 1672. *Polygraphice* (E. T. and R. H. for Richard Jones)

Scotland. Commissioners of Customs. 1611. *The Rates of Marchandizes* (Edinburgh: Thomas Finlason)

Scotland. 1657. *A Book of Values of Merchandize Imported* (Edinburgh: Re-printed by Christopher Higgins)

Serre, Michel de la. 1639. *The mirrour which flatters not* (E[lizabeth] P[urslowe] for R. Thrale)

Shakespeare, William. 1622. *The tragœdy of Othello, the Moore of Venice* (Nicholas Okes for Thomas Walkley)

Shakespeare, William. 1623. *Mr. William Shakespeares comedies, histories, & tragedies* (Isaac Jaggard and Edward Blount)

Taylor, John. 1620. *The praise of hemp-seed* (for Henry Gosson)

Topsell, Edward. 1607. *The historie of foure-footed beastes* (William Jaggard)

Tradescant, John. 1656. *Musaeum Tradescantianum* (John Grismond, sold by Nathanael Brooke)

Twisse, William. 1653. *The riches of Gods love* (Oxford: L. L. and H. H. for Tho. Robinson)

Vallans, William. 1590. *A tale of two swannes* (Roger Ward for John Sheldrake)

Vaughan, Henry. 1655. *Silex Scintillans: Sacred Poems and private Ejaculations. The second Edition, In two Books* (for Henry Crips and Lodowick Lloyd)

Vesalius, Andreas. 1543. *De humani corporis fabrica librorum epitome* (Basel: Johann Oporinus)

Webster, John. 1623. *The tragedy of the Dutchesse of Malfy* (Nicholas Okes for John Waterson)

Wolley, Hannah. 1674. *A supplement to The queen-like closet* (for Richard Lowndes)

Wolley, Hannah. 1677. *The compleat servant-maid* (for T. Passinger)

Wroth, Mary, Lady. 1621. *The Countesse of Montgomeries Urania* ([Augustine Matthews?] for John Marriott and John Grismand)

Secondary Sources

Calhoun, Joshua. 2011. 'The Word Made Flax: Cheap Bibles, Textual Corruption, and the Poetics of Paper'. *PMLA* 126: 327-44

Cohen, Jeffrey Jerome. 2015. *Stone: An Ecology of the Inhuman* (Minneapolis: University of Minnesota Press)

Coleman, D. C. 1958. *The British Paper Industry, 1495-1860: A Study in Industrial Growth* (Oxford: Clarendon Press)

Daston, Lorraine J. and Katharine Park. 2001. *Wonders and the Order of Nature, 1150-1750* (Cambridge, MA: MIT Press)

Dent, John. 1962. *The Quest for Nonsuch* (London: Hutchinson)

Derrida, Jacques. 2005. *Paper Machine*, trans. by Rachel Bowlby (Stanford, CA: Stanford University Press)

Evans, R. J. W., and Alexander Marr, eds. 2006. *Curiosity and Wonder from the Renaissance to the Enlightenment* (Aldershot: Ashgate)

Findlen, Paula. 1996. *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Oakland, CA: University of California Press)

Fleming, Juliet. 2013. 'Damask Papers', in Andy Kesson and Emma Smith, eds. *The Elizabethan Top Ten: Defining Print Popularity in Early Modern England* (Aldershot: Ashgate), pp. 179-92.

Fleming, Juliet. 2016. *Cultural Graphology: Writing After Derrida* (Chicago: University of Chicago Press)

Gavin, John. 2012. *Papermaking and Printing in Cumbria 1600-1900*, Studies in British Paper History, Volume 3

Grazia, Margreta de and Peter Stallybrass. 1993. 'The Materiality of the Shakespearean Text'. *Shakespeare Quarterly* 44: 255-83

Green, Mary Anne Everett. 1858. *Calendar of State Papers Domestic: James I, 1611-18* (London: Her Majesty's Stationery Office)

Green, Mary Anne Everett. 1869. *Calendar of State Papers Domestic: Elizabeth, 1595-97* (London: Her Majesty's Stationery Office)

Hall, Christopher. 2014. *Materials: A Very Short Introduction* (Oxford: Oxford University Press)

Hills, Richard L. 1988. *Papermaking in Britain, 1488-1988: A Short History* (London and Atlantic Highlands, NJ: The Athlone Press)

Hunter, Dard. 1947. *Papermaking: The History and Technique of an Ancient Craft*, 2nd ed. (rpt New York: Dover Publications, Inc., 1978)

Hunter, Matthew C. 2013. 'Picture, Object, Puzzle, Prompter: Devilish Cleverness in Restoration London'. *Art History* 36: 546-67

Jackson, Paul. 2011. *Folding Techniques for Designers: From Sheet to Form* (London: Laurence King Publishing)

Jenkins, Rhys. 1958. *Paper-making in England, 1495-1788* (London: Association of Assistant Librarians)

Karr, Suzanne. 2004. 'Constructions Both Sacred and Profane: Serpents, Angels, and Pointing Fingers in Renaissance Books With Moving Parts'. *The Yale University Library Gazette* 78: 101-27

Knight, Leah. 2009. *Of Books and Botany in Early Modern England: Sixteenth-Century Plants and Print Culture* (Farnham: Ashgate)

Leong, Elaine. 2013. 'Paper slips, notebooks and health management', presentation at the University of Cambridge, **http://sms.cam.ac.uk/media/1482724**

Luker, Brian. 2009. 'Paper and Papermakers around Wells': *Somerset Archaeology and Natural History* 153: 115-22.

Müller, Lothar. 2014. *White Magic: The Age of Paper*, trans. by Jessica Spengler (Cambridge: Polity Press)

Pollard, Mary. 2000. *A Dictionary of Members of the Dublin Book Trade 1550-1800* (London: Bibliographical Society)

Shorter, Alfred H. 1957. *Paper Mills and Paper Makers in England, 1495-1800* (Paper Publications Society, Hilversum)

Thomson, Alistair G. 1974. *The Paper Industry in Scotland 1590-1861* (Edinburgh: Scottish Academic Press)

Wall, Wendy. 2016. *Recipes for Thought: Knowledge and Taste in the Early Modern English Kitchen* (Philadelphia: University of Pennsylvania Press)

Wilson, Graham A., Amanda P. Field, and Susannah Fullerton. 2002. 'The Big Brown Eyes of Samuel Pepys'. *JAMA Ophthalmology* 120: 969-75.

Web

Barrett, Timothy. 2012. 'Paper Through Time: Nondestructive Analysis of 14th- Through 19th-Century Papers. **http://paper.lib.uiowa.edu/european.php#sizing**.

'Letterlocking'. **http://www.janadambrogio.com/letterlock/#letterlocking-format-catgories**

Timmermann, Anke. 2013. 'Of Dirty Books and Bread', **http://recipes.hypotheses.org/2859**

V&A. 'Caring for Your Books & Papers', http://www.vam.ac.uk/content/articles/c/caring-for-your-books-and-papers/

Wolfe, Heather. 2014. 'An Example of Early Modern English Writing Paper'. **http://collation.folger.edu/2014/02/an-example-of-early-modern-english-writing-paper**