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MANUSCRIPT PRODUCTION IN ICELAND
A State of Knowledge[1]

Traditionally, the methods of book production in medieval Iceland were regarded as largely comparable to European practices, while materials were thought to have been primarily sourced from local resources. Increasingly, these assumptions are being replaced by results from detailed codicological studies.[2] Considerable research has been conducted in recent years on the specifics of Icelandic manuscripts, and several projects are still underway.[3] This article brings together findings from individual studies on the materiality of pre-modern Icelandic books, with the aim of synthesizing the growing understanding of their distinctive features and the particular nature of manuscript production in Iceland. Moreover, such an overview makes it possible to identify both well-covered research areas and remaining knowledge gaps.

1 This article was inspired by my chapter "Manuscript Production and Writing Culture in Iceland," *World in Words: A Manuscript Exhibition in Edda*, ed. Þórdís Edda Jóhannesdóttir (Reykjavík: Stofnun Árna Magnússonar í íslenskum fræðum, 2024), 94–103. Due to the amount of recent research on the topic, I felt the need to provide proper references as well as to deepen the discussion for a scholarly audience. Thanks are due, for helpful feedback and fruitful conversations, to Giulia Zorzan, Guðrún Harðardóttir, Lea D. Pokorny, Soffía Guðný Guðmundsdóttir, Tiffany Nicole White, Þórdís Edda Jóhannesdóttir as well as the two peer reviewers.

2 Már Jónsson was one of the pioneers of codicology in Iceland, in particular *quantitative codicology*, gathering and comparing codicological data of many manuscripts. See e.g. Már Jónsson, "Megindlegar handritarannsóknir," Ezio Ornato, *Lofræða um handritamergð: Hugleiðingar um bóksögu miðalda*, trans. Björg Birgisdóttir and Már Jónsson (Reykjavík: Sagnfræðistofnun Háskóla Íslands, 2003), 7–34; "Manuscript Design in Medieval Iceland," *From Nature to Script: Reykholt, Environment, Centre, and Manuscript Making*, eds. Helgi Þorláksson and Þóra Björg Sigurðardóttir (Reykholt: Snorrastofa, Cultural and Medieval Centre, 2012), 236–237.

3 For a general overview of recent trends in Icelandic manuscript studies see e.g. Emily Lethbridge, "Manuscript and Textual Culture," *The Cambridge History of Old Norse-Icelandic Literature*, eds. Heather O'Donoghue and Eleanor Parker (Cambridge: Cambridge University Press, 2024), 44–49.

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Manuscript production in Iceland formed part of the wider Western tradition. With its origins in European writing culture, the making of books in pre-modern Iceland followed the same basic stages as elsewhere:

1. *The writing support*, the medium of the leaves, was created by means of dehairing, stretching and drying animal hides to make parchment. Only relatively late, hand-made paper produced from cellulose fibres of rags replaced parchment in Iceland.
2. *The sheets* were prepared for writing by means of cutting and folding them into the desired format. On each page a grid of writing lines was established using varying techniques. The design and layout could depend on both the content and future owner's wishes or financial capabilities.
3. *The writing* was usually done with quill pens made from feathers. Employing black or brown ink, scribes commonly worked on the main text first and left spaces for colourful elements to be filled in separately.
4. *The decoration* was added to guide and please the eye, using various colours and a range of materials. Colourful elements on the page include initials, rubrics (section headings), miniatures and other decoration.
5. *The bookbinding* was supplied last to protect the manuscript's leaves and keep them in a fixed order. Folded leaves, usually arranged in one or more gatherings, were sewn together and attached to boards or other forms of covers.[4]

The total number of surviving Icelandic manuscripts or parts thereof is generally estimated to be around 20,000. However, counting them is not straightforward. The vast majority of manuscripts date from after the Icelandic Reformation, as fewer than a thousand are from before the year 1600.[5] The same trend can be observed for charters.[6] Many more books

4 In Icelandic manuscripts it is not uncommon to see that the last two stages were not carried out consistently, left unfinished or added significantly later. For a detailed description of medieval Western manuscript production see e.g. Raymond Clemens and Timothy Graham, *Introduction to Manuscript Studies* (Ithaca and London: Cornell University Press, 2007), 3–64.

5 Guðvarður Már Gunnlaugsson, "Brot íslenskra miðaldahandrita," *Handritasyrpa: Rit til heiðurs Sigurgeiri Steingrímssyni sjötugum 2. október 2013*, ed. Rósa Þorsteinsdóttir (Reykjavík: Stofnun Árna Magnússonar, 2014), 127–128; see also Már Jónsson, "Manuscript Design," 232.

6 While ca. 1,500 Icelandic charters from before 1540 exist, the total number of charters and

and documents with handwritten texts were nonetheless produced over the course of centuries. For instance, over 80% of medieval manuscripts with legendary and chivalric vernacular content once written in Iceland are presumably now lost. Yet, this survival rate, estimated to be 16.9% based on unseen-species models, is comparably high.[7] Overall, preservation rates vary drastically between different kinds of texts, manuscript traditions and languages: at the other end of the spectrum for Iceland, only a single medieval codex written in Latin exists that was never dismantled (AM 679 4to). In addition, fragments of roughly 340 others remain, though thousands of Latin books must have once existed in Iceland.[8]

The present contribution provides a state of knowledge regarding the properties and production details of surviving pre-modern Icelandic manuscripts. The focus lies on material aspects of the objects and their making rather than the people involved. Hence, research on the raw materials used is included, as are, for example, technical details about the scribal process such as the speed of writing.[9] On the other hand, studies aiming to identify individuals or to recognize hands, styles and shared trades across manuscripts are not covered. Neither are the people nor networks and communities of manuscript production discussed here.[10]

The main period of interest is from the beginning of the transmission of handmade books from Iceland, i.e. around the middle of the twelfth

charter copies that once were in the possession of Árni Magnússon alone is close to 12,000, although this also includes Danish and Norwegian ones, see e.g. Silvia Hufnagel, "Der Wechsel von Pergament und Wachstafeln zu Papier in Island im 15. und 16. Jahrhundert," *Gutenberg-Jahrbuch* 95 (2020): 177.

7 Mike Kestemont et al., "Forgotten Books: The Application of Unseen Species Models to the Survival of Culture," *Science* 375 (2022): 768–769. Compared to other vernacular traditions in (Northern) Europe that were investigated, this preservation is only surpassed by the survival rate of Irish manuscripts of the same kind (p. 769).

8 Guðvarður Már Gunnlaugsson, "Latin Fragments Related to Iceland," *Nordic Latin Manuscript Fragments*, eds. Åslaug Ommundsen and Tuomas Heikkilä (London: Routledge, 2016), 169–175.

9 Though arguably closely related, paleographical studies and details regarding the development of Icelandic script are not included in the present article, as there is a longer-standing research tradition for them and overviews exist; see for instance Guðvarður Már Gunnlaugsson, "The Origin and Development of Icelandic Script," *Régionalisme et internationalisme : Problèmes de paléographie et de codicologie du Moyen Âge. Actes du XVe colloque du Comité international de paléographie latine (Vienne, 13–17 septembre 2005)*, eds. Otto Kresten and Franz Lackner (Vienna: Verlag der ÖAW, 2008), 87–94. Similarly, art-historical studies are not discussed in detail except where relevant.

10 This includes art-historical, paleographical and sociolinguistic research.

century, until parchment ceased to dominate the making of Icelandic manuscripts at the end of the sixteenth century. Thus, research on the introduction of paper in Iceland, which occurred while parchment was still the main writing support, is included but not its later developments. Details on bindings from after 1600 are also covered, as most current bindings on Icelandic parchment manuscripts postdate the leaves they protect, and later binding practices are therefore relevant for understanding their material history. In the following, the discussion of research on the specifics of Icelandic manuscripts is divided into four broad categories, roughly following the production stages of handmade books.

Writing Support

In Iceland, parchment for writing purposes was exclusively made from calfskin.[11] At least, all specimens studied to date for animal-species identification were sourced from calves.[12] Also, the preparation of the skins seems to have differed between Iceland and most of Europe. While it was common elsewhere to soak the animal hides in a lime bath during the dehairing process, Icelandic parchment does not appear to have been treated in that way. The levels of calcium in the parchment are too low for the hides to have been treated with lime or chalk.[13] Similarly, the amount of ancient DNA that has survived in the parchment of Icelandic manuscripts points in the same direction, as levels are higher than in comparable writing support from other traditions.[14] An alternative dehairing method that

11 Therefore, the more general term *parchment* is used everywhere, but in the context of Icelandic manuscripts it is supposed to be understood as referring to *vellum*, i.e. parchment made from calfskin.

12 See e.g. Jónas Kristjánsson, "Vellum and Literature," *Skarðsbók: Codex Scardensis AM 350 fol.*, eds. Jónas Kristjánsson, Ólafur Halldórsson and Sigurður Líndal, Manuscripta Islandica Medii Ævi 1 (Reykjavík: Lögberg, 1981), 40; Rannver H. Hannesson, "Analyser af islandske pergamenter," Kanditatspeciale, Konservatorskolen, Det kongelige danske Kunstakademi, Copenhagen, 1995, 25, 53; Björk Þorleifsdóttir, "Af bókfelli: Smásjárathuganir á íslenskum skinnhandritum," BA Thesis, University of Iceland, Reykjavík, 2003, 42, 57; Natasha Fazlic and Alex Speed Kjeldsen, "Om Morkinskinna's pergament," *Opuscula* 14 (2016): 389–391.

13 Rannver H. Hannesson, "Analyser," 46. He investigated the chemical composition of sixteen charters from the early fifteenth century to around 1600.

14 Jiří Vnouček, "The Parchment of Flateyjarbók," Oral presentation delivered at the seminar "Flateyjarbók: forn og ný," held in Reykjavík on 10 February 2023; recording available online: youtube.com/watch?v=pQVb3PR64ME (accessed 29 September 2025).

might have been used in Iceland is controlled rotting of the hides, for instance in rivers.[15] Experiments using this approach have resulted in partial removal of hair with their roots, while remaining hair had to be shaved off afterwards, in line with findings on existing manuscripts.[16] It has also been suggested that either geothermal water or other products containing sulphur may have been used in the dehairing process.[17] Sulphur has indeed been detected in selected Icelandic parchment; however, the use of geothermal clay can be excluded, and the presence of sulphur is more plausibly attributed to post-production air pollution.[18]

Icelandic parchment is often darker and rather coarse or thick compared to its European counterparts.[19] The extent to which the differences in appearance can be attributed to the manufacturing process versus factors such as repeated use and the conditions under which the manuscripts were stored, however, is not yet fully understood.[20] An example that illustrates the potential impact of post-production factors on the present colour is the fourteenth-century *Stjórn*-manuscript (AM 227 fol.). The manuscript includes some leaves with a distinctly darker hue than the rest.[21] Those leaves had been removed from the manuscript and had been used in bookbindings for decades before being reunited with the manuscript in the early

15 Jiří Vnouček, Matthew Teasdale and Sarah Fiddyment, "Parchment of Icelandic Manuscripts," Oral presentation delivered at the 19th International Seminar on the Care and Conservation of Manuscripts, held in Copenhagen 19–21 April 2023; abstract at https://nors.ku.dk/cc/programme-cc-19/ (accessed 14 February 2025). Other dehairing methods, mostly by means of decomposing, where the hides were at times folded flesh-side to flesh-side or simply stacked, are attested for Iceland from later centuries, see Þórarinn Hjartarson, *Skinna. Saga sútunar á Íslandi* (Reykjavík: Hið íslenzka bókmenntafélag, 2000), 19, 25–29.

16 Vnouček, "Parchment of Flateyjarbók."

17 E.g. Björk Þorleifsdóttir, "Af bókfelli," 21–23; Þórarinn Hjartarson, *Skinna*, 26–27.

18 Rannver H. Hannesson, "Analyser," 40, 49–50.

19 See e.g. Åslaug Ommundsen and Gisela Attinger, "Icelandic Liturgical Books and How to Recognize Them," *Scriptorium* 67 (2013): 306; Merete Geert Andersen, *Katalog over AM Accessoria 7. De latinske fragmenter*, Bibliotheca Arnamagnæana XLVI (Copenhagen: C. A. Reitzels Forlag, 2008), xvi, fn.14; Már Jónsson, "Manuscript Design," 236–237.

20 Vnouček et al., "Parchment of Icelandic Manuscripts"; Soffía Guðný Guðmundsdóttir and Laufey Guðnadóttir, "Book production in the Middle Ages," *The Manuscripts of Iceland*, eds. Gísli Sigurðsson and Vésteinn Ólason (Reykjavík: Árni Magnússon Institute in Iceland, 2015), 46–47.

21 I am grateful to Guðvarður Már Gunnlaugsson for first pointing this out to me.

eighteenth century.[22] Since it is unlikely that the production method of the leaves in question differed from the rest of the book, diverging storage conditions and use must have affected their current appearance. On the other hand, details of the parchment's production may have contributed to this discoloration taking place. Among others, the diverging dehairing methods may have resulted in more fatty acids remaining in the parchment, and oxidation of these acids can result in darkening of the leaves.[23] Consequently, with increasing knowledge of dehairing methods used in Iceland, it should become easier to establish their impact on the parchment's colour.

The thickness of Icelandic parchment leaves has been investigated in some cases. Measurements average around 0.3 mm with considerable variation in both directions.[24] Compared with this, the leaves of the *Codex Regius* of the Poetic Edda (GKS 2365 4to) with an average thickness of 0.235 mm have been described as "very thin"[25], which may not be unjustified in the Icelandic context, given that the thickness of a bifolium in *Flateyjarbók*, a manuscript often associated with grandeur, averages 0.272 mm.[26] On the other hand, in the context of European Bibles from the eleventh and twelfth centuries, leaves measuring 0.24–0.25 mm are perceived as "distinctly thick".[27] Similarly, calf parchment of European pocket Bibles from the thirteenth century which are famous for being made from ultrafine parchment, ranges between 0.09 and 0.28 mm in thickness, with a mean clearly below 0.2 mm.[28] In other words, even thin Icelandic parch-

22 See e.g. Jakob Benediktsson, "Some Observations on Stjórn and the Manuscript AM 227 fol.," *Gripla* 15 (2004): 10–12.

23 Rannver H. Hannesson, "Analyser," 45; see also Vnouček et al., "Parchment of Icelandic Manuscripts."

24 Calculations based on data from Rannver H. Hannesson, "Analyser," 60 and Björk Þorleifsdóttir, "Af bókfelli," 50–57.

25 Drífa Kristín Þrastardóttir, "The Making of the Codex Regius," *The Codex Regius of the Poetic Edda: Konungsbók Eddukvæða GKS 2365 4to*, eds. Guðvarður Már Gunnlaugsson, Haraldur Bernharðsson and Vésteinn Ólason (Copenhagen and Reykjavík: The Arnamagnæan Institute and The Árni Magnússon Institute for Icelandic Studies, 2019), 272–273.

26 Vnouček, "Parchment of Flateyjarbók."

27 Marilena Maniaci, "The Structure of Atlantic Bibles," *Trends in Statistical Codicology*, ed. Marilena Maniaci, Studies in Manuscripts Culture 19 (Berlin and Boston: De Gruyter, 2022), 41–42.

28 Sarah Fiddyment et al., "Animal Origin of 13th-Century Uterine Vellum Revealed Using Non-Invasive Peptide Fingerprinting," *PNAS* 112/49 (2015), 15069. A modern A4-sheet

ment appears thick compared to the finest European examples. This relative thickness of Icelandic parchment is consistent with visual observations noting traces of rough surface treatment, possibly indicating different, or less refined, working methods.[29] Yet, a more comprehensive study of the thickness of parchment from Iceland, potentially including surface treatments, is still lacking.

In Iceland, parchment was dominant as writing support longer than in other European and Nordic countries. The first evidence that paper was used for writing in Iceland dates to 1423, when a now-lost draft for a charter was written on paper.[30] However, the earliest surviving use of the new medium was not for writing purposes: In the year 1420, a parchment letter written by Bishop Jón Tófason (d. 1423) was sealed with small pieces of paper on a drop of wax, creating paper seals.[31] Finally, the oldest extant written artefact on paper is a charter, AM Dipl. Isl. Fasc. X,6, which attests to an exchange of land in 1437.[32] The first preserved paper manuscripts date from the middle of the sixteenth century, the oldest of them presumably being AM 232 8vo, a book of correspondence from the 1540s.[33] Yet, it was not until the last two decades of the sixteenth century that paper became widespread on the island and its use overtook that of parchment.[34]

Not all writing support employed in Icelandic manuscripts or documents, however, was new or previously unused at the time of writing. For

of paper is 0.1 mm thick.

29 E.g. Rannver H. Hannesson, "Analyser," 45; Vnouček et al., "Parchment of Icelandic Manuscripts."

30 Silvia Hufnagel, "Der Wechsel," 178.

31 Silvia Hufnagel, "The Rise of Paper: An Overview of Paper Provenance and Use in 15th- and 16th-Century Iceland," *Paper Stories – Paper and Book History in Early Modern Europe*, eds. Silvia Hufnagel, Þórunn Sigurðardóttir and Davíð Ólafsson, Materiale Textkulturen 38 (Berlin and Boston: De Gruyter, 2023), 17–18.

32 The partial watermark that is preserved in the piece of paper, a dragon's tail, makes it possible to trace its origin to the area of the Lower Rhine and the Rhine Delta, where it was presumably produced at least a decade before it was written on in Iceland (Hufnagel, "The Rise," 19–20).

33 Hufnagel, "Der Wechsel," 178–179.

34 Arna Björk Stefánsdóttir, "Um upptöku pappírs á Íslandi á sextándu og sautjándu öld," *Sagnir* 30 (2013), 228–232; see also Hufnagel, "The Rise," 17. Parchment manuscripts were still produced in Iceland in the seventeenth and eighteenth century, though presumably very few in number; see e.g. Katelin M. Parsons, "Relics of the Past: Calfskin, Authenticity and Nordic Antiquarianism," *Manuscript Studies* 9/2 (2024): 274–275.

parchment, such reuse usually entailed full or partial removal of textual or other content from the surface of the leaves, thus creating palimpsests. Yet, previously not written-on parts of leaves, such as margins, could also be repurposed for writing.[35] Two types of palimpsestation may be distinguished, *parchment recycling*, on the one hand, and *manuscript recontextualization*, on the other.[36] The former was evidently practised in Iceland from the very beginning of book production onward, whereas examples of the latter only survive post-Reformation.[37]

In sum, preserved Icelandic parchment sets itself apart from other contemporary writing supports by often being relatively dark and thick. In addition, parchment was in use in Iceland until relatively late. Both the colour and thickness have been addressed in several smaller studies on Icelandic parchment, but the dehairing process has received most attention, as its methods clearly differed from European standards. Nevertheless, the exact impact of the production details on the parchment's present-day appearance is less well understood. Among others, the various hypotheses regarding alternative dehairing methods are still to be confirmed or rejected based on larger data sets. For now, core details of parchment production in Iceland and the precise reasons for its distinct appearance remain open to interpretation.

Gatherings and Design

Sheets were folded and nested inside each other to form gatherings. The dimensions of parchment sheets could vary considerably depending on natural factors such as the size, sex and age of the animal, as well as how a hide was cut. In particular, the number of full sheets that a single hide yielded could be higher than one, meaning that there is no strict correspondence between the number of parchment sheets and animal hides.[38]

35 A sixteenth-century manuscript produced in that way and written by the priest Gottskálk Jónsson í Glaumbæ (1524–1590) is preserved as Isl. Perg. 8vo no. 5; see e.g. Tom Lorenz, "Latin *in situ* Fragments Connected to Iceland: A Survey," *Scripta Islandica* 75 (2024): 83–85.

36 Tom Lorenz, "Recycling and Recontextualisation in Medieval and Early Modern Icelandic Palimpsests," *Gripla* 35 (2024): 33.

37 Lorenz, "Recycling," 34.

38 The size of hand-made paper, on the other hand, was fairly stable, which led to the establishment of format classifications for manuscripts based on how often the (paper) sheets had been folded.

For Iceland, it was first suggested that the leaves of *Codex Regius* had been cut in a different manner from one that would result in a single full sheet per hide (two bifolia, in this case),[39] and more recently, detailed observations on *Flateyjarbók* confirmed that during its production, some hides were cut into two full sheets.[40] However, as other manuscripts have yet to be studied, general assessments of the relationship between hides and sheets are currently not possible.

The number of bifolia that typically formed a gathering in Icelandic manuscripts varies, but at least in the fourteenth century, the quaternion, a gathering made of four bifolia, was predominant.[41] The structure within individual gatherings can also differ with regard to how the leaves' hair- and flesh-sides are arranged. From other European traditions, two main patterns are best known: on the one hand, the so-called Gregory's rule, referencing a distribution in which hair-sides of leaves face hair-sides and flesh-sides face flesh-sides, and, on the other, a fashion associated with the British Isles, in which hair-sides consistently face flesh-sides of leaves (usually referred to as the *insular method*). A recent study of large-size fourteenth-century manuscripts indicates that most Icelandic codices from that period do not adhere to either of these two patterns.[42] Instead, the orientation of hair- and flesh-sides tends to be inconsistent, which parallels findings from the Irish tradition. At the same time, the dimensions of the leaves might play a role in how gatherings are constructed, though mostly from loose bifolia.[43] In general, little scholarly knowledge exists on the size and construction of gatherings in medieval Iceland for centuries other than the fourteenth, leaving possible changes over time underexplored.

In terms of book design, a high number of very small manuscripts appear to have been preserved from Iceland. Comparison of the *semiperimetro*, the height plus width of leaves, in medieval Icelandic manuscripts to

39 Drífa Kristín Þrastardóttir, "The Making," 287.

40 Vnouček, "Parchment of Flateyjarbók."

41 Björk Þorleifsdóttir, "Af bókfelli," 40–41; Lea D. Pokorny, "Consistently Inconsistent: Constructing Gatherings in Fourteenth-Century Iceland," *Manuscript Studies* (forthcoming).

42 Pokorny, "Consistently Inconsistent"; supported by examples in Natasha Fazlic and Alex Speed Kjeldsen, "Om Morkinskinnas pergament," 391–393 and Drífa Kristín Þrastardóttir, "The Making," 286. Previously, a considerably smaller study had concluded that almost 80% of leaves followed Gregory's rule; see Björk Þorleifsdóttir, "Af bókfelli," 40–41. The differing results highlight, among others, the importance of study sizes and how a corpus is chosen.

43 Pokorny, "Consistently Inconsistent."

codices from elsewhere in Europe found that very few fall into the largest category used by scholars abroad, while the smallest sizes occur more frequently.[44] However, this picture is probably skewed, among others by a much higher survival rate of manuscripts written in the vernacular Icelandic relative to those written in Latin.[45] Moreover, compared to most other Western manuscripts, Icelandic handwritten books tend to have slightly different proportions, with the leaves being wider relative to their height. The average ratio of the leaves' width relative to their height in Icelandic manuscripts lies clearly above 0.73,[46] while for other European manuscripts, the ratio is closer to 0.71.[47] Yet, dimensions of manuscripts as they are today might not reflect the books' original proportions due to (repeated) trimming of leaves in conjunction with rebinding over the course of the centuries. Such trimming usually affected the height more than the width, because only one of the sides was cut, while both the top and the bottom of the leaves were trimmed.

With regard to the page layout, a notable change occurred in Europe in the thirteenth century: the placement of the first written line of text on a page was moved from above the top line of the ruling grid to below it. For Iceland, a study of selected manuscripts indicates that a similar trend may have taken place with a delay of roughly one century – some manuscripts from the fourteenth century appear to display this practice – before being reversed again in later centuries.[48] Additionally, ruling and pricking methods in medieval Iceland were quite varied, although roughly comparable to Western European habits of the time. Both knives and awls, pointed instruments for punching round holes, were used for pricking, and ruling was done with either ink or lead, or using an instrument that today

44 Guðvarður Már Gunnlaugsson, "Brot," 130–133; Már Jónsson, "Megindlegar handritarannsóknir," 28–29.

45 See e.g. Guðvarður Már Gunnlaugsson, "Brot," 133.

46 Guðvarður Már Gunnlaugsson and Már Jónsson calculated the ratio to be 0.739 and 0.734, respectively; see Guðvarður Már Gunnlaugsson, "Brot," 135–137; Már Jónsson, "Megindlegar handritarannsóknir," 29–30, "Manuscript Design," 241.

47 See e.g. J. Peter Gumbert, "Sizes and Formats," *Ancient and Medieval Book Materials and Techniques*, eds. Marilena Maniaci and Paola F. Munafò, Vol. 1. Studi e testi 357 (Città del Vaticano: Biblioteca Apostolica Vaticana, 1993), 233–234. The ratio of a modern A4 papersheet is 0.707.

48 Már Jónsson, "Fyrstu línur á blaðsíðum skinnhandrita: Fyrir ofan eða fyrir neðan efsta strik?," *Gripla* 13 (2002): 218–220, 225–226.

evidences as lighter lines on the parchment.[49] Traces of ink having been used for ruling are rare in the earlier manuscripts from Iceland but gradually increase with time.[50] Assuming that the scribes pricked and ruled for themselves, some may have had a fixed personal preference, while others varied their tools.[51]

So far, most research regarding gatherings and page design of Icelandic manuscripts has focused on codices from the fourteenth century. That attention bias still leaves a considerable gap to be filled with regard to other centuries as well as possible developments, even though the available research provides valuable indications. From what is known, notable differences between Iceland and most European traditions include the dimensions and proportions of manuscripts and the distribution of hair- and flesh-sides within gatherings.

Writing and Embellishment

The extent to which raw materials for inks and colourful paints were sourced locally and prepared according to domestic recipes in Iceland has been much debated. Sources preserving detailed instructions for how to make inks do not survive from the Middle Ages.[52] But extant recipes from the seventeenth century onwards demonstrate how writing ink could be made from local ingredients alongside imported materials.[53] By this time,

49 Ibid., 226–227, and Lea D. Pokorny, "Pricking, Ruling, Helgafell? Book Production, Its Features, and Its Circumstances," *Book Production at Helgafell? New Perspectives on a Suspected Scriptorium in 14th-Century Iceland*, eds. Beeke Stegmann and Þórdís Edda Jóhannesdóttir (Reykjavík: Stofnun Árna Magnússonar í íslenskum fræðum, forthcoming). In the former, lighter lines are considered the result of dry ruling; see Már Jónsson, "Fyrstu línur," 221–222.

50 Már Jónsson, "Fyrstu línur," 226–227.

51 Pokorny, "Pricking," (forthcoming).

52 The manuscript AM 194 8vo preserves instructions for how to guild and paint sculptures, written in 1387. It touches upon which binder materials to use for which colour, but the pigments themselves are not identified explicitly; edited in Kristian Kålund, *Alfræði Íslenzk: Islandsk encyklopædisk litteratur*. Vol. I: *Cod. Mbr. AM. 194, 8vo*, Samfund til Udgivelse af Gammel Nordisk Litteratur XXXVII (København: S. L. Møllers Bogtrykkeri, 1908), 89–91. For an English translation and commentary, see Unn Plahter, "Líkneskjusmíð: Fourteenth century instructions for painting from Iceland," *Zeitschrift für Kunsttechnologie und Konservierung* 6 (1992): 167–173.

53 The best-known account of making writing ink from local ingredients dates from the seventeenth century but the method is often said to be older; see e.g. Soffía Guðný

the writing culture in Iceland had at least in part developed from a professional craft into more of a private endeavour for personal needs: this fact may have fostered preferences for local and more affordable ingredients. However, it is still uncertain how far back in time the domestic way of preparing writing ink goes.

It is clear that during the Middle Ages, multiple pigments used in European manuscript decoration were also imported to Iceland. A manuscript from the second half of the fifteenth century preserves a list of various foreign painting materials, detailing their selling prices in Bergen, Norway.[54] That such pigments were used in Icelandic manuscript production was first confirmed by non-destructive, non-invasive methods applied to a gathering of the fourteenth-century manuscript *Skarðsbók Jónsbókar* (AM 350 fol.), published in 1995.[55] Since then, a number of Icelandic manuscripts, ranging from the twelfth through the fourteenth century, have been analysed with scientific methods. Findings regularly include pigments such as vermilion (cinnabar), azurite, verdigris and orpiment, none of which are local to Iceland, but also provide evidence of more expensive or rare pigments including ultramarine, indigo, vivianite and iron phosphates.[56] Gold has so far only been identified with analytical tools in one instance in a manuscript produced in Iceland: in an historiated initial on f.

Guðmundsdóttir and Laufey Guðnadóttir, "Book Production," 51–52. Recipes using imported goods are recorded for instance in the manuscripts JS 117 8vo, JS 395 8vo, Lbs 240 4to, Lbs 946 8vo and Lbs 1199 III 4to (all dated to the eighteenth and nineteenth centuries with the last one possibly being slightly older; see relevant entries on handrit.is, (accessed 14 February 2025).

54 AM 685 d 4to, f. 29r; edited in Kristian Kålund, *Alfræði Íslenzk: Islandsk encyklopædisk litteratur*. Vol. 3: Landlýsingar m.fl., Samfund til Udgivelse af Gammel Nordisk Litteratur XLV (København: S. L. Møllers Bogtrykkeri, 1917–18), 74. For a detailed discussion see Unn Plahter, *Painted Altar Frontals of Norway 1250–1350*. Vol. 2: *Materials and Technique*, with contributions from Bjørn Kaland, Katharina von Salis, Sophie Stos and Raymond White (London: Archetype Publications, 2004), 57–60.

55 Stephen P. Best et al., "Identification by Raman Microscopy and Visible Reflectance Spectroscopy of pigments on an Icelandic manuscript," *Studies in Conservation* 40/1 (1995): 31–40.

56 Esben Bukh Glindvad, "A Comparative Technical Analysis of Pigments Used in Twelve Medieval Manuscripts from the Arnamagnæan Manuscript Collection, Copenhagen," *Care and Conservation of Manuscripts* 19 (2025), 187–200; Giulia Zorzan et al., "Not Quite *ultima Thule*: A Voyage into the Colorants of Medieval Icelandic Manuscripts," Oral presentation given at the 20th International Seminar on the Care and Conservation of Manuscripts, held in Copenhagen 9–11 April 2025; abstract at https://nors.ku.dk/cc/cc20-programme/ (accessed 11 February 2025). Other pigments identified include red ochre, yellow ochre, green earth, red lead, lead white, bone white and carbon (see also following footnote).

96r of the *Stjórn* manuscript AM 227 fol., dated to the fourteenth century.[57] However, since that particular initial was changed after the original production of the manuscript, it is uncertain when the gold was applied.[58]

For other pigments identified in medieval Icelandic manuscripts, a domestic source cannot be excluded. Bone white and coloured earths, for instance, could plausibly have come from local origins.[59] Further, the use of green earth in minor initials (in addition to historiated initials) has been identified in a group of Icelandic fourteenth-century manuscripts. Finding this pigment on the lower levels of the initial hierarchy is rare elsewhere in Europe and might hint at a local practice.[60] Overall, however, test results suggest that only approximately half of the colorants identified in medieval Icelandic manuscripts could have been sourced locally – that is if knowledge of the specific production techniques was available.[61] Knowing for certain that a range of pigments used in Icelandic manuscripts in the medieval period were acquired from abroad, it is conceivable that standard ingredients for writing ink used in Europe – such as gall apples for iron-gall ink – were also brought into the country. Scientific analysis of writing ink in Icelandic medieval manuscripts has identified the presence of iron,[62] but it remains to be investigated whether this may be due to the ink being prepared in the domestic way using iron sulphates from peat soils.[63]

Calculations of how fast medieval Icelandic scribes wrote have been

57 Unpublished analysis by Maurizio Aceto and Angelo Agostino (Autumn 2021). Other medieval Icelandic manuscripts for which the presence of gold has been suggested, but not tested, include Isl. Perg. 4to no. 16, see e.g. Lena Liepe, *Studies in Icelandic Fourteenth Century Book Painting* (Reykholt: Snorrastofa, Cultural and Medieval Centre, 2009), 191.

58 Guðbjörg Kristjánsdóttir, "Handritalýsingar í benediktínaklaustrinu á Þingeyrum," *Íslensk klausturmenning á miðöldum*, ed. Haraldur Bernharðsson (Reykjavík: Miðaldastofa Háskóla Íslands, 2016), 253–255.

59 On the occurrence of bone white, see Best et al., "Identification," 38. Red, green and yellow earths from Iceland are still being used, for instance, by the pigment supplier Kremer Pigmente GmbH & Co. KG, see http://kremer-pigmente.com/en/shop/pigments/11553-set-iceland-earthcolours-assortment.html (accessed 3 October 2024).

60 Giulia Zorzan, "The Colourful Codex," *Book Production at Helgafell? New Perspectives on a Suspected Scriptorium in 14th-Century Iceland*, eds. Beeke Stegmann and Þórdís Edda Jóhannesdóttir (Reykjavík: Stofnun Árna Magnússonar í íslenskum fræðum, forthcoming).

61 There is, for example, evidence of orchil, a pigment derived from lichens, having been used in Iceland, which would have required knowledge of its elaborate production technique if manufactured in Iceland; see Zorzan et al., "Not Quite *ultima Thule*."

62 Zorzan et al., "Not Quite *ultima Thule*"; Esben Bukh Glindvad, "A Comparative Technical Analysis," 196–198.

63 For recipes, see fn. 53 above.

conducted for a single manuscript, *Flateyjarbók*. More specifically, it is estimated that it took a total of 8.5 months to write the roughly 184 large leaves comprising the main part of *Flateyjarbók*, with an average speed of 200 lines per day (not including pricking and ruling of the leaves).[64] Since the oldest part of *Flateyjarbók* is known to have been written between 1387 and 1394, this is one more example of an aspect of manuscript production in Iceland that has so far only been studied for the fourteenth century. Another feature for which this is true is how texts in medieval Icelandic manuscripts were corrected: for fourteenth-century manuscripts from Iceland, textual correction has been identified as a separate production step, consistent with practices abroad.[65] On the other hand, the number of different technical signs employed in Icelandic texts appears to have been rather limited. Icelandic scribes also displayed a greater freedom in their use of these correction signs compared to their Western European colleagues, who relied more on established sets of signs with fixed meanings.[66]

Scholarly knowledge regarding the division of labour and union of functions in providing texts, rubrics and/or decoration in Icelandic parchment manuscripts is also still improving. Examples have long been known of scribes who also acted as illuminators,[67] and not infrequently, a hand that wrote the main text can also be found in the rubrics of the same manuscript.[68] The latter, however, is not always the case: preliminary

64 Guðvarður Már Gunnlaugsson, "How Fast Did the Scribes of Flateyjarbók Write?," *RE:writing: Medial Perspectives on Textual Culture in the Icelandic Middle Ages*, eds. Kate Heslop and Jürg Glauser, Medienwandel – Medienwechsel – Medienwissen 29 (Zürich: Chronos, 2018), 217.

65 Lea D. Pokorny, "Correcting Icelandic Manuscripts in the Second Half of the Fourteenth Century: Techniques and Context," *Scripta Islandica* 75 (2024): 135, 157–158.

66 Ibid., 148–149.

67 Most notably, in *Flateyjarbók* Magnús Þórhallsson identified himself as both scribe and illuminator (GKS 1005 fol., f. 1v). For other examples see e.g. Guðbjörg Kristjánsdóttir, "Lýsingar í íslenskum handritum á 15. öld," *Gripla* 27 (2016): 157–233; as well as Lea D. Pokorny, "Skrifari og listamaður: Falið andlit í AM 226 fol.," *Árnastofnun*, 22 April 2022, Árnastofnun.is/is/utgafa-og-gagnasofn/pistlar/skrifari-og-listamadur-falid-andlit-i-am-226-fol. (accessed 4 October 2024).

68 For example, in *Morkinskinna* (GKS 1009 fol.), the rubrics, and possibly initials, were supplied by one of the two scribes of the text. This scribe (hand A) may have further supervised the writing of *Morkinskinna* and corrected the writing of hand B; see Alex Speed Kjeldsen, *Filologiske studier i Kongesagahåndskriftet Morkinskinna*, Bibliotheca Arnamagnæana Suppl. 7 (Copenhagen: Museum Tusculanum Press, 2013), 45–46.

investigations into fourteenth-century manuscripts associated with the religious house at Helgafell, for instance, indicate that significantly more hands appear to have contributed to the writing of the manuscripts when the rubrics are considered.[69] Such investigations are, however, complicated by the possibility that scribes wrote in several hands. Moreover, for certain manuscripts of the same corpus it has been argued that the pen-flourishing of initials was not done by the scribes themselves (as has been suggested for some foreign manuscripts), but rather by the illuminator in question. Additionally, the same person may or may not have supplied rubrics.[70] Finally, *Reykjabók* of *Njáls saga* (AM 468 4to) has been identified as a manuscript in which the rubricator was also responsible for marginal additions and possibly provided initials.[71] Accordingly, many observations made so far on the division of labour in Icelandic manuscripts are based on individual cases and cannot be generalized. To achieve that, larger and more comparative studies are necessary.

As a whole, what is known about the material and technical aspects of writing and embellishment in Icelandic parchment manuscripts is biased toward the fourteenth century. For that period, though, many different aspects have been addressed, even if only in a single study. Especially regarding the colourants used in Icelandic manuscripts, the application of modern analytical techniques has significantly contributed to a more nuanced understanding of the materials and their possible origins. In part, these results correct romanticized notions of medieval Icelandic manuscripts being made solely from local resources.

69 Beeke Stegmann, Lea D. Pokorny and Giovanni Verri, "Revisiting a Scribal Network Based on Rubrics," Oral presentation delivered at Leeds International Medieval Congress, held in Leeds, 3–6 July 2023.

70 See e.g. Liepe, *Studies*, 157–70 and "Image, Script and Ornamentation in the 'Helgafell Manuscripts'," *From Nature to Script: Reykholt, Environment, Centre, and Manuscript Making*, eds. Helgi Þorláksson and Þóra Björg Sigurðardóttir (Reykholt: Snorrastofa, Cultural and Medieval Centre, 2012), 245–271.

71 Beeke Stegmann, "Collaborative Manuscript Production and the Case of Reykjabók: Paleographical and Multispectral Analysis," *New Studies in the Manuscript Tradition of Njáls saga: The* historia mutila *of Njála*, eds. Emily Lethbridge and Svanhildur Óskarsdóttir (Kalamazoo: Medieval Institute Publications, 2019), 44.

Bindings and Seals

Bookbindings that survive on Icelandic parchment manuscripts show a large variety of styles, often dating later than the leaves. Limp bindings represent the oldest type of bookbinding generally known, and are characterized by their flexible covers, to which gatherings are directly attached.[72] Wrap-around limp bindings made from sealskin that are found on some Icelandic manuscripts are therefore often assumed to be contemporary with the enclosed leaves, even if a degree of uncertainty remains.[73] On the other hand, bindings with bare wooden boards and an open spine on medieval Icelandic manuscripts generally postdate the leaves they protect. More specifically, dendrochronological research has found that the wood often comes from trees felled in the late sixteenth century in the general area of Northern Germany.[74] Similarly, a number of prestigious parchment manuscripts have younger reddish-brown leather bindings on wooden boards with blind tooling of a distinct style. The tools can be traced back to bookbinding activities first at the bishopric of Hólar and later at Skálholt in the late sixteenth and seventeenth centuries.[75]

The particular styles or materials used in the covers or around the boards can further help date them. For example, with regard to reused parchment, different styles are associated with specific collectors or owners. Not only is Árni Magnússon thought to have provided professional bookbinders with various discarded parchment,[76] but certain styles of limp

72 J. A. Szirmai, *The Archaeology of Medieval Bookbinding* (Ashgate: Routledge, 1999), 287–288.

73 See e.g. Emily Lethbridge, "Gráskinna: Material Aspects of a pocket, patchwork Njála," *New Studies in the Manuscript Tradition of Njáls saga: The* historia mulita *of Njála*, eds. Emily Lethbridge and Svanhildur Óskarsdóttir (Kalamazoo: Medieval Institute Publications, 2018), 59–66. Examples of sealskin limp bindings are found on *Gráskinna* (GKS 2870 4to) and the *Icelandic Homily Book* (Isl. Perg 4to no. 15).

74 Among the bindings analysed, the only exception formed the lower board of Isl. Perg 4to no. 6, which dates to after 1335 and originates from Southern Sweden. However, it is unknown when it became part of that manuscript's binding; see Niels Bonde and Peter Springborg, "Wooden Bindings and Tree-Rings: A Preliminary Report," *Care and Conservation of Manuscripts* 8 (2005): 15; "Wooden Bindings and Tree-Rings: A Conclusion," *Care and Conservation of Manuscripts* 9 (2006): 7–8.

75 Examples are AM 227 fol. (Stjórn) and AM 351 fol. (*Skálholtsbók eldri*); see Jakob Benediktsson, "Some Observations," 12 and Chr. Westergård-Nielsen, "Introduction," *Skálholtsbók eldri: Jónsbók etc. AM 351 fol.*, ed. Chr. Westergård-Nielsen, Early Icelandic Manuscripts in Facsimile 9 (Copenhagen: Rosenkilde and Bagger, 1971), 27–29.

76 See e.g. Peter Springborg, "The Care Taken by Árni Magnússon of the Manuscripts in his Collection: A Study of Records," *Care and Conservation of Manuscripts* 2 (1996): 11–20.

bindings made from reused manuscript leaves can also be useful in dating and localizing the binding activity in question.[77] For cardboard bindings, a particular type of thin, grey binding with printed waste on the inside has been traced back to a large-scale binding initiative at the Arnamagnæan Collection in Copenhagen in the 1770s.[78] Further, watermark research has proven helpful for dating paper in endleaves and therewith often the binding itself.[79] Still, many bindings on Icelandic manuscripts and their styles have not yet been described in detail, meaning that their age and other production details can only be guessed at.

Charters are usually distinguished from codices by not being bound, as they tend to consist only of single leaves. Further, they regularly feature seals as proof of authenticity. Relatively little research has been done on Icelandic seals so far, but both wax and paper seals exist.[80] Appended seals appear to have been exclusively hung from parchment straps.[81] The matrices used to create the imprints in seals were made from different materials as well, mostly copper or a copper alloy such as bronze. Some examples from Iceland exist that are made of silver, tin and even walrus tooth.[82] The shape and size of the wax lumps used in appended seals varied, among other factors according to the status of the people or institutions involved. In addition, the utensils for pressing against the matrices could differ.[83] Examples of what has not yet been researched include the pigments used

77 E.g. Tom Lorenz, "Latin *in situ* Fragments," 80–81.

78 Peter Springborg, "The Work of Conservation at the Arnamagnæan Institute," *Care and Conservation of Manuscripts* (1995): 45–46.

79 Beeke Stegmann, "Papierforschung im Dienste der Buchgeschichte: Einbände des 18. Jahrhunderts in der Handschriftensammlung Árni Magnússons," *Paper History*, 29/1 (2025): 7–16.

80 For paper seals, see above.

81 Personal communication with Guðrún Harðardóttir, 18 February 2025. Other materials used for sealing, such as silk thread for hanging the seal, also survive in Icelandic archives but only on charters produced outside of Iceland, e.g. the Royal charter from Christian II of Denmark, AM Dipl. Isl. Facs. XXXVIII,10. I am thankful to Bjarni Gunnar Ásgeirsson for pointing me to this example.

82 Guðmundur Magnússon, "Icelandic Medieval Seals: History and Research," *Middelalderlige seglstamper i Norden*, eds. Michael Andersen and Göran Tegnér (Roskilde: Roskilde Museum Forlag, 2002), 15–16; Guðrún Harðardóttir, "Myndefni íslenskra klausturinnsigla," *Íslensk klausturmenning á miðöldum*, ed. Haraldur Bernharðsson (Reykjavík: Miðaldastofa Háskóla Íslands, 2016), 202.

83 Personal communication with Guðrún Harðardóttir, 20 February 2025.

to colour the wax of Icelandic seals and a comparison of those to pigments found in Icelandic codices.

To date, numerous questions about the production details of seals, as well as many bindings, of Icelandic origin remain open – particularly from the early periods. They have in common that preservation is often relatively poor, as they were particularly susceptible to wear and tear. Bindings tended to be replaced over the centuries, meaning that few original bindings exist, and many seals have been lost or deteriorated over time, further complicating analysis. Nonetheless, future studies on material aspects of Icelandic bindings, as well as seals, will hopefully allow for both better insight into internal developments and comparison with other manuscript traditions.

Concluding Remarks

Thanks to the recent increase in material-codicological research, the scholarly understanding of the specifics of manuscript production in pre-modern Iceland has improved considerably. Bit by bit, various projects and initiatives are providing a more nuanced foundation for analysing both parallels with and differences from manuscript production in other parts of Europe. For example, different methods appear to have been used to dehair hides for Icelandic parchment, not using the lime bath typical elsewhere. Since limestone is not native to Iceland, this may reflect an adaptation of the production process to local circumstances. In contrast, imported pigments were regularly used, suggesting that not all aspects of Icelandic manuscript production were fully adapted to local resources.

Codicological investigations have especially focused on the fourteenth century. This trend aligns with the dating of many of Iceland's most famous codices and with what is often referred to as the 'Golden Age' of Icelandic manuscript production.[84] Other periods, however, have yet to receive comparable attention. Moreover, several studies are based on small corpora or are unique in their approach, meaning that their findings still require confirmation from larger investigations as well as other comparable studies. Addressing these gaps will enable more meaningful analyses of

84 E.g. Guðvarður Már Gunnlaugsson, "Manuscripts and Palaeography," *A Companion to Old Norse-Icelandic Literature and Culture*, ed. Rory McTurk, reprinted with corrections, Blackwell Companions to Literature and Culture 31 (Malden, MA: Blackwell, 2011), 250.

long-term trends and developments, ultimately contributing to a deeper understanding of these cultural heritage objects as material artefacts.

Where they have been applied, technological innovations and interdisciplinary methods have significantly advanced scholarship – especially in the identification of materials such as pigments, wood types and animal species. Further collaboration with neighbouring disciplines and the continued application of methods from other fields are expected to deepen our understanding of Icelandic manuscript production. Not least, rapid developments in Heritage Science and Digital Humanities offer promising new opportunities. At the same time, while many raw materials used in Icelandic parchment production have now been identified, the specific motivations or details behind some practices that diverge from broader Western traditions still need to be fully explained.

In general, research on the details of manuscript production often intersects with the study of other aspects of the book. For instance, analysis of bookbindings frequently overlaps with studies of transmission history and material reuse. Even though this article has attempted to treat material codicology separately, such investigations are closely interwoven with other manuscript-based disciplines, including palaeography, art history and historical linguistics. These fields both depend on and enrich one another. At the same time, a well-rounded and materially informed understanding of the craftsmanship involved in Icelandic manuscript production provides a broad foundation for fruitful interaction with adjacent academic fields such as medieval Icelandic literature, archaeology and socio-economic history.[85] One promising synergy lies in combining the study of how a manuscript was made with ecocritical approaches to the texts it preserves.[86] In short, deepening our knowledge of the material aspects of Icelandic manuscripts not only enhances scholarly understanding of production practices but also opens new pathways for interdisciplinary insights into Iceland's cultural heritage.

85 On reciprocal benefits of the growing codicological interest and other subfields of Old Norse Studies, such as genre studies, see e.g. Jóhanna Katrín Friðriksdóttir, "Manuscripts and Codicology," *A Critical Companion to Old Norse Literary Genre*, eds. Massimiliano Bampi, Carolyne Larrington and Sif Ríkharðsdóttir (Cambridge: Cambridge University Press, 2020), 89–111.

86 See also Lethbridge, "Manuscripts," 58.

BIBLIOGRAPHY

LIST OF MANUSCRIPTS

The Árni Magnússon Institute for Icelandic Studies, Reykjavík

AM 227 fol.
AM 350 fol.
AM 351 fol.
AM 679 4to
AM 232 8vo
AM Dipl. Isl. Fasc. X,6
AM Dipl. Isl. Facs. XXXVIII,10
GKS 1005 fol.
GKS 2365 4to
GKS 2870 4to

The Arnamagnæan Institute, Copenhagen

AM 468 4to
AM 685 d 4to
AM 194 8vo

Royal Danish Library, Copenhagen

GKS 1009 fol.

The National and University Library of Iceland, Reykjavík

Lbs 240 4to
Lbs 946 8vo
Lbs 1199 4to
JS 117 8vo
JS 395 8vo

National Library of Sweden, Stockholm

Isl. Perg 4to no. 6
Isl. Perg 4to no. 15
Isl. Perg 4to no. 16
Isl. Perg 8vo no. 5

PRIMARY SOURCES

Alfræði Íslenzk: Islandsk encyklopædisk litteratur. Vol. 1: *Cod. Mbr. AM. 194, 8vo*, ed. by Kristian Kålund. Samfund til Udgivelse af Gammel Nordisk Litteratur XXXVII. København: S. L. Møllers Bogtrykkeri, 1908.

Alfræði Íslenzk: Islandsk encyklopædisk litteratur. Vol. 3: *Landlýsingar m.fl.*, ed. by Kristian Kålund. Samfund til Udgivelse af Gammel Nordisk Litteratur XLV. København: S. L. Møllers Bogtrykkeri, 1917–18.

SECONDARY SOURCES

Andersen, Merete Geert. *Katalog over AM Accessoria 7. De latinske fragmenter*. Bibliotheca Arnamagnæana XLVI. Copenhagen: C. A. Reitzels Forlag, 2008.

Arna Björk Stefánsdóttir. "Um upptöku pappírs á Íslandi á sextándu og sautjándu öld." *Sagnir* 30 (2013): 226–236.

Best, Stephen P. et al. "Identification by Raman Microscopy and Visible Reflectance Spectroscopy of Pigments on an Icelandic Manuscript." *Studies in Conservation* 40/1 (1995): 31–40.

Björk Þorleifsdóttir. "Af bókfelli: Smásjárathuganir á íslenskum skinnhandritum." BA Thesis, University of Iceland. Reykjavík, 2003.

Bonde, Niels and Peter Springborg. "Wooden Bindings and Tree-Rings: A Preliminary Report." *Care and Conservation of Manuscripts* 8 (2005): 9–18.

Bonde, Niels and Peter Springborg. "Wooden Bindings and Tree-Rings: A Conclusion." *Care and Conservation of Manuscripts* 9 (2006): 7–22.

Clemens, Raymond and Timothy Graham. *Introduction to Manuscript Studies*. Ithaca and London: Cornell University Press, 2007.

Drífa Kristín Þrastardóttir. "The Making of the Codex Regius." *The Codex Regius of the Poetic Edda: Konungsbók Eddukvæða GKS 2365 4to*, ed. by Guðvarður Már Gunnlaugsson, Haraldur Bernharðsson and Vésteinn Ólason, 255–344. Copenhagen and Reykjavík: The Arnamagnæan Institute and The Árni Magnússon Institute for Icelandic Studies, 2019.

Fazlic, Natasha and Alex Speed Kjeldsen. "Om Morkinskinnas pergament." *Opuscula* 14 (2016): 389–393.

Fiddyment, Sarah et al. "Animal Origin of 13th-Century Uterine Vellum Revealed Using Non-Invasive Peptide Fingerprinting." *PNAS* 112/49 (2015): 15066–71.

Glindvad, Esben Bukh. "A Comparative Technical Analysis of Pigments Used in Twelve Medieval Manuscripts from the Arnamagnæan Manuscript Collection, Copenhagen." *Care and Conservation* 19 (2025), 187–200.

Guðbjörg Kristjánsdóttir. "Handritalýsingar í benediktínaklaustrinu á Þingeyrum." *Íslensk klausturmenning á miðöldum*, ed. by Haraldur Bernharðsson. Reykjavík: Miðaldastofa Háskóla Íslands, 2016, 227–311.

Guðbjörg Kristjánsdóttir. "Lýsingar í íslenskum handritum á 15. öld." *Gripla* 27 (2016): 157–233.

Guðmundur Magnússon. "Icelandic Medieval Seals: History and Research." *Middelalderlige seglstamper i Norden*, ed. by Michael Andersen and Göran Tegnér. Roskilde: Roskilde Museum Forlag, 2002, 9–18.

Guðrún Harðardóttir. "Myndefni íslenskra klausturinnsigla." *Íslensk klausturmenning á miðöldum*, ed. by Haraldur Bernharðsson. Reykjavík: Miðaldastofa Háskóla Íslands, 2016, 201–225.

Guðvarður Már Gunnlaugsson. "Brot íslenskra miðaldahandrita." *Handritasyrpa: Rit til heiðurs Sigurgeiri Steingrímssyni sjötugum 2. október 2013*, ed. by Rósa Þorsteinsdóttir. Reykjavík: Stofnun Árna Magnússonar, 2014, 121–140.

Guðvarður Már Gunnlaugsson. "How Fast Did the Scribes of Flateyjarbók Write?" *RE:writing: Medial Perspectives on Textual Culture in the Icelandic Middle Ages*, ed. by Kate Heslop and Jürg Glauser. Medienwandel – Medienwechsel – Medienwissen 29. Zürich: Chronos, 2018, 195–224.

Guðvarður Már Gunnlaugsson. "Latin Fragments Related to Iceland." *Nordic*

Latin Manuscript Fragments, ed. by Åslaug Ommundsen and Tuomas Heikkilä. London: Routledge, 2016, 163–183.

Guðvarður Már Gunnlaugsson. "Manuscripts and Palaeography." *A Companion to Old Norse-Icelandic Literature and Culture*, ed. by Rory McTurk. Reprinted with corrections. Blackwell Companions to Literature and Culture 31. Malden, MA: Blackwell, 2011, 245–264.

Guðvarður Már Gunnlaugsson. "The Origin and Development of Icelandic Script." *Régionalisme et internationalisme : Problèmes de paléographie et de codicologie du Moyen Âge. Actes du XVe colloque du Comité international de paléographie latine (Vienne, 13–17 septembre 2005)*, ed. by Otto Kresten and Franz Lackner. Vienna: Verlag der ÖAW, 2008, 87–94.

Gumbert, J. Peter. "Sizes and Formats." *Ancient and Medieval Book Materials and Techniques*, ed. by Marilena Maniaci and Paola F. Munafò. Vol. 1. Studi e testi 357. Città del Vaticano: Biblioteca Apostolica Vaticana, 1993, 227–263.

Hufnagel, Silvia. "Der Wechsel von Pergament und Wachstafeln zu Papier in Island im 15. und 16. Jahrhundert." *Gutenberg-Jahrbuch* 95 (2020): 176–191.

Hufnagel, Silvia. "The Rise of Paper: An Overview of Paper Provenance and Use in 15th- and 16th-Century Iceland." *Paper Stories – Paper and Book History in Early Modern Europe*, ed. by Silvia Hufnagel, Þórunn Sigurðardóttir and Davíð Ólafsson. Materiale Textkulturen 38. Berlin and Boston: De Gruyter, 2023, 15–46.

Jakob Benediktsson. "Some Observations on Stjórn and the Manuscript AM 227 fol." *Gripla* 15 (2004): 7–42.

Jóhanna Katrín Friðriksdóttir. "Manuscripts and Codicology." *A Critical Companion to Old Norse Literary Genre*, ed. by Massimiliano Bampi, Carolyne Larrington and Sif Ríkharðsdóttir. Cambridge: Cambridge University Press, 2020, 89–111.

Jónas Kristjánsson. "Vellum and Literature." *Skarðsbók: Codex Scardensis AM 350 fol.*, ed. by Jónas Kristjánsson, Ólafur Halldórsson and Sigurður Líndal. Manuscripta Islandica Medii Ævi 1. Reykjavík: Lögberg, 1981, 39–45.

Kestemont, Mike et al. "Forgotten Books: The Application of Unseen Species Models to the Survival of Culture." *Science* 375 (2022): 765–769.

Kjeldsen, Alex Speed. *Filologiske studier i Kongesagahåndskriftet Morkinskinna*. Bibliotheca Arnamagnæana Suppl. 7. Copenhagen: Museum Tusculanum Press, 2013.

Kremer Pigmente GmbH & Co. KG, http://kremer-pigmente.com/en/shop/pigments/11553-set-iceland-earthcolours-assortment.html (accessed 3 October 2024).

Lethbridge, Emily. "Gráskinna: Material Aspects of a Pocket, Patchwork Njála." *New Studies in the Manuscript Tradition of* Njáls saga*: The* historia mulita *of* Njála, ed. by Emily Lethbridge and Svanhildur Óskarsdóttir. Kalamazoo: Medieval Institute Publications, 2018, 55–85.

Lethbridge, Emily. "Manuscript and Textual Culture." *The Cambridge History*

of Old Norse-Icelandic Literature, ed. by Heather O'Donoghue and Eleanor Parker. Cambridge: Cambridge University Press, 2024, 33–49.

Liepe, Lena. "Image, Script and Ornamentation in the 'Helgafell Manuscripts'." *From Nature to Script: Reykholt, Environment, Centre, and Manuscript Making*, ed. by Helgi Þorláksson and Þóra Björg Sigurðardóttir. Reykholt: Snorrastofa, Cultural and Medieval Centre, 2012, 245–271.

Liepe, Lena. *Studies in Icelandic Fourteenth Century Book Painting*. Reykholt: Snorrastofa, Cultural and Medieval Centre, 2009.

Lorenz, Tom. "Latin *in situ* Fragments Connected to Iceland: A Survey." *Scripta Islandica* 75 (2024): 61–93.

Lorenz, Tom. "Recycling and Recontextualisation in Medieval and Early Modern Icelandic Palimpsests." *Gripla* 35 (2024): 7–42.

Maniaci, Marilena. "The Structure of Atlantic Bibles." *Trends in Statistical Codicology*, ed. by Marilena Maniaci. Studies in Manuscripts Culture 19. Berlin and Boston: De Gruyter, 2022, 35–63.

Már Jónsson. "Fyrstu línur á blaðsíðum skinnhandrita: Fyrir ofan eða fyrir neðan efsta strik?" *Gripla* 13 (2002): 216–230.

Már Jónsson. "Manuscript Design in Medieval Iceland." *From Nature to Script: Reykholt, Environment, Centre, and Manuscript Making*, ed. by Helgi Þorláksson and Þóra Björg Sigurðardóttir. Reykholt: Snorrastofa, Cultural and Medieval Centre, 2012, 231–243.

Már Jónsson. "Megindlegar handritarannsóknir." Ezio Ornato. *Lofræða um handritamergð: Hugleiðingar um bóksögu miðalda*, trans. by Björg Birgisdóttir and Már Jónsson. Reykjavík: Sagnfræðistofnun Háskóla Íslands, 2003, 7–34.

Ommundsen, Åslaug and Gisela Attinger. "Icelandic Liturgical Books and How to Recognize Them." *Scriptorium* 67 (2013): 293–317.

Parsons, Katelin M. "Relics of the Past: Calfskin, Authenticity and Nordic Antiquarianism." *Manuscript Studies* 9/2 (2024): 268–292.

Plahter, Unn. "Líkneskjusmíð: Fourteenth Century Instructions for Painting from Iceland." *Zeitschrift für Kunsttechnologie und Konservierung* 6 (1992): 167–173.

Plahter, Unn. *Painted Altar Frontals of Norway 1250–1350*. Vol. 2: *Materials and Technique*, with contributions from Bjørn Kaland, Katharina von Salis, Sophie Stos and Raymond White. London: Archetype Publications, 2004.

Pokorny, Lea D. "Consistently Inconsistent: Constructing Gatherings in Fourteenth-Century Iceland." *Manuscript Studies* (forthcoming).

Pokorny, Lea D. "Correcting Icelandic Manuscripts in the Second Half of the Fourteenth Century: Techniques and Context." *Scripta Islandica* 75 (2024): 123–166.

Pokorny, Lea D. "Pricking, Ruling, Helgafell? Book Production, Its Features, and Its Circumstances." *Book Production at Helgafell? New Perspectives on a Suspected Scriptorium in 14th-Century Iceland*, ed. by Beeke Stegmann and Þórdís Edda Jóhannesdóttir. Reykjavík: Stofnun Árna Magnússonar í íslenskum fræðum (forthcoming).

Pokorny, Lea D. "Skrifari og listamaður: Falið andlit í AM 226 fol." *Árnastofnun*, 22 April 2022, arnastofnun.is/is/utgafa-og-gagnasofn/pistlar/skrifari-og-listamadur-falid-andlit-i-am-226-fol (accessed 4 October 2024).

Rannver H. Hannesson. "Analyser af islandske pergamenter." Kanditatspeciale, Konservatorskolen. Det kongelige danske Kunstakademi. Copenhagen, 1995.

Soffía Guðný Guðmundsdóttir and Laufey Guðnadóttir. "Book Production in the Middle Ages." *The Manuscripts of Iceland*, ed. by Gísli Sigurðsson and Vésteinn Ólason. Reykjavík: Árni Magnússon Institute in Iceland, 2015, 45–61.

Springborg, Peter. "The Care Taken by Árni Magnússon of the Manuscripts in his Collection: A Study of Records." *Care and Conservation of Manuscripts* 2 (1996): 11–20.

Springborg, Peter. "The Work of Conservation at the Arnamagnæan Institute." *Care and Conservation of Manuscripts* (1995): 41–52.

Stegmann, Beeke. "Collaborative Manuscript Production and the Case of Reykjabók: Paleographical and Multispectral Analysis." *New Studies in the Manuscript Tradition of* Njáls saga: *The* historia mutila *of Njála*, ed. by Emily Lethbridge and Svanhildur Óskarsdóttir. Kalamazoo: Medieval Institute Publications, 2019, 29–54.

Stegmann, Beeke. "Manuscript Production and Writing Culture in Iceland." *World in Words: A Manuscript Exhibition in Edda*, ed. by Þórdís Edda Jóhannesdóttir. Reykjavík: Stofnun Árna Magnússonar í íslenskum fræðum, 2024, 94–103.

Stegmann, Beeke. "Papierforschung im Dienste der Buchgeschichte: Einbände des 18. Jahrhunderts in der Handschriftensammlung Árni Magnússons." *Paper History*, 29/1 (2025): 7–16.

Stegmann, Beeke, Lea D. Pokorny and Giovanni Verri. "Revisiting a Scribal Network Based on Rubrics." Oral presentation delivered at Leeds International Medieval Congress, held in Leeds, 3–6 July 2023.

Szirmai, J. A. *The Archaeology of Medieval Bookbinding*. Ashgate: Routledge, 1999.

Vnouček, Jiří. "The Parchment of Flateyjarbók." Oral presentation delivered at the seminar Flateyjarbók: forn og ný, held in Reykjavík on 10 February 2023; recording available online: youtube.com/watch?v=pQVb3PR64ME (accessed 29 September 2024).

Vnouček, Jiří, Matthew Teasdale and Sarah Fiddyment. "Parchment of Icelandic Manuscripts." Oral presentation delivered at the 19th International Seminar on the Care and Conservation of Manuscripts held in Copenhagen 19–21 April 2023; abstract available at https://nors.ku.dk/cc/programme-cc-19/ (accessed 14 February 2025).

Westergård-Nielsen, Chr. "Introduction." *Skálholtsbók eldri: Jónsbók etc. AM 351 fol.*, ed. by Chr. Westergård-Nielsen, Early Icelandic Manuscripts in Facsimile 9. Copenhagen: Rosenkilde and Bagger, 1971, 9–61.

Zorzan, Giulia. "The Colourful Codex." *Book Production at Helgafell? New Perspectives on a Suspected Scriptorium in 14th-Century Iceland*, ed. by Beeke

Stegmann and Þórdís Edda Jóhannesdóttir. Reykjavík: Stofnun Árna Magnússonar í íslenskum fræðum (forthcoming).
Zorzan, Giulia et al. "Not Quite *ultima Thule*: A Voyage into the Colorants of Medieval Icelandic Manuscripts." Oral presentation delivered at the 20th International Seminar on the Care and Conservation of Manuscripts, held in Copenhagen 9—11 April 2025. Abstract available at https://nors.ku.dk/cc/cc20-programme/ (accessed 11 February 2025).
Þórarinn Hjartarson. *Skinna. Saga sútunar á Íslandi*. Reykjavík: Hið íslenzka bókmenntafélag, 2000.

SUMMARY

Manuscript Production in Iceland: A State of Knowledge

Key words: manuscript production, Icelandic manuscripts, material codicology

The present contribution provides a state of knowledge for manuscript production in Iceland. It is structured thematically, discussing both publications and ongoing research on (1) writing support, (2) gatherings and design, (3) writing and embellishment and (4) bindings and seals. Traditionally, the methods of book production in Iceland have been considered largely comparable to European practices, although the materials were thought to have been sourced mainly locally. Slowly, assumptions are being replaced with results from material-codicological studies. In fact, recent years have seen a significant increase in scholarly attention on the specifics of Icelandic manuscript production, allowing us to understand better both parallels with and differences from other European traditions. Technological advances and interdisciplinary approaches have particularly benefitted scholarly progress, such as for the identification of various materials. While the fourteenth century has been relatively well covered by research, other periods remain less explored.

ÁGRIP

Handritagerð á Íslandi: staða þekkingar

Efnisorð: handritagerð, íslensk handrit, efnisleg handritafræði

Þessi grein veitir yfirlit yfir stöðu þekkingar á handritagerð á Íslandi. Henni er skipt niður í efnisflokka þar sem dregnar eru saman niðurstöður rannsókna sem nýlega hafa birst í fræðiritum og rannsókna sem enn eru í vinnslu um 1. blaðefni, 2. kver og síðuhönnun, 3. skrift og skreytingar og 4. bókband og innsigli. Menn hafa lengi unnið út frá þeirri tilgátu að aðferðir íslenskrar handritagerðar hafi að miklu leyti verið sambærilegar við það sem gerðist annars staðar í Evrópu en að efnið hafi einkum verið fengið innanlands. Undanfarin ár hafa niðurstöður

rannsókna á efnislegum þáttum smám saman komið í stað ágiskana. Athygli fræðimanna hefur í auknum mæli beinst að sérstöðu íslenskrar handritagerðar og þannig hefur skilningur aukist á því hvað er sambærilegt og hvað er ólíkt handritagerð annars staðar í Evrópu. Tækniframfarir og þverfaglegar aðferðir hafa reynst sérstaklega gagnlegar, einkum við greiningu á efnisvali og verkferlum. Hingað til hafa rannsóknir fræðimanna aðallega beinst að handritagerð á fjórtándu öld á meðan eldri og yngri tímabil bíða enn frekari greiningar.

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