

# NOTES ET MATÉRIAUX

## THE BOOK OF ARMAGH: A CODICOLOGICAL REASSESSMENT

John GILLIS

The Book of Armagh (Dublin, Trinity College, TCD MS 52) is an early ninth-century composite vellum manuscript from an Insular orbit. Its contents include a complete copy of the New Testament, along with documents relating to St Patrick and St Martin of Tours. The manuscript has been attributed to the scribe and artist Ferdomnach, whose name appears on its pages. One inscription records that the manuscript was produced for Torbach, who was Abbot of Armagh for just one year in 807. This colophon allows for an atypically accurate dating for its production. Two additional items have been historically associated with the Book of Armagh; a fifteenth-century, highly decorated leather satchel and a pair of oak binding boards, considered to be the original boards of the manuscript. Expert examination of these boards thus far includes two studies, over twenty years apart, neither of which was published in detail. This paper intends to address the lack of codicological details relating to the boards and examine the possible scenarios as to their intended original function as they relate to the manuscript.

This paper presents a detailed report on the codicological, decorative and structural features of a pair of timber binding boards which have long been associated with the Book of Armagh (Dublin, Trinity College, TCD MS 52), an early ninth-century Irish manuscript, historically highly significant<sup>1</sup> (**Pl. 32a**). There are three parts to this Latin manuscript, a complete New Testament (f. 25-190 – the largest part), documents relating to St Patrick (f. 1-24), and the life of St Martin of Tours by Sulpicius Severus (f. 192-222). The colophon of the principal scribe, Ferdomnach, makes an accurate dating of the manuscript possible, as he states that he was writing for Torbach (*dictante Torbachi* f. 53v). Torbach, abbot of Armagh, held office only for the year 807. A Gospel book in the possession of a later abbot, Máel Brigte Mac Tornáin or MacDurnan (d. 927), is believed to be also the work of

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(1) Jonathan J. G. ALEXANDER, *Insular Manuscripts 6<sup>th</sup> to the 9<sup>th</sup> Century*, London, 1978, p. 76. Bernard MEEHAN, «Art of Worship and Devotion», in *Art and Architecture of Ireland, Medieval c.400-c.1600*, ed. Rachel Moss, Dublin, 2014, p. 276. Timothy O'NEILL, *The Irish Hand, scribes and their manuscripts from the earliest times*, Cork, 2014, p. 20. William O'SULLIVAN, «Manuscripts and palaeography», in *A New History of Ireland, Vol. I. Prehistoric and early Ireland*, ed. Dáibhí Ó CRÓININ, Oxford, 2005, p. 536.

Ferdomnach<sup>2</sup>. The death of Ferdomnach «scholar and excellent scribe» is recorded in the *Annals of Ulster* for 845<sup>3</sup>. Richard Sharpe identifies two additional scribes in the Book of Armagh, scribe A and B<sup>4</sup>. E.A Lowe was also of the opinion that more than one scribe contributed to the book<sup>5</sup>.

## History of manuscript

In 937 the *Annals of the Four Masters* record the enshrining of the Book of Armagh:

«Canoin-Pháttraice do chumhdach lá Donnchadh, mac Floinn, rí Ereann».  
Canoin-Phadraig was covered by Donnchadh, son of Flann, King of Ireland<sup>6</sup>.

The enshrinement was intended to raise the status of the manuscript to that of a relic of St Patrick. Additionally, there were fraudulent attempts to associate the manuscript directly with the hand of the saint. From this time, the Book became part of the abbatial insignia of the church of Armagh. The enshrinement is not without precedent given that Donnchadh's father, Flann Mac Sechnaill, commissioned a shrine for the Book of Durrow (Dublin, Trinity College, TCD MS 57), believing that manuscript to be a relic of St Colum Cille. It is known that the latter structure survived until the seventeenth century<sup>7</sup>.

The visit of Brian Bóruma to Armagh in 1005 is recorded in the manuscript and in 1134, a succession dispute resulted in the Book of Armagh being temporarily removed from the See. The MacMoyre family became the hereditary keepers in the fourteenth century and had charge of it until 1680 when Florence MacMoyre (who autographed the manuscript on f. 105v) disposed of the book in unhappy circumstances.

In 1707, the Book of Armagh was in the possession of Arthur Brownlow (1644-1712) of Lurgan Co. Armagh. In the same year Edward Lhuyd, Keeper of the Ashmolean Museum in Oxford published his *Archaeologia Britannica* with an additional catalogue of Irish manuscripts. He listed the Book of Armagh in his publication, but included no details, although he had collected information on the

(2) Michelle P. BROWN, *Art of the Islands*, Oxford, 2016, p. 148.

(3) *Annals of Ulster, otherwise ... Annals of Senat*, ed. and transl. W. M. HENNESSY and B. MACCARTHY, Dublin, 1901.

(4) Richard SHARPE, «Palaeographical Considerations in the Study of Patrician Documents in the Book of Armagh», *Scriptorium*, 36, 1982, p.3, à la p.28.

(5) Elias Avery LOWE, *Codices Latini Antiquiores*, Part II: *Great Britain and Ireland*, Oxford, 1935, p. 42.

(6) John O'DONOVAN (ed.), *Annals of the Kingdom of Ireland by the Four Masters*, Vol. II. Dublin, 1856, p. 639.

(7) An inscription on the silver cover of the manuscript was recorded by the antiquary Roderick O'Flaherty in 1677, cf. Rachel Moss, *The Book of Durrow*, London, 2018, p. 88.

manuscript, probably during his expeditions through Ulster in 1699-1700<sup>8</sup>. Lhuyd died in 1709 but it was only when his papers were discovered and published by Rev. Charles O'Connor in 1813 that his detailed account of the Book of Armagh was seen. Lhuyd records how Arthur Brownlow reordered and renumbered the disheveled manuscript, and of particular interest is his mention of the binding and accompanying satchel<sup>9</sup>:

«Non sine magno labore, disjuncta tunc folia debito suo ordine struxit, numeros in summo libri posuit folia designantes, aliosque in margine addidit capita distinguentes, eademque folia sic disposita prisco suo velamina (ut jam videre licet) compingi curavit, et in prisca sua theca conservari fecit, una cum bulla quadam Romani pontificis».

«Not without great labour he ordered the disbound folia. He numbered the designated folia on the top of the book, added other [numbers] in the margin distinguishing chapters. At the same time he arranged the ordered folia *in their ancient covering* put together with care (as we may now see) *in their ancient case [envelope/sheath]* together with a bulla [seal] of the Roman pontiff»<sup>10</sup>.

No mention is made of a book shrine and the text suggests the manuscript was in poor condition and without a functioning binding. If Brownlow had the manuscript rebound after his reordering, this could be the event that resulted in the studded, brown vegetable tanned leather binding over the original oak boards (see below).

The Brownlow family's custody of the Book of Armagh is well-documented. In 1836 the manuscript was advertised to be sold by auction but was subsequently withdrawn. Ten years later it was deposited in the Royal Irish Academy, presumably with its satchel, although the latter is not mentioned in the Academy's Proceedings<sup>11</sup>. At this time the owner was William Brownlow, of Knapton, Abbey-leix, Co. Laois. In 1853 the Irish scholar, William Reeves, Bishop of Down, purchased the manuscript from Brownlow for £300 and the following year sold it on to Lord John George Beresford, Archbishop of Armagh and Chancellor of Dublin University, who deposited it in Trinity College<sup>12</sup>. In May 1884 Dr John Kells Ingram (1823-1907), then College Librarian, had the manuscript rebound<sup>13</sup>, and the work was carried out by «C. Bigger» most likely in the establishment of James Bigger, Bookbinder, 61 New Street, listed in the 1847 Dublin Almanac.

(8) Stephen BRIGGS, «Edward Lhuyd's expeditions through Ulster, 1699 and 1700» in *The Modern Traveller to our Past: festschrift in honour of Ann Hamlin*, ed. Marion MEEK, Belfast, 2006, p. 384-393.

(9) John GWYNN, *Liber Ardmachanus. The Book of Armagh*, Dublin, 1913, p. CXII.

(10) Translation T. O'NEILL (emphasis mine)

(11) *Proceedings of the Royal Irish Academy Dublin (1836-1869)*. Vol. 3, Dublin, 1847, p. 259-260.

(12) William REEVES, *Proceedings of the Royal Irish Academy Dublin (1889-1901)*. Vol. 2, Dublin, 1901, p. 77-99.

(13) Dublin, Trinity College, TCD MUN/LIB/2.

At this stage, the original boards, covered in the once studded leather-work, must still have been attached to or at least accompanying the manuscript, as Bigger was inclined or instructed to remove the leather and mount it inside the boards of his new binding as *doublures*. We know from a description by Sir William Betham, that by 1827 the studs had already been removed. Fortunately, and historically untypically, rather than discarding them, the binder returned the timber boards to Trinity College, with the manuscript.

In 1957 Trinity College contracted Roger Powell to rebind the Book of Armagh. He described the nineteenth-century binding on the manuscript as he received it as being:

«Produced by stationary binding techniques. The sewing was on three vellum strips the thread passed right around the strips and not merely over them. Vellum end leaves had brown morocco strips stuck outside them at the joints and carried onto the boards. Stuck on the inside of the boards were, what were presumably the sides of an earlier (the original ?) binding»<sup>14</sup>.

Although the folio size of the manuscript (195 × 145 mm), is small enough for it to be classified as a Pocket Gospel its substantial girth prompted Powell to divide it into two volumes, despite the misgivings of its custodians in Trinity College Library. He quoted «not more than £100» for his rebinding and the work was carried out in the British Museum, by arrangement, along with another Trinity manuscript, The Book of Dimma (Dublin, Trinity College, TCD MS 59)<sup>15</sup> (**Pl. 32b**).

### The Text block

The pricking and ruling throughout the manuscript are best described as discreet, apart from the Pauline Epistles, on six quires from folio 105 to 149. Here the method employed means the clarity of the ruling fades incrementally after the clear furrows and holes on the first folio of each of the six quires. The fading results from the insular tradition of carrying out the pricking and ruling after the quire has been folded and assembled, in an attempt to mark-up several folia at one time. I have never been convinced of the success of this system and have observed evidence in a number of insular manuscripts where the scribe needed to pick up the faint line or pricking hole after a few folia and renew the process to the end of the quire. One such example is the aforementioned Book of Dimma. This approach to preparing a quire is further evidenced by pricking holes appearing on both the inner margins and the fore-edges.

There is some variance in the «feel» and standard of the skins, and in the quality of the surface preparation by the scribe, but in a manuscript of over two hundred folia, this may be expected.

(14) Dublin, Trinity College, TCD MS 10525/1/130.

(15) *Ibid.*



The two-column layout in the Book of Armagh is maintained in each of the three parts of the manuscript and there is also uniformity in the margins, with the exception of the first part of the Martiniana (f. 191-212). Here scribe A increases the inner margin upsetting the balanced appearance of the folia but when Ferdomnach takes over at folio 213, he restores the margin widths. The book's twenty-seven quires of vellum are made up in a typically «ad hoc» Irish manner, with quires containing different numbers of leaves and no adherence to any convention in relation to the arrangement of hair and flesh sides. The material is calfskin vellum throughout. Folio 1 from the Patrician documents is lost and four folia (two bifolia) from the centre of quire six in the New Testament are also missing (see appendix 3, p. 337).

### The Composite Nature of the Manuscript

The combining of separately written texts might have required the trimming of the larger folia to match the smaller in order to produce a solid book block. Such trimming may be contemporary or at a later date, occurring at the time of a second or even third rebinding. In later centuries, particularly with secular manuscripts, the various parts were often left in their original format, creating an uneven book block and some creative sewing systems.

Some scholars suggest that the Book of Armagh was originally in use as a collection of individual works or «booklets», pointing to the fact that the arrangement of the quires facilitates their separation (see appendix 3, p. 337). Gwynn went further, dividing the New Testament into four parts, based on a complete quire or quires<sup>16</sup>. Kenney suggested that the codex like many texts in an Irish monastic setting, originally remained unbound and in use for a considerable period as booklets<sup>17</sup>; based on this, Richard Sharpe speculated whether the wooden boards originally only bound part of the manuscript<sup>18</sup>. Though the contents and the quire arrangement of the Book of Armagh suggests its sections could have been used separately, the crucial evidence of wear and soiling is lacking. In the 1960 issue of *Scriptorium*, Ludwig Bieler reviewed the study of Richard Irvine Best's 1958 article in *Eriu*, with emphasis on the palaeography and possible exemplars. Observations were also made regarding assembly of the manuscript, including comments from William O'Sullivan<sup>19</sup>.

The composite nature of the Book of Armagh is not untypical in the context of early medieval Irish manuscripts; the Stowe (Lorrha) Missal (Dublin, Royal Irish Academy, RIA MS D ii 3) and the Book of Mulling (Dublin, Trinity College, TCD

(16) J. GWYNN, *The Book of Armagh* (*supra* n. 9), p. xiv.

(17) James F. KENNEY, *Sources for the Early History of Ireland: an introduction and guide*. Volume 1: *Ecclesiastical*, New York, 1929, p. 338.

(18) R. SHARPE, «*Palaeographical Considerations...*» (*supra* n. 4), p. 8-12.

(19) Ludwig BIELER, «Bulletin Codicologique», *Scriptorium*, 14, n° 2, 1960, n° 477, p. 354-356.

MS 60) are two further examples, and all three are in the «Pocket Gospel» category. However, there are no telltale signs of the individual manuscript parts of the Book of Armagh being in separate use over an extended period, the evidence typically in the form of considerable soiling and abrasion on the first and last folia, a result of their function as covers for each part. Soiling and abrasion are present however, on folio 12 and 13 respectively, these are the last and first folia of the two quires of the Patrician texts, historically the most significant part of the manuscript.

## **The Book of Armagh binding events**

### ***Tacketing***

Evidence in the form of primary tacketing or stab tackets, a technique to hold the single quire or multiple quires together would provide a secondary indicator of separate booklets and although the stitching material may be lost, holes would remain as proof, plus an occasional «ghost impression» left by a thread or cord on the surface of the skin. However, to find this evidence full access to the spine-folds<sup>20</sup> of the quires is essential, particularly the central bifolia. Ideally a manuscript needs to be disbound for such a study, as was the case recently with the Book of Dimma, when significant new codicological information was gathered while rebinding<sup>21</sup>.

When Roger Powell rebound the Book of Armagh in 1957 he merely stated «there is ample evidence from old sewing holes to show that the book consists of several items united in one volume»<sup>22</sup>. Unfortunately, he decided, based on the cost and time involved, not to record the work in the same detail as when he rebound the Book of Kells, four years earlier. But when pressed on the matter by William O'Sullivan in 1962, he recalled that some notes were taken.

However, when I attempted to track down this correspondence I discovered that Powell's archive is now housed in the Lilly Library of Indiana University and is currently (2020) unavailable.

In the 1980's Anthony Cains, Director of the Conservation Department in Trinity College Dublin until his retirement in 2002, examined the backfolds of the Book of Armagh on separate occasions, gathering data despite the restrictions of the bound volumes. He too corresponded with Powell, requesting any notes made during the rebinding. Powell confirmed: «I have clear recollection of believing that Armagh had at one time been in three volumes; there seemed to be three groups of sewing holes that did not run through the whole».

(20) Language of the Book, [www.ligatus.org.uk/lob/](http://www.ligatus.org.uk/lob/), consulted 23/06/2022.

(21) John GILLIS, Bernard MEEHAN, «Examining the Book of Dimma», in *An Insular Odyssey Manuscript Culture in Early Christian Ireland and Beyond*, ed. Rachel Moss et al., Dublin, 2017, p. 86-113.

(22) Dublin, Trinity College, TCD MS 10525/1/287.

Based on his own investigations, Cains assigned the perforations and sewing holes he recorded to five binding events. Re-examining the Book of Armagh recently, I reviewed Cains's observations, and corroborated these events through surviving components of the various bindings<sup>23</sup>.

Tacketing is a method of quire attachment that reaches back to the Late Antique period and the emergence of the codex itself. Basically designed to keep the bifolia of a single quire codex together, it developed into a system to connect the multi-quire codex to some form of cover<sup>24</sup>. Evidence of tacket use survives in some manuscripts of the early medieval period, where it was used by the scribe to keep the individual quires together before binding. Occasionally bookbinders left the tackets in place and did not use their stations (holes) for the subsequent sewing. Notwithstanding, there is good argument that the tacket served a function beyond keeping folia in place for the bookbinder, rather it served to put individual quires into use, as exemplars or didactic material without an attached structure<sup>25</sup>.

### ***Tacketing and the Book of Armagh***

Typically, the system involves piercing a pair of holes in close proximity, passing the tacketing material through both and knotting or twisting it to secure the bifolia. If more than one tacket is used, it would suggest a function other than keeping a quire together before sewing, and rather that the manuscript or the part so fixed, could be used in that form. Significantly, this is the case with the Book of Armagh, which has three tackets per quire. Here, the tacket is not pierced through the spine-fold but rather a little way in (2 to 3 mm), by a piercing tool held vertically rather than horizontally, in a kind of «stabbing» motion. This side stabbing allows multiple quires or single folia to be joined in the one action and was the method of choice of the Armagh scribes. This is fortunate, as unlike tacketing through the backfold, the stabbing holes cannot be confused with possible sewing station holes, neither can they be used as sewing stations themselves and so can be positively identified as tacket holes.

Anthony Cains recorded his observations of stabbing perforations in the Book of Armagh as follows:

Each gathering has quire stitch stab perforations or slits generally two at the head two at the center and two at the tail. The variation in the spaces of holes and the shape and oxi-

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(23) Tony Cains was this author's mentor and teacher for two decades, who, after his retirement in 2002 generously offered me access to his notes and full permission to reproduce his findings. His work will be acknowledged where it appears in this paper. Tony sadly passed away in November 2020, this paper as well as owing much to his observations is dedicated to his memory.

(24) Brent NONGBRI, *God's Library The Archaeology of the Earliest Christian Manuscripts*, New Haven, 2018, p. 29-30.

(25) Johan Peter GUMBERT, «The Tacket Quire: An Exercise in Comparative Codicology», *Scriptorium*, 65, 2011, p. 299-320.

ation staining can possibly be linked to the three scribes identified by Sharpe. I detect a difference in the tool used and the spaces between scribe F and A/B<sup>26</sup>.

Recently, in connection with a brief examination of the manuscript I looked again at Cains's tracings of the perforations and his linking of the different stab holes to Sharpe's three scribes<sup>27</sup>. It seems clear that though Ferdomnach might have been the most accomplished of the scribes in the Book of Armagh, he was the least disciplined when it came to tacketing his quires. His work on the New Testament (quires 4 – 14) is irregular for both the spacing and the angle of his perforations. In contrast, scribes A and B (quires 15 – 22), perhaps following some workshop standard, produce perforations with a vertical puncture that are neat and regular. However, quires 23, 24 and 25 containing the Acts of the Apostles and the first quire of Martiniana, all the work of scribe A, do not display any stab holes suggesting that this section did not function independently as a booklet.

The perforations, three groups of two in each quire, are «slit-like» and between 2 and 3 mm long, and were most likely made with the tip of a blade, at least by scribes A and B. Ferdomnach seems to have used a different implement, as the perforations are smaller and are often accompanied by a halo of corrosion, likely trace elements of the piercing tool.

### ***Analysis of the tacket work***

Examining the tacket work in the Book of Armagh I formed the opinion that this operation was intended to keep the individual quires together and not to attach one quire to the next. This observation is based on the lack of expansion of the perforations that would have resulted from both the implement and the stitching material, typically a parchment thong or vegetable fibre, being pushed through several folia of vellum, which would have expanded further with time. Although one or perhaps two, side-stabbed ticketed *quinions* or *quaternions* will function as a pamphlet/booklet and be reasonably usable, multiple quires bound together in this way will not, as the restricted opening would be uncooperative in use.

It was nevertheless interesting to observe that when a tracing of a set of stabblings in one quire was overlaid on the two or three quires on either side, the alignment was very close. This might suggest they were once connected but could also be explained by good workshop practice. I used quires 15 – 22, the work of scribes A & B, as the same uniformity would characterise such work today.

Having already observed the unsoiled appearance of the individual parts of the manuscript, it is reasonable to suggest that each group of side-stabbed quires was kept in some form of protective but unattached cover. The Faddan More Psalter (NMI 06 EO 786), with its single piece structure, comes to mind as an example of this practice.

(26) Hand-written notes given to the author by Anthony Cains.

(27) R. SHARPE, «*Palaeographical Considerations...*» (*supra* n. 4), p. 8-12.

***The sequence of binding events***

Although now obscured by the Powell sewing, Cains located the position of the first binding event in the spine-folds. He could identify some thread impressions in the centre of a quire that aligned and matched with the attachment points on the timber boards. This allowed him to locate the kettle stitch or changeover points for the threads, establishing the four stations (two sewing supports and two changeover) used for the original alum tawed and oak board binding. If the location of these four stations in every quire could be identified, it would determine how much of the Book of Armagh was originally bound between the extant oak boards. Unfortunately, it is impossible to be certain of this. When Powell rebound the manuscript in 1957, he adopted the sound conservation practice of employing existing sewing stations rather than creating additional holes. Although unaware of the existence of the oak boards, he chose the stations that had been employed for the original binding (plus one from the nineteenth-century sewing). The question remains, however, as to whether these stations existed throughout the manuscript or whether Powell had sometimes to make new holes. In my opinion, Powell chose as his model the most abundant set of existing sewing stations, which were to be found in the largest part of the manuscript, namely, the Gospels. This then supports the hypothesis that it was only the four Gospels that were originally bound between the Armagh boards.

The three additional binding events Cains recorded were:

1. A crude resewing on four vegetable fibre cords, the fragmentary remains of which can be seen with their corresponding holes on the oak boards. Only two of the four cords were laced in. This sewing is most likely part of the studded leather binding.
2. The nineteenth-century binding by Bigger, commissioned by Trinity College Library sewn on three parchment thongs, utilising two of the sewing holes from the previous binding.
3. The Powell binding, also commissioned by Trinity, which as noted above, utilised only or mostly existing holes.

**Analysis of the sequence of bindings of the Book of Armagh based on a detailed examination of the surviving boards**

***The first binding event: a carolingian-style binding***

The extant boards of the Book of Armagh are made of oak and measure 200 × 155 mm and are approximately 6 mm thick. They are quarter sawn, the most typical and stable cut used by the medieval bookbinder. The boards display characteristics known today as «carolingian», so called because of its widespread use in the heyday of the Frankish Dynasty and characterized by the first use of

sewing supports, in the Western tradition<sup>28</sup>. Technical changes took place in different centres during the three hundred or so years of that era, but it is not possible to construct an accurate dating chronology based solely on craft developments. The Armagh boards were first classed as carolingian by Berthe Van Regemorter (1879-1964), the Belgian-born bookbinder, who examined them in the British Museum in 1961. She pointed to the V-shaped channels cut into the surface of the boards and their associated tunnels in the board edge; two sets for each board determine that two sewing stations were used to attach the manuscript to them. Remnants of the cord lacing remain in the channels (**Pl. 32c**). She also pointed to the fragments of red-stained alum-tawed covering material which had survived, particularly as turn-in leather on the inside of the board surfaces<sup>29</sup>. The Research Laboratory of the British Museum examined and conserved the boards. They incorrectly identified the alum-tawed leather as pigskin<sup>30</sup> and what remained of the nails in the nail holes as silver, which subsequently proved to be tin<sup>31</sup>. Fragments of the sewing supports in the channels were identified as linen. Most regrettable however was the conservation treatment, whereby all material fragments were stuck down to the timber boards and the boards consolidated with epoxy resin. This was noted by the Keeper of Manuscripts in Trinity College, William O'Sullivan on their return from London<sup>32</sup>. This treatment has ever since hindered the examination of the boards.

The attachment system of the Armagh boards fits into Type I of Szirmai's and others' categorization of carolingian bindings<sup>33</sup>. This includes the bifurcated lacing system into oak boards and the use of, typically, but not exclusively vegetable fibre supports. This system did not require the use of a sewing frame to suspend the supports; rather, the supports were first attached to the left/front board, the sewing of the text block followed and the supports secured in the right/back board after the book had been sewn. However, the choice of two sewing supports employed in the Armagh binding is untypical of Szirmai's study group, four supports being more usual. In fact, only three of 122 bindings recorded by him were sewn on two supports. Whether all twenty-seven quires or just the quires of the four gospels were the subject of the first sewing, the spine would undoubtedly have been lined with a covering material, either partially as tabs for the endbands or in one piece or three, adhered between the two sewing supports. No evidence of such linings can be detected beneath the current covering leather, or in any photographs during its re-binding. The spine would have been flat and not curved as was the later convention.

(28) János A. SZIRMAI, *The Archaeology of Medieval Bookbinding*, Aldershot, 1999, p. 100.

(29) Dublin, Trinity College, TCD MS 10525/1/286.

(30) An examination of the follicle pattern under magnification, points to the source material as most likely a kid or goat.

(31) A sample of a nail fragment was sent to the British Museum in 1984 and there analysed using x-ray fluorescence by Dr. Vincent Daniels. He confirmed that the only detectable element was SnO<sub>2</sub>, tin oxide, a corrosion product of tin.

(32) Dublin, Trinity College, TCD MS 10525/1/286.

(33) J. A. SZIRMAI, *The Archaeology of Medieval Bookbinding* (*supra* n. 28), p. 103.



*The Transition from Coptic-style binding*

In the context of Irish manuscripts and their bindings, the ninth-century Book of Armagh in its definitive western carolingian style demonstrates the transition from the Coptic influence on book-making methods, represented in Ireland by the late eighth century Faddan More Psalter and the Stowe Missal<sup>34</sup>. Additional evidence of this transition can be seen in a mid-ninth century manuscript in St Gallen (Cod. Sang. 904)<sup>35</sup>. This copy of Priscian's *Institutiones Grammaticae* with its 3 000 glosses in Old Irish is a product of a scriptorium in the north of Ireland, probably Nendrum. The manuscript is currently housed in a thirteenth-century brown tanned leather binding over a pair of oak binding boards. The pastedown on the right/back board is detached or lost, exposing the board attachment of three split alum-tawed sewing supports. Positioned on either side and between the current supports are four v-cut channels and associated holes of a previous carolingian sewing that confirm the reuse of the original boards in the later rebinding (Pl. 33a). These are very similar to the channels on the Armagh boards, apart from the staggered length of the channels, a technique to avoid creating a weakness along the length of the board.

Anthony Cains has contributed greatly to our understanding of the Armagh boards, in particular his work identifying the decorative patterns of the original covering and his reconstruction of the likely appearance of the original binding. What follows is his description of the sewing associated with the oak boards, after he produced a model based on his observations:

«The mark-up of the spine for sewing was made by dividing it into three equal panels to two cord stations and the first and last panels divided in half to give the kettle stitch positions. The front board formed the platform on which the text was sewn. The proof of this is that a continuous loop of thread runs through the tunnel and channel board attachment system of the front board and are [sic] twisted together at the back board inside channel. This channel is marginally wider to accommodate the double thickness. History would indicate that the sewing would have been a chain or link stitch, with the board attachment cords running through it by this. Practice on a model and our conservation work on skin texts indicate that this is a totally satisfactory method before the invention of the sewing frame. When the sewing was completed the double cords were passed through the tunnels bored into the thickness of the spine edge at an outward angle and exiting about 6 mm deep on the outer surface. The cords were then fixed, secured in the tunnel with a «peg» of soft tanned leather<sup>36</sup>. This bisected the tunnel and seized cords before completing the final stages of lacing-on. The two cords were then fitted into their respective channels which formed a V shape on the outer surface, the point

(34) John GILLIS, The Faddan More Psalter (PhD thesis, 2019). Pádraig O RIAIN, The Stowe Missal, *Treasures of the Royal Irish Academy*, Dublin, 2009, p. 11-16.

(35) J.J.G. ALEXANDER, *Insular Manuscripts* (*supra* n. 1), p. 85. T. O'NEILL, *The Irish Hand* (*supra* n. 1), p. 86.

(36) This is not a feature of other carolingian bindings and may be seen as a refinement of the binder – J. Gillis.

of the fork starting at the tunnel exit. The channels, about 15 mm long terminate with a perfect bored hole 3 mm diameter. The cords were passed each through the holes to the inside of the board, where another wider channel had been prepared-joining the holes and then twisted together several turns or half hitches, the cord ends were passed again to the outside and pulled tight. The holes were finally pegged with the surface of thread and peg cut flush»<sup>37</sup>.

### ***Endbands***

Additional structural holes in the Armagh boards are related to the sewing of endbands at the head and tail of the manuscript. The holes, two at each corner of the inside edges are angled and tapered and suggest a double cord passed over the head and tail of the book. Anchoring threads are sewn around these cords and through the centre of each quire, possibly in a herringbone fashion, the same stitch employed for the primary sewing of the manuscript. Typically, the spine linings would extend beyond the head and tail, forming tabs of leather and the end-band sewing thread would pass through these linings. The extended edges of the tabs and the covering material were sometimes joined by an edge stitching, often quite decorative. Variations of this carolingian-type endband have been recorded but there is no way of knowing which was employed for the Book of Armagh's first binding, as no spine lining or leather survives, but the double supported herringbone type is a strong candidate, based on existing examples. Although the channels in the boards between each set of holes have broken away, fragments of the core cord remain in the holes at the tail of both boards, and the knots preventing the cord from pulling through are located under the vellum pastedowns.

Cains expressed the opinion that the text block head and tail were «slightly back-cornered» a process where material was removed to allow the double cords of the endbands to recess slightly. This is not recorded as typical carolingian practice and would represent a further refinement in the binding process.

The thickness of the Armagh boards at 4 to 6 mm is also untypical of the findings of Szirmai's study group, his range of thickness measurements being between 7 and 17 mm, though he admits the difficulty of measuring the actual board thickness caused by the covering leather<sup>38</sup>. This feature combined with the minimal sewing stations of the Armagh boards suggest a structure and proportions appropriate to a small to medium-sized manuscript.

### ***Trimming***

Because the boards of the first binding of the Book of Armagh survive intact, we can state with a degree of certainty that the manuscript has not been trimmed

(37) Extract from unpublished notes kindly given to the author.

(38) J. A. SZIRMAI, *The Archaeology of Medieval Bookbinding* (supra n. 28), p. 112.

on subsequent rebinding episodes. This is confirmed by the current dimensions of the text block at 195 × 145 mm compared to the dimensions of the boards at 200 × 155 mm and the balanced appearance of the folio margins and their layout in relation to the text.

It is interesting to note that trimming, causing damage to text or decoration, was not always connected with rebinding. In the Book of Armagh at the head of folio 152r, the introduction to the epistle of Peter, written in the same hand as the text<sup>39</sup> has been sliced. As a codicological feature, it is evidence that early medieval text blocks were trimmed when bound initially and sometimes with the same disregard for the content as later rebinding episodes.

### ***Pastedowns***

Another interesting feature of the Armagh boards is the survival of the two velum pastedowns under the turn-ins of the first covering material, although now singletons. This feature is characteristic of carolingian binding practice and is a method of stabilizing the structure after attaching the back board once the sewing is completed. Typically, the pastedowns were the first and last folia of the first and last quires, left blank by the scribe for this purpose. Where this occurs, it suggests a coherence in the book-making process and an intent to bind the manuscript more or less immediately after writing had finished. Such original pastedowns rarely survive for scrutiny and though they may remain attached to their boards, they generally have lost their conjoint folia. Ragged inner edges on both Book of Armagh's pastedowns provide evidence for conjoint folia. Single folia were sometimes used as pastedowns, such as on the front board of the original binding of the St Cuthbert Gospel (London, British Library, BL Ad. MS 89000)<sup>40</sup>.

Pricking and ruling can also provide evidence for the use of conjoint folia particularly in the Insular tradition, where the quire is prepared, folded into its gathering and then marked up for writing. This would have resulted in the pastedowns displaying the same as the first and last quires of the text block. In the case of the Armagh manuscript, however, pricking and ruling barely feature throughout the manuscript and are not visible on the pastedowns. Cut marks are visible, that connect the pastedowns to the first binding event (there is further discussion of pastedowns relating to collation).

### ***Turn-ins***

The turn-ins surviving on the boards of the Book of Armagh present two further features typical of carolingian bindings. The first is the technique employed

(39) My thanks to Tim O'Neill for confirming this for me.

(40) Nicholas PICKWOOD, «Binding», in *The St Cuthbert Gospel; studies on the Insular Gospel of John*, ed. by Claire BREAY, Bernard MEEHAN, London, 2015, p. 46.

to miter the corners of the alum tawed skin; produced with a single cut and the edges butted together, with the knife cuts visible on the boards. Szirmai found this method present in over 76% of his study group and particularly prevalent in St Gall bindings. Secondly in 75% of the examples studied the edges of the turn-in material were left irregular and un-trimmed, and in 25% the edges were trimmed out.<sup>41</sup> The Armagh boards display both practices, with the front board trimmed out and the back un-trimmed (**Pl. 33b**).

### ***Fore-edge fastenings***

Fore-edge fastenings are a typical feature of carolingian bindings, but the original strapping systems rarely survive given the nature of their construction. This is the case with the Armagh boards and although components of two fore-edge straps survive, they are, for the most part, replacements of the original. Fastenings consists of a clasp, typically a leather strap attached to the front board by metal rivets, usually iron or bronze, under the covering material, with a refinement to recess the board to accommodate the strap. The other end of the strap has a ring or ring plate, generally of metal, occasionally of horn attached. Pegs, to anchor the ring, are driven into the edge of the back board, aligned with the straps.

Evidence of the fore-edge straps attached to the Armagh boards is in the form of redundant holes in the appropriate locations. The extant brass peg is a replacement item from a later period, but probably replicates the original. Contrary to the vast majority of carolingian bindings, the Armagh straps closed from the right/back board onto the left/front, that is, the pegs were located on the fore-edge, i.e thickness of the front board and the straps on the back, although it might be only the replacement peg was in this position, as the unusual structure of the Armagh boards fastening (see below) would allow for the positions to be swapped over. When Cains had the boards x-rayed in 1984 the images showed corroded fragments of the original clasp fittings remaining in the location sockets as well as a repair plate supporting the later peg on the front board (**Pl. 34a, 34b**). Interestingly there is no recess for the leather strap on the outside of the right/back board, or evidence of holding nails or rivets on the board surface, instead, the x-ray shows a tapered socket around the fixing pin, similar to those on the left/front board. This suggests something different to the double-thickness leather strap used for carolingian fastenings. Perhaps it resembled the thinner slit-braided leather straps of Coptic and Byzantine bindings and was attached to a metal fitting in the edge of the back board. The attachment of the metal pegs in the tang tapered holes, each secured with a single pin before covering suggests a competence in simple metalworking and neat workmanlike methods<sup>42</sup>.

(41) J. A. SZIRMAI, *The Archaeology of Medieval Bookbinding* (*supra* n. 28), p. 129.

(42) The larger holes visible on the x-ray are linked to the repairs.

*The covering of the oak boards*

The material surviving from the first covering of the oak boards consists of complete turn-ins and some fragments on the outer surface. It has a thickness of about 0.5 mm and is best referred to as «material» because strictly speaking, it is not leather but rather a type of tough skin, resulting from the ancient process of alum tawing. On the outer surfaces, the skin fragments are much degraded and abraded, however, the turn-ins, because of their protected position on the inside of the boards, provide an accurate indication of the appearance of the binding as originally executed and also demonstrate the extensive wear to the outer material through time and use.

The surface of the naturally white tawed goatskin has been dyed red, probably using an organic dyestuff (perhaps madder or kermes), and likely fixed with alum as a mordant. This salt was available in Ireland and would have been used in the preparation of the goatskin covering. The nature of this organic dye allows the white of the skin to influence the colour, resulting in a pinkish hue.

The same colour tone was noted in relation to the binding of another Irish medieval manuscript. When Sir William Betham (1779-1853) opened the book shrine of the Cathach (Dublin, Royal Irish Academy, RIA MS 12 R 33)<sup>43</sup> in 1813, he described the additional material he found inside as «a thin piece of board covered with red leather, very like that with which eastern manuscripts are bound»<sup>44</sup>. Betham later examined the Book of Armagh and published his findings in 1827 in his *Irish Antiquarian Researches*. He commented on the binding as follows:

«It has been bound in oak boards covered with black leather and was formerly covered either with silver plates or pins in the figure of a cross surmounted by a saltire surrounded by a border. The stumps of the silver pins still remain, and are very thick and strong - It appears to have had a previous covering of Crimson leather similar to the old Turkey, part of which still remains, and its front was fastened with brass loops - a part of one is still extant»<sup>45</sup>.

Betham does not refer to the binding fragment of the Cathach that he discovered some fourteen years earlier, despite the apparent similarities.

His description makes it clear that the stud-work was removed prior to 1827 and the covering with the black (actually brown) leather did not completely conceal the original red-dyed alum tawed fragments beneath. «Turkey leather» was the term generally used to describe the sumac-tanned goatskin, usually from

(43) The Cathach is the oldest extant Irish manuscript of the Psalter. Although there is no definite date for its production it has historically been linked to St Columba, but current thinking cast doubts on his authorship. It is dated to the late 6<sup>th</sup> or early 7<sup>th</sup> century.

(44) Dáibhí Ó'Cróinín, «The Cathach and Domnach Airgid», in *Treasures of the Royal Irish Academy Library*, Dublin, 2009, p. 6.

(45) William BETHAM, *Irish Antiquarian Researches*, Vol. 1. Dublin, 1827, p. 251.

sub-Saharan Africa, that was imported through Izmir in Turkey. It is likely that it was the red colour of the turn-ins that prompted Betham's erroneous description, as the imported Turkish and Moroccan skins were typically dyed red or green. The remains of the fore-edge pin that he comments on is the replacement one we see today.

### ***Red covered bindings***

Red-dyed alum-tawed skin may be considered the covering material of choice for early medieval Irish books. In addition to the Book of Armagh, the bindings of the Cadmug Gospels (Fulda, Landesbibliothek, Codex Bonifatianus 3) and the Stowe Missal (Dublin, Royal Irish Academy, MS D. II. 3) were covered with red-dyed alum-tawed skin. The manuscripts in question are both in the «Pocket Gospel» category<sup>46</sup>. In England, the remarkable eighth-century St Cuthbert Gospel displays the same red colour albeit here applied to the more traditional vegetable-tanned leather<sup>47</sup>.

The preference for red coverings is effectively demonstrated in *Codex Amiatinus* (Florence, Biblioteca Medica Laurenziana, MS Amiatinus 1), an enormous pandect bible of the eighth century<sup>48</sup>. On folio 5r the Jewish scribe Ezra is shown seated copying a manuscript. Beside him is a cupboard with the doors open, containing a nine-volume bible, all bound in red leather. Szirmai however, did not come across any red-dyed covers in his study of carolingian bindings. He found that most bindings were covered in «leather designated as «chamois» or «buck-skin»... [and]... «have a muddy yellowish-grey colour», a reference to oil-tanned skins. He does mention the use of alum-tawed skins, referring to them as «white skins» as these remained un-dyed<sup>49</sup>.

### ***Decoration of bindings***

The scarcity of contemporary bindings from the early medieval era naturally results in a dearth of knowledge as to how these covers might have been decorated, and we are dependent on contemporary illustrations such as those in Ezra's library for examples. At first glance, it would appear that the Armagh boards will not contribute much to improving matters, but closer inspection reveals the faint remains of blind-stamped tooling and panel work, suggesting a well-executed design. Szirmai places this type of carolingian cover decoration between the treasure bindings, with their elaborate metalwork, ivory and precious jewels and the plain

(46) Bernard MEEHAN, «The Irish Pocket Gospel Books», in *The St Cuthbert Gospel; studies on the Insular Gospel of John*, ed. by Claire BREAY, Bernard MEEHAN, London, 2015, p. 83.

(47) N. PICKWOOD, *The St Cuthbert Gospel* (supra n. 40), p. 52.

(48) Claire BREAY, Joanna STORY (eds.), *Anglo-Saxon Kingdoms: Art, Word, War*. London, 2018, p. 126.

(49) J. A. SZIRMAI, *The Archaeology of Medieval Bookbinding* (supra n. 28), p. 127.



unadorned leather covers, bearing little more than a title identifying the manuscript. He goes on to quote earlier surveys of blind-tooled carolingian bindings and concludes that none of the hundred plus recorded, is of western European manufacture. Both Waterer and Cameron state that there are no blind-tooled stamped English bindings before the twelfth century<sup>50</sup>; however, the Book of Armagh, the Cadmug Gospels<sup>51</sup> and the eleven carolingian bindings in St Gall, listed by Szirmai, confirm that, outside England, blind stamp tooled bindings were certainly being produced in the eighth, ninth and tenth centuries and on Coptic bindings a century before that. Jean Vezin also drew our attention to a number of French bindings from the same epoch, displaying stamped tooling on their original leather covers<sup>52</sup>.

There is still some debate as to how the process was carried out, particularly given the paucity of surviving tools used to execute the design. The question remains as to whether the tool was heated, as is the modern practice, or if pressure alone was used. A heated metal tool would require a handle of wood or non-conducting material for safe use. Such tools have been found, with the necessary tangs onto which a handle could be fitted. Other stamping tools have also survived, with evidence of impact from hammering on the straight shafts that shows how they had been used to impress the surface to be decorated. Stamping tools of copper alloy with the decoration motif cut in relief into the end of a shaft and a similar tool made from bone have been suggested as leather decorating tools<sup>53</sup>. Regardless of the methodology employed, the decorative motifs surviving on the leather fragments of the Book of Armagh are the earliest stamped decoration we have on an Irish manuscript binding. Dr. Paul Mullarkey of the National Museum of Ireland drew my attention to a leather fragment excavated from the Viking site on Fishamble Street in Dublin (N.M.I. Fishamble St., E172:2748). The 8 cm piece with a stamped cross inside a circle and blind line ruling has been suggested as the remains of a book cover (**Pl. 34c**). The date is uncertain and although excavated at a 10<sup>th</sup>- 11<sup>th</sup>-century level, it may well be earlier and there is no doubt that the required level of craftsmanship for such work was available at the time. In a discussion relating to combined skills of the craftsperson in medieval Ireland, Uaininn O'Meadhra considers leatherwork and manuscript illumination being executed by the same individual, in the same way as the metalworker and illuminator or scribe

(50) John W. WATERER, *Leather and Craftsmanship*, London, 1950, p. 52., Esther CAMERON, «Pre-Conquest Leather on English Book-Bindings, Arms and Armour, A.D 400-1100», in *Leather and Fur, Aspects to Early Medieval Trade and Technology*, ed. Esther CAMERON, London, 1998, p. 54.

(51) J.J.G. ALEXANDER, *Insular Manuscripts* (*supra* n. 1), p. 70. Bernard MEEHAN, «Appendix 3», in *The St Cuthbert Gospel*, ed. by Claire BREAY, Bernard MEEHAN, London, 2015, p. 164.

(52) John A. SZIRMAI, «Carolingian Bindings in the Abbey Library of St Gall», in *Making the Medieval Book: Techniques and Production*, ed. Linda BROWNRIGG, London, 1995, p. 172. Bernard C. MIDDLETON, *A History of English Craft Bookbinding Technique*, London, 1988, p. 165. Jean VEZIN, «Les reliures carolingiennes de cuir à décor estampé de la Bibliothèque nationale de Paris», *Bibliothèque de l'École des chartes*, 128 (1), 1970, p. 81–113.

(53) B. C. MIDDLETON, *A History of English Craft Bookbinding Technique* (*supra* n. 52), p. 165.

could be one and the same and points to training centres, three of them, including Armagh, in the north of Ireland<sup>54</sup>. Paul Mullarkey has long held the view that such craftspeople crossed disciplines<sup>55</sup>.

Cains took rubbings of the decorative tool-work on the alum-tawed fragments attached to the binding boards from which he produced detailed drawings of the three motifs. He also identified three decorative techniques; blind-tooled stamping (with three motifs), geometric interlacing and double line work (to divide the cover into panels). Based on this work he generated an image of what the finished cover may have looked like **Pl. 35a**. Commenting as follows:

«The cover is tooled with double blind lines dividing it into border panels on a centre panel which has been decorated with a carpet page pattern. From the evidence provided by fragments of the tooled or creased double lines in the central panel I have reconstructed the pattern of decoration from the surviving line fragments. Within the border panels are placed three distinct stamp designs. The «carpet page» double crease lines are so light in impress that I speculate that they are more in the nature of scribe lines as a guide to painting in color. The surface is damaged and there is no trace of pigment evident. I also discern other tool forms, a rounded or small circle within the carpet pattern and other fragments in border panels. [I append my drawings of these features.]».

Two of the stamp tool patterns can be considered insular in style, both containing forms of interlace ribbon. One has double field lines in a cordate or heart shape brought together at the top, where the two terminals meet and are rounded off. Inside the cordate shape is a triquetra, with one loop fitting neatly into the pointed end of the cordate shape. Cains located an early ninth-century French binding on a manuscript produced in St Denis, Paris, *Actes du concile de Chalcédoine* (Paris, Bibliothèque Nationale de France, lat. 11611)<sup>56</sup> where the cover is decorated with a combination of double blind line work and blind stamping. Cains identified two stamps on the cover, a filled cordate shape and a triquetra, making the observation that the cordate Armagh stamp is an amalgamation of both. The second stamp has an almost square border with double field lines, inside the space is an interlace pattern that could be described as four connected triquetras, their placement forming a cross from the background (**Pl. 35b**).

A more complex version of this motif can be found in the borderwork of two illuminated Irish manuscripts from the second half of the eighth century. In the Book of Dimma (Dublin, Trinity College, TCD MS. 59 p.104), on the page displaying the symbol of John within a decorated border, the pattern may be seen in both top and lower righthand corners (**Pl. 36**). A second example may be seen in the Irish

(54) Uaininn O'MEADHRA, *Early Christian, Viking and Romanesque Art Motif-Pieces from Ireland 2. A Discussion*, Stockholm, 1979, p. 100.

(55) Paul MULLARKEY, «Faint Steps: a note on the transmission of materials and techniques among goldsmith, illuminator and scribe», in *An Insular Odyssey Manuscript Culture in Early Christian Ireland and Beyond*, ed. Rachel Moss et al., Dublin, 2017, p. 128-137.

(56) Jean CUISENIER, *Un village au temps de Charlemagne*, Paris, 1988, p. 80.

Gospels of St Gall (Cod. Sang. 51 p. 267) in a depiction of the Last Judgment inside a decorative border. In the bottom corners of the frame, square panels display

a similar pattern, although less complex than that in the Book of Dimma (**Pl. 37**).

The more elaborate nature of the manuscript versions is to be expected, as the engraving or casting of a metal tool restricts the level of complexity possible. The third stamping tool is a single line circle with a solid circular «dot» in its centre. This stamp forms part of the geometric interlace pattern and is interspersed throughout the design. The interlace work is not produced from a stamp, but by a pallet-type tool with a double line face, or more simply perhaps by a scribing or creasing tool imparting a single line, repeated to create a double line pattern. Either system would require the use of a straight-edge and likely some form of mark-up. With so little surviving on the Armagh boards, it is difficult to be definitive.

Although interlace pattern work is ubiquitous in early medieval insular decoration and many examples for comparison are available, a close parallel with the same flat angular open-work may be seen on a ninth-century shrine. The Lough Erne house-shaped shrine was fished out of the lake after which it was named, 100 km west of Armagh, in 1891<sup>57</sup>. It consists of two shrines, one inside the other, the larger displaying a band of interlace soldered around the base of the «roof» with a very similar pattern to that on the Armagh boards and although this part of the shrine is a later, possibly 10<sup>th</sup>-century repair, the comparison is valid (**Pl. 38a**).

The division of book covers into rectangular panels is a well-attested ancient practice. A similar layout may be seen on the back board of the St Cuthbert Gospel, though the lines do not extend to the board extremities. The tool used to create the interlace on the Armagh boards was probably the same as that used to mark out the panels.

### ***The second binding event***

When Roger Powell began his examination of the Book of Armagh prior to its rebinding, he noted that the existing nineteenth-century binding had «the sides of an (original?) binding stuck down on the inside». As mentioned, he had decided to divide the manuscript into two volumes but also remounted the two leather sides inside his bindings, one in each volume (**Pl. 38b**). These remnants consisted of two pieces of vegetable tanned goatskin leather, dyed dark brown, with a series of perforations resulting from nails or studs being inserted to produce a pattern. The holes correspond with those found on the timber binding boards. Inside many of

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(57) Michael RYAN, «House Shaped Shrines», in *Art and Architecture of Ireland, Medieval c.400-c.1600*, ed. Rachel Moss, Dublin, 2014, p. 288. Ragnall Ó FLOINN, *Irish Shrines and Reliquaries of the Middle Ages*, Dublin, 1994, p. 24.

the holes on the boards are the shafts of the nails, but no nail heads have survived. This nail-work had introduced several substantial cracks in the oak boards. Small fragments of the brown leather also remain adhered to the boards.

The pattern on each board consisted of a double-cross, that is a saltire cross and an equal-armed cross inside a rectangular border. The decoration required 86 nails or studs for each pattern but the quality of workmanship is poor, with the straight-line forms wandering on much of the work and nail shafts that pierce through the boards and the vellum pastedowns. Close examination of the nail holes where they pierce the original alum tawed skin shows a «puckering» around the holes, suggesting that hollow, dome-headed nails were used, a type consistent with this form of decoration.

### ***Studded bindings***

Van Regemorter, commenting on the nail-hole pattern in 1961, stated that they resembled Armenian work and referenced a thirteenth-century binding she had recently seen in Venice<sup>58</sup>. The use of decorative studs on Armenian bindings is a common feature and no doubt the reason for the comparison. But the poor workmanship on the brown leather of the Armagh boards and the lack of additional integral decorative elements, such as blind tooling with stamps and line-work rules out such comparison. It appears instead more likely to be the work of a well-intentioned amateur, perhaps from an allied craft such as saddlery or upholstery.

Although the reuse of timber boards was not untypical when rebinding a medieval manuscript, the bookbinder always removed the remains of the earlier covering before reattaching the boards and forwarding<sup>59</sup>. In the case of the Book of Armagh, with the ragged remains of the first alum-tawed covering left in situ, the pliant nature of the vegetable-tanned leather adhered on top, would result in the profile of these fragments showing through, giving an uneven surface and inept appearance to the binding.

The question as to when this covering took place is difficult to answer. The evidence of Van Regemorter's observation is insufficient to assign it to the thirteenth century. William O'Sullivan linked the rebinding to John de Courcy who returned the book to the church of Armagh when the manuscript had been removed from the body of its hereditary keeper after the Battle of Downpatrick in 1178<sup>60</sup>. In my opinion, the time of Arthur Brownlow's reordering and numbering of the manuscript at the beginning of the eighteenth century, ought to be considered despite some evidence to the contrary [see text block]. It is difficult to establish any working technique that could be used to date the work, since the surviving leather

(58) Dublin, Trinity College, TCD MS 10525/1/25.

(59) This is the term used when the bookbinder takes the sewn text block and attaches boards and covering material.

(60) W. O'SULLIVAN, «Manuscripts and palaeography» (*supra* n. 1), p. 544.

from this event is no longer attached to the boards. However, that the degree of wear is significantly less than that on the earlier alum-tawed covering suggests a significantly shorter period in use for the studded binding.

There are practically no markings on the first and last folia from the one hundred and seventy odd nail tips that penetrated the boards. Examining the inner surface of the boards and the remains of the nail shafts, it is evident from the dimension of the hole and width of the shaft inside, that the nail tips have been clipped. However, during their original attachment, the points would have pierced the text block, unless a barrier of some description was placed between the two or the covering of the boards occurred before attaching the binding to the text block, similar to a modern-day case binding.

The question of why and when the studs were removed remains unanswered. Perhaps the heads of these studs were of a more precious metal than the shafts, maybe silver and their value caused their amputation? It is unlikely that the studs were pins that once held some decorative metalwork in place on the cover. There are far more than would be needed for such a purpose and the «puckering» mentioned above is not consistent with a separate piece of metalwork being attached. In addition, there is no evidence of such work visible on the tanned leather.

It is highly likely that the additional holes in the back edge of both timber boards and some frayed-out hemp stuck onto the inside of one board, along with a paper patch are associated with the studded covering. If this is so, then the crudeness of the board attachment methods would be consistent with the overall inexpert decoration techniques employed.

### ***Additional marks on the binding boards***

Careful examination of the boards of the Book of Armagh yields much that can be explained and chronologically ordered. One feature however, noticed shortly after their rediscovery in 1961 has so far defied explanation.

There is evidence of burning on the timber surface of both boards in the form of a number of square (c. 25 × 25 mm) and rectangular scorch marks. Most of these are not clearly defined but, in some instances a physical depression is created leaving a clear edge visible in the wood. This «branding» for want of a better term, must have occurred after the initial alum-tawed covering and before the studded leather work was added, as some of the tawed skin is scorched. There are possibly five such markings on the front board and a possible three on the right/back board. One, in the centre of the left/front board is particularly deep and gives a clear impression of a double field line border. All the marks appear randomly positioned with no obvious pattern to the layout (**Pl. 39a**). William O'Sullivan wondered if the markings were related to the attachment of jeweled decoration and Cains considered that the branding may have been the result of corrosion products, possibly from a book shrine, although I do recall he was far from convinced. When asked to comment by O'Sullivan, Roger Powell was of the

opinion that they were produced by heat and pressure and attempted to replicate the process: «We did some experiments with a heavy and hot tool to see if we could produce something similar. It made a nasty stink but did not produce anything at all convincing»<sup>61</sup>.

I believe that the branding is the result not of the transfer of corrosion products from a source, such as a decorated book shrine, but of the direct application of considerable heat and pressure. The random nature of the markings is reminiscent of what results from the use of a substrate for testing some unrelated operation and recalls the trial motifs on the cover of the Faddan More Psalter. It is possible that the branding took place at the time of the studded binding event, and the craftsman who undertook the rebinding employed such branding techniques in his usual trade; perhaps a saddle maker or blacksmith. The detached boards were available and provided a useful base to test a particular operation, in the knowledge that the marks will be covered with the brown goatskin once they are reattached to the manuscript. However, such techniques are not part of the bookbinder's craft and the markings, therefore, serve to strengthen the argument that the brown covering is the work of someone other than a bookbinder. The branding marks were never part of the decoration of the boards of the Book of Armagh.

### ***The Satchel***

The association of the Book of Armagh with the 15th century leather satchel is problematical, as its internal dimensions would require some effort to get the bulky manuscript inside its thick unyielding leather walls. At what period it became affiliated is unknown, but it would seem at least to go back to 1707 when Arthur Brownlow had possession of the manuscript. While in Bishop Reeves's possession, he mentions the problem of its direct connection in housing the manuscript, and it does confirm the two artefacts remained together at that time. The satchel is skilfully constructed from a single piece of thick cowhide, with the edges turned in, leaving no seam visible. The decoration harks back to the early medieval «Golden Age of Irish Art» with every surface of the thick cowhide covered in interlace, crosses and zoomorphic features<sup>62</sup>. The decoration method is *cuir-bouilli*, where saturated leather is worked over a form, and the patterns are shaped freehand using bone or wooden tools (**Pl. 39b**).

The satchel played a more direct role in its connection with the Book of Armagh when the original detached timber binding boards were placed inside. Remarkably, these were only discovered in 1961 when the satchel was being examined by the leather trade historian John Waterer. This is two years after Roger Powell had rebound the Book of Armagh and Powell would bemoan the fact that he was unaware of their existence and the lost opportunity to compare and record pre-

(61) Dublin, Trinity College, TCD MS 10525/1/387.

(62) B. MEEHAN, «Art of Worship and Devotion» (*supra* n. 1), p. 276.



vious sewing evidence in the back folds of the quires with the associated binding boards. The process becomes far more complicated and torturous once the manuscript has been bound.

***The two detached, soiled folios and the nail holes. An observation with a possible bearing on the chronology of the binding events***

While examining the folio surfaces to identify hair and flesh side, I noticed on f. 12 and f. 13 small perforations not related to any mark-up for writing. The holes were irregular, small and with rust-corrosion halos surrounding most. The holes were slightly more pronounced on f. 12 and easier to identify on the whiter surface of the recto (Pl. 40). When I overlaid the x-ray of the front oak board on to an image of folio 12, the holes on the folio matched a selection of the nail holes in the board. Since the holes on f. 12 align with those on f. 13, this indicates that these two folia had become detached from their respective quires at some period (damage to their back edges attests to this) and had been placed at the beginning of the nail-studded manuscript, without reference to their content. Alternatively, it is also possible that the detached folia had at some time been placed between the oak boards when these were housed inside the leather satchel.

The current collation places folio 12 as the last folio of the first quire, its conjoint folio being the lost folio 1. Folio 13 is placed as the first folio of the second quire, although there is no missing folio at the end of this quire, it is marked as a cancel with the presumption that folio 13 is a singleton (see appendix 3, p. 337).

Folios 12 and 13 are the most soiled in the manuscript and led Gwynn to suppose:

«When the book is opened between ff. 12 and 13, two pages facing one another (12v and 13r) are disclosed so rubbed and discoloured, no doubt by frequent contact of rough and unwashed hands, that large parts of the text they contain are almost (some of them altogether) undecipherable. Water stains also appear on the *verso* of f. 13, indicating a farther misuse of the volume. These leaves are the last (f. 12) of the first quire, and the first (f. 13) of the second quire, of the MS. At this place, accordingly, it would naturally open, and would probably be left open»<sup>63</sup>.

However, it can also be argued that if two detached folia, had been «floating» for a considerable period they are likely to be in such a dishevelled state.

If the studded binding follows Brownlow's work then folio 12 and 13 became detached again after this event and were placed at the beginning of the manuscript. Both folia were eventually reattached in their correct positions by Bigger during his binding in 1884.

There are no similar markings on any other folia in the first quire or the first folia of the other distinct parts of the manuscript. I also examined the last quires

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(63) J. GWYNN, *The Book of Armagh* (supra n. 9), p. cv.

of each of the three parts to see if the situation was repeated for the back board, but I found no signs of nail holes.

### **Conclusion**

The question as to how much and what part or parts of the current Book of Armagh were initially bound into the alum tawed covered oak boards, will remain difficult to establish.

Roger Powell, the only specialist who was in a position to examine the backfolds of the manuscript in detail, indicated to both O'Sullivan and Cains that he believed that the book had once been in three volumes. In correspondence with O'Sullivan, he added: «I cannot believe the carolingian binder would have bound the present collection of manuscripts in one volume between the boards he undoubtedly used; there were certainly later additions in subsequent bindings»<sup>64</sup>.

His opinion reinforces mine that both the oak boards were fashioned and the sewing technique chosen for a volume slimmer than the current tripartite manuscript; meaning that originally only one part was bound between them and this would probably have been the 73 folios of the four gospels (*Canóin*) or possibly the New Testament (158 folios).

This opinion concurs with Richard Sharpe's theory, which he based on the content and makeup of the manuscript, that the Book of Armagh was produced for library use; that it was a «desk-book rather than altar book» [and] «a normal production of the scriptorium»<sup>65</sup>.

The evidence of tacketing of the quires would further support this position and add weight to the separation of the four gospels for binding between the oak boards in a structure that represented the contemporary book-making practice. This study of the boards presents clear evidence that there was an awareness of carolingian binding techniques in Ireland at the time and the competence to add refining features.

A close examination of the text block of the manuscript showed strikingly few traces of intrusive episodes occurring over a millennium. Significantly, there are no telltale signs of the manuscript having spent a period enclosed in a book shrine. Damage is always discernible whenever books were so treated, the *Cathach* or *Usserianus Primus* being extreme examples. But even when shrine conditions were less hostile, as with the Book of Dimma or the Book of Mulling, damage to these manuscripts due to enshrinement is evident.

Likewise, the signs of heavy use on the original carolingian binding over an extensive period suggest to me that the Book of Armagh was never enshrined in a casket and therefore what was commissioned by the high king Donnchadh was in the nature of a fine binding, which would have looked resplendent in its tooled

(64) Dublin, Trinity College, TCD MS 10525/1/287.

(65) R. SHARPE, «Palaeographical Considerations...» (*supra* n. 4), p. 8-12.

red cover. In this regard, I believe there is a possibility, based on the scrutiny of somewhat vague seventeenth-century observations, that the Book of Durrow was similarly bound and decorated rather than encased in a shrine by Donnchadh's father, Flann<sup>66</sup>.

Despite the natural tendency to try and link particular historical events with the evidence presented by careful physical examination of an artefact such as the Book of Armagh, there will be extensive periods of time when that object will have dropped out of history. So, notwithstanding its remarkable state of preservation and over 1000 years of documented history, certain events in the manuscript's life will remain unknown, events that would surely clarify some of the codicological features we observe today.

John GILLIS  
Trinity College, Dublin

#### RÉSUMÉ

Le Livre d'Armagh (Dublin, Trinity College, TCD MS 52) est un manuscrit composite sur parchemin du début du IX<sup>e</sup> siècle (période dite «insulaire»). Ce manuscrit contient une copie complète du Nouveau Testament, ainsi que des documents relatifs à s. Patrick et s. Martin de Tours. Il a été attribué au copiste et artiste Ferdomnach, dont le nom apparaît sur ses pages. Une inscription indique que le manuscrit a été produit pour Torbach, abbé d'Armagh en 807. Le colophon permet une datation précise de production, ce qui est peu habituel. Deux éléments supplémentaires ont été historiquement associés au Livre d'Armagh; une sacoche en cuir du XV<sup>e</sup> siècle richement décorée et une paire d'ais de reliure en chêne, considérées comme les ais originaux du manuscrit. L'examen approfondi de ces ais a fait l'objet de deux études, à plus de vingt ans d'intervalle, dont aucune n'a été publiée dans le détail. Cet article vise à remédier au manque de données codicologiques relatives aux ais et à examiner les scénarios possibles quant à leur fonction originale et leur association au Livre d'Armagh.

#### Appendix 1. A comparison between singletons and pastedowns

The intention of this exercise is to establish if any of the extant singletons throughout the text block in the manuscript might have been originally conjoint with one of the two pastedowns attached to the wooden boards. If such a connection could be definitively established, it would give critical evidence as to the original make-up of the manuscript in its first guise.

Examining other single folia in the manuscript that could qualify as the previously conjoint leaves with one of the two pastedowns follows. This could assist in indicating the original content of the manuscript placed between the oak boards.

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(66) STERLING DE COURCY WILLIAMS, «The Termon of Durrow», *The Journal of the Royal Society of Antiquaries of Ireland*, Fifth Series, Vol. 9, No. 1, Dublin, 1889, p. 46. William O'SULLIVAN, «The Donor of the Book of Kells», *Irish Historical Studies*, Vol. 11, No. 41, Cambridge, 1958, p. 6-7.

There is a requirement to match the hair/flesh orientation and if possible follice patterns and scrape marks.

F. 12 This is the final folio of the first quire and most probably the conjoint of the now lost folio 1.

F. 13 qualifies as a conjoint folio for both the front and back pastedown, although unlikely to be either and more likely a singleton.

F. 20 is the first folio of Ferdomnach's *Supplementum*, a quire of five folia, with the presumption that the sixth folio was a cancel. This folio could be the conjoint with the back board pastedown and would place the first three quires, including the Composite Life of Patrick into the oak board binding.

F. 31 is the final folio of the fourth quire. This would make an ideal candidate for the conjoint folio of the front pastedown and as the first quire of the gospels. It would place this part of the manuscript, consisting of eleven quires, between the oak boards, however, the hair/flesh orientation does not match.

F. 134 (133, erroneous foliation) is the first folio of the nineteenth quire, a quinion and part of the Pauline Epistles. Its position and hair/flesh orientation qualifies it as possibly a conjoint folio for both the front and back pastedown. The quire however, is the penultimate of scribe B's work and as such unlikely as a first or last quire.

F. 171 (170, erroneous foliation) the final folio of the twenty-second quire. It displays a series of interlace filled rectangles representing Jerusalem with its twelve gates, each bearing the name of its precious stone, its tribe, and its apostle. This is scribe A's work on Apocalypse and Acts of the Apostles. The hair/flesh orientation would not allow for this folio to be conjoint with the back pastedown.

F. 221 (220, erroneous foliation) the final folio in the manuscript, qualifies for the «fly-leaf» scenario. It is considered to be an additional singleton added to the last quire, a quaternion of eight leaves. If, instead of attaching to this quire, it was actually a «stand-alone» bifolio, then it could have been the conjoint of the back board pastedown, perhaps placing the Epistles and the text of St Martin of Tours into the oak boarded binding.

There are no other candidates for conjoint folia with the pastedowns throughout the manuscript, however, this does not preclude other parts of the Book of Armagh, such as the Gospels from being the single component bound in the first instance between the oak boards and alum tawed covering. It is possible that the pastedowns were either singletons or more likely, bifolia, not part of the adjacent quire but forming flyleaves (now lost) at front and back of the manuscript. Both conventions are recorded as a feature of carolingian binding.

## Appendix 2. Material and documentary evidence and the early chronology of the Book of Armagh

Combining what is reliably recorded about the manuscript put together with the physical and structural features of the associated wooden boards, it is possible to suggest some scenarios as to when and which part or parts of the manuscript were bound into the red stained alum tawed binding. The following scenarios are possible:

**9th century** – the manuscript is planned, 3 parts are envisaged:

1. A Gospel Book by Ferdomnach, the principal scribe, the «*scriba optimus*» (died 846).
2. The rest of the New Testament is added by Scribe A, helped by Scribe B.
3. Scribe A copies contemporary Patrician material that includes Martiniana, helped by Ferdomnach.

The composite manuscript is formed of unbound tacketed quires and is kept inside a folder/portfolio or satchel. In Armagh, later in the ninth century, part of the composite manuscript was bound in timber boards and covered in pink stained alum tawed goatskin. This would most probably have been part 2, the Gospel Book, and may have included the Epistles and Acts of the Apostles, but not the entire manuscript. I offer this opinion, based on structural evidence, particularly as the weight of the boards and the use of only two sewing supports would not provide a stable binding for the 221 folios of the Book of Armagh as it is today.

**937CE** – In this year, the *Annals of the Four Masters* record that:

«Canoin-Pháttraicc do chumhdach lá Donnchadh, mac Floinn, rí Ereann».  
Canoin-Phadraig was covered by Donnchadh, son of Flann, King of Ireland<sup>67</sup>.

Possibly it was in this year that part of the manuscript was bound for the first time in a decorative Carolingian binding on the instructions of Donnchadh, King of Ireland and not enclosed in a shrine. The verb used by the annalist and translated as enshrining may also be rendered as covering<sup>68</sup>. *Canóin* in Old Irish refers to the four gospels and points to the likelihood that only that that part of the collection (supposedly written by Patrick himself) was honoured by the king. I note Richard Sharpe's observation of a certain lack of supporting evidence for *Canóin Phátraic* referring to the Book of Armagh in the first instance<sup>69</sup>.

(67) John O'DONOVAN (ed.) *Annals of the Kingdom of Ireland by the Four Masters* (*supra* n. 6), p. 639.

(68) *Canóin Phátraic do chumhdach lá Donnchadh mac Floinn, rí Éreann* which John O'Donovan translates as «Canoin-Phadraig, was covered by Donnchadh, son of Flann, King of Ireland».

(69) R. SHARPE, «Palaeographical Considerations...» (*supra* n. 4), p. 27.

**c. 1005CE** – An entry was made on folio 16v recording an agreement between *imperator Scotorum*, Brian Bóruma and the Church of Armagh, penned by his amanuensis, Mael Suthain<sup>70</sup>.

The majority of book shrines were constructed in a way that did not allow access to their contents without dismantling adding weight to the argument that the Book of Armagh was not enshrined<sup>71</sup>. It is possible that the event occurs with the Patrician Texts bound in the ninth-century carolingian binding: folio 16v was convenient to use as there was a blank space on the skin. However, I favour the scenario where the Patriciana section of the manuscript remained unbound at the time, especially as it was a centrefold, and easily removed. This would also explain a degree of soiling on this part of the book, most regularly accessed due to its content, which was most important in supporting Armagh's claims for primacy in the Irish church.

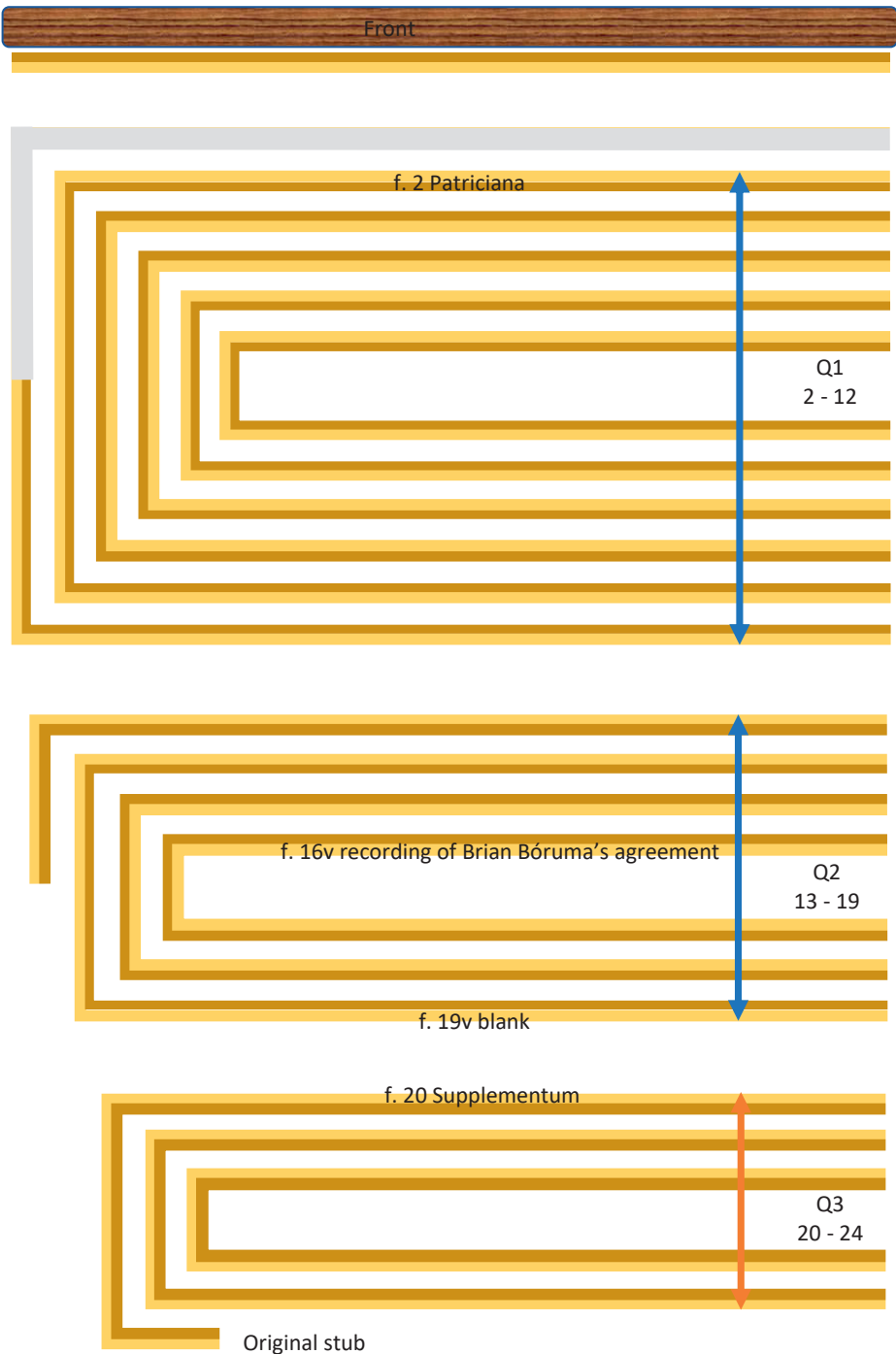
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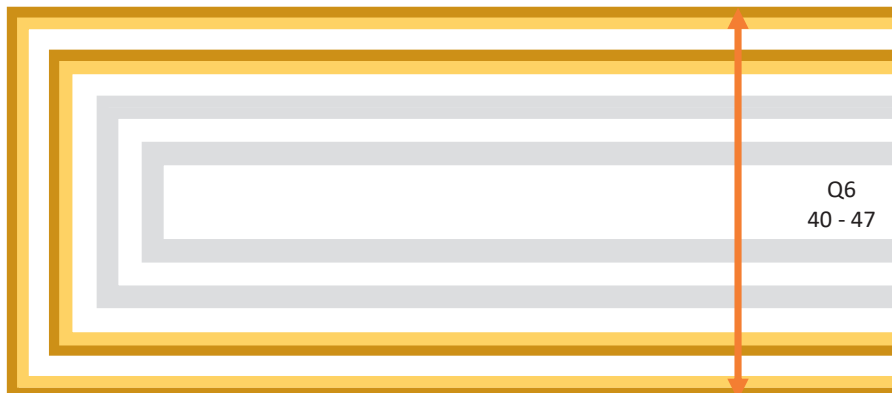
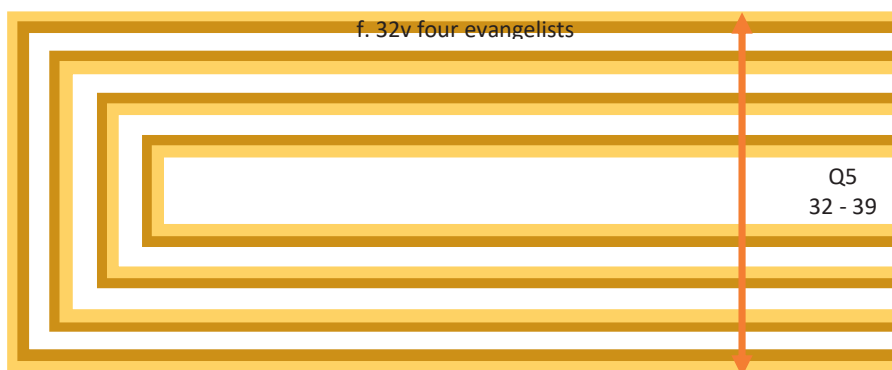
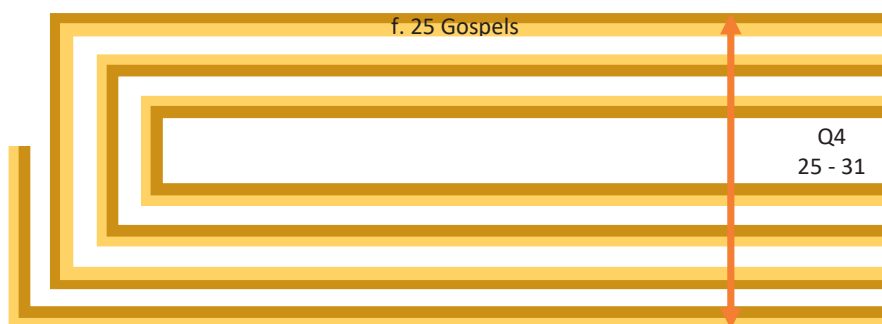
(70) *Annals of Ulster*, Vol. 1. A.D. 431-1056, transl. William HENNESSY, Dublin, 1887, p. 514

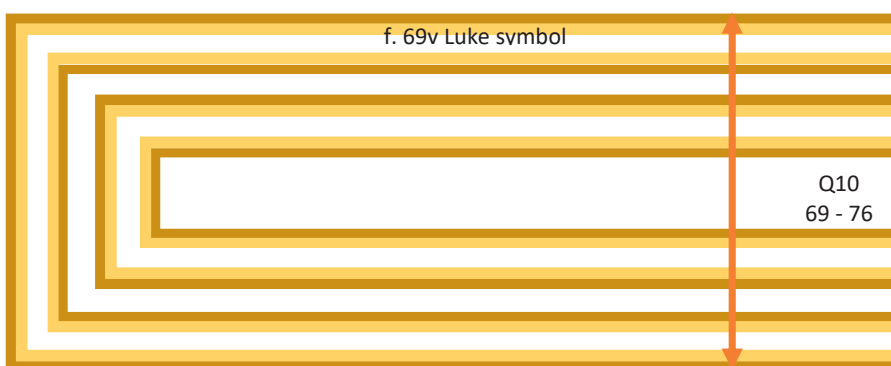
(71) Paul MULLARKEY, *The Sealed Word? Book-Boxes and Book Shrines: The Irish Dimension*, in-press.

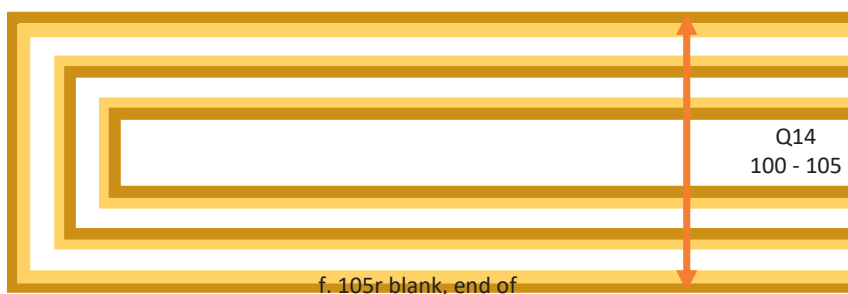
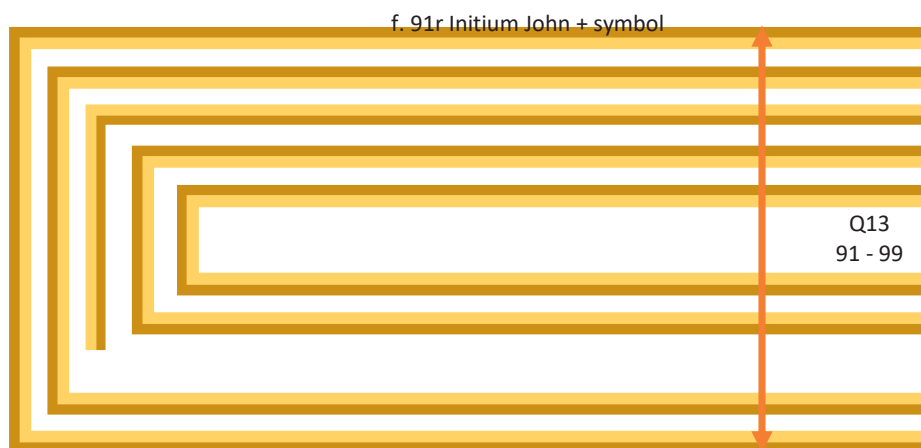


Appendix 3. Collation Map

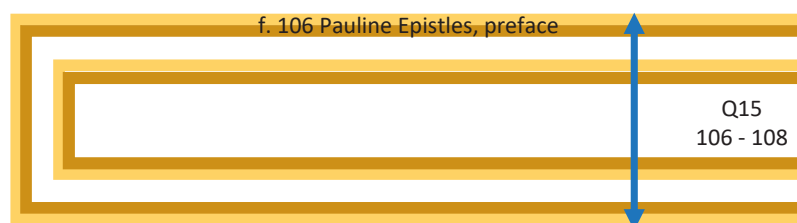




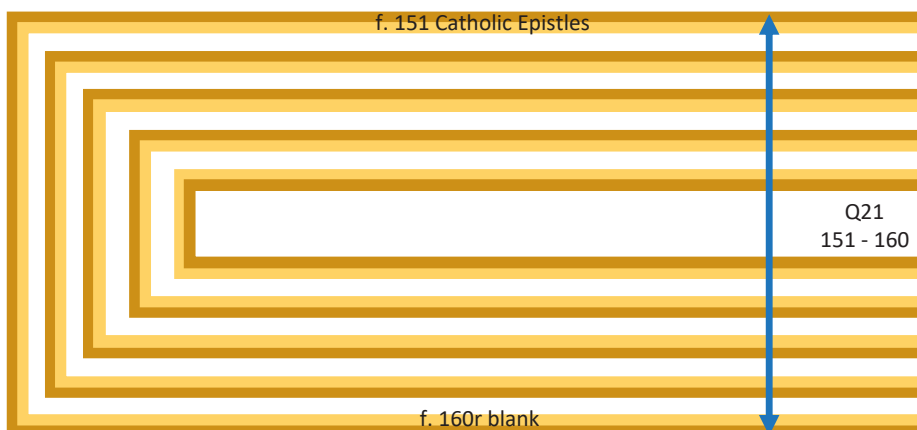
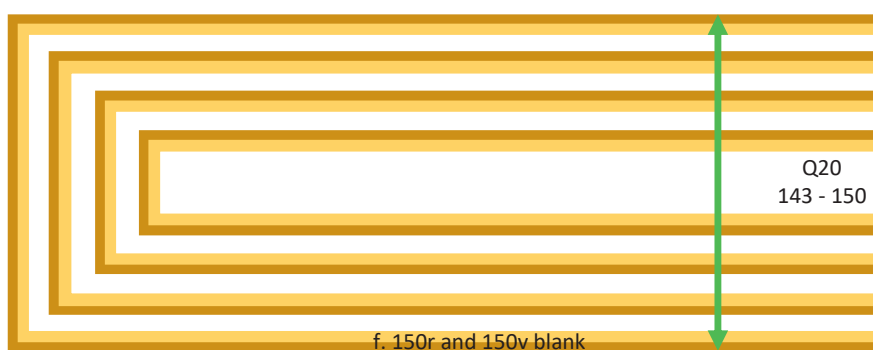




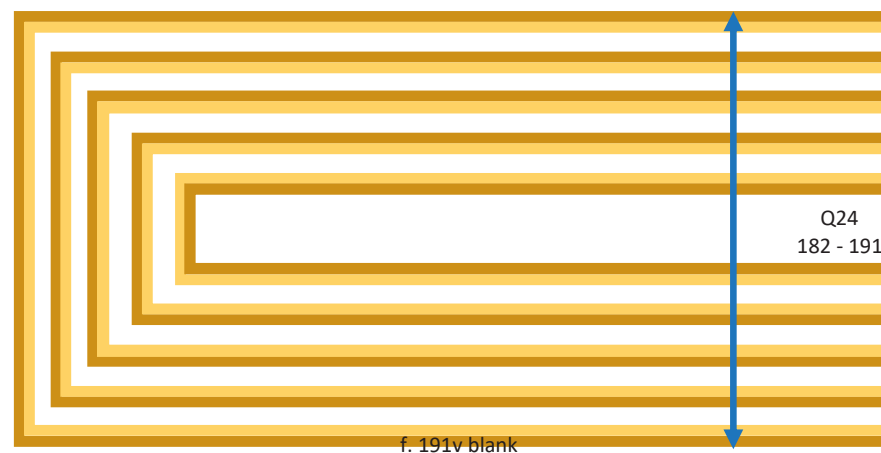
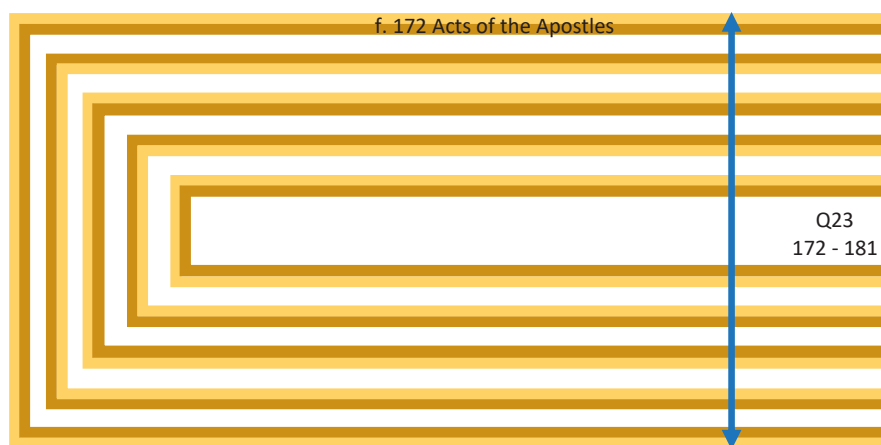
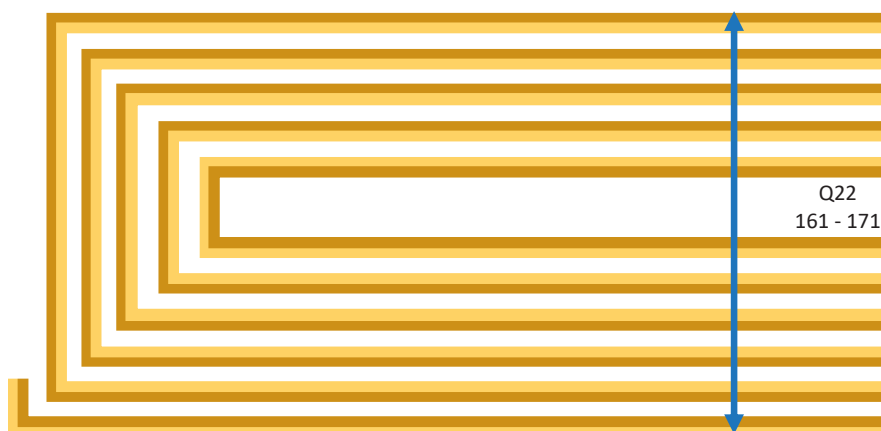
Second Powell binding starts here

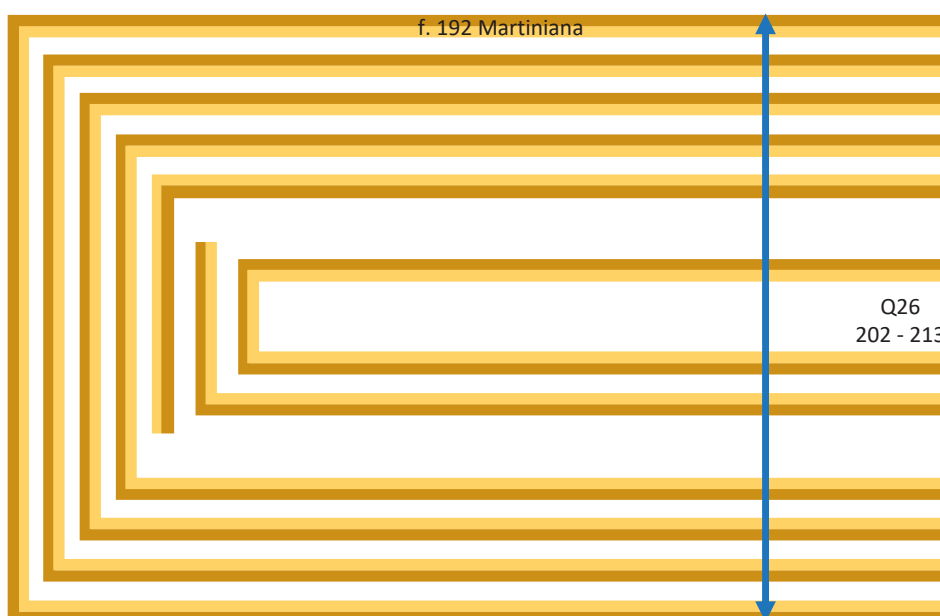


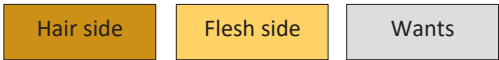
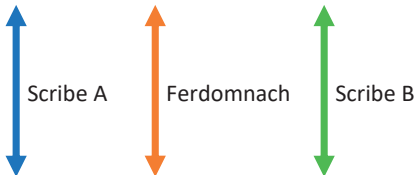














## PLANCHES

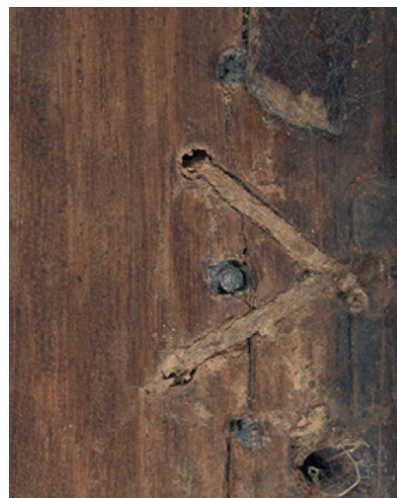
John GILLIS, *The Book of Armagh: A Codicological Reassessment*



a)



b)



c)

- Pl. 32** – a) Trinity College Dublin, TCD MS 52, the outer face of the binding boards  
– b) Trinity College Dublin, TCD MS 10525/1/130, The two volumes of the Book of Armagh in Roger Powell's workshop (the manuscript on top is the Book of Dimma)  
– c) Trinity College Dublin, TCD MS 52, detail of carolingian lacing into the oak board  
(©The Board of Trinity College Dublin)

PLANCHIES

John GILLIS, The Book of Armagh : A Codicological Reassessment



a)



b)

- Pl. 33** – a) St Gallen, Stiftsbibliothek, Cod. Sang. 904, exposed inside of back board with original carolingian lacing ([www.e-codices.ch](http://www.e-codices.ch))  
– b) Trinity College Dublin, TCD MS 52, inner surface of the oak boards showing the red stained skin (©The Board of Trinity College Dublin)



## PLANCHES

John GILLIS, *The Book of Armagh: A Codicological Reassessment*



a)



b)



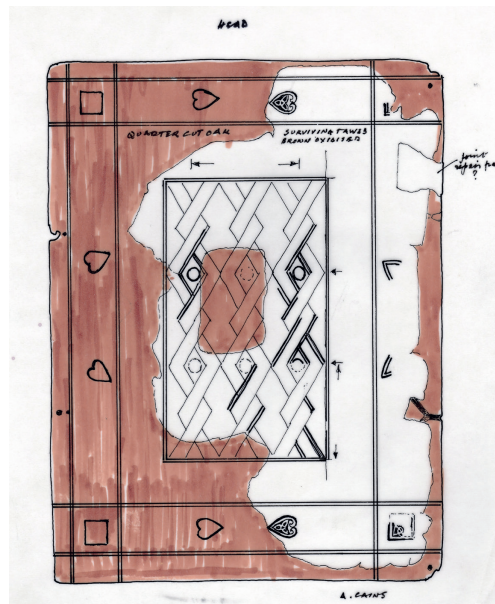
c)

- Pl. 34** – a) Trinity College Dublin, TCD MS 52, x-ray of front board  
(©The Board of Trinity College Dublin)  
– b) Trinity College Dublin, TCD MS 52, x-ray of back board  
(©The Board of Trinity College Dublin)  
– c) National Museum of Ireland, Possible cover fragment with tooling  
(©National Museum of Ireland)

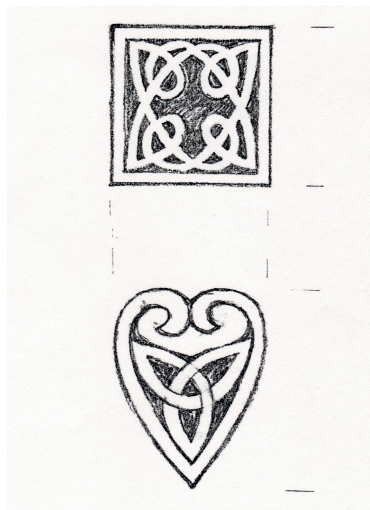


# PLANCHES

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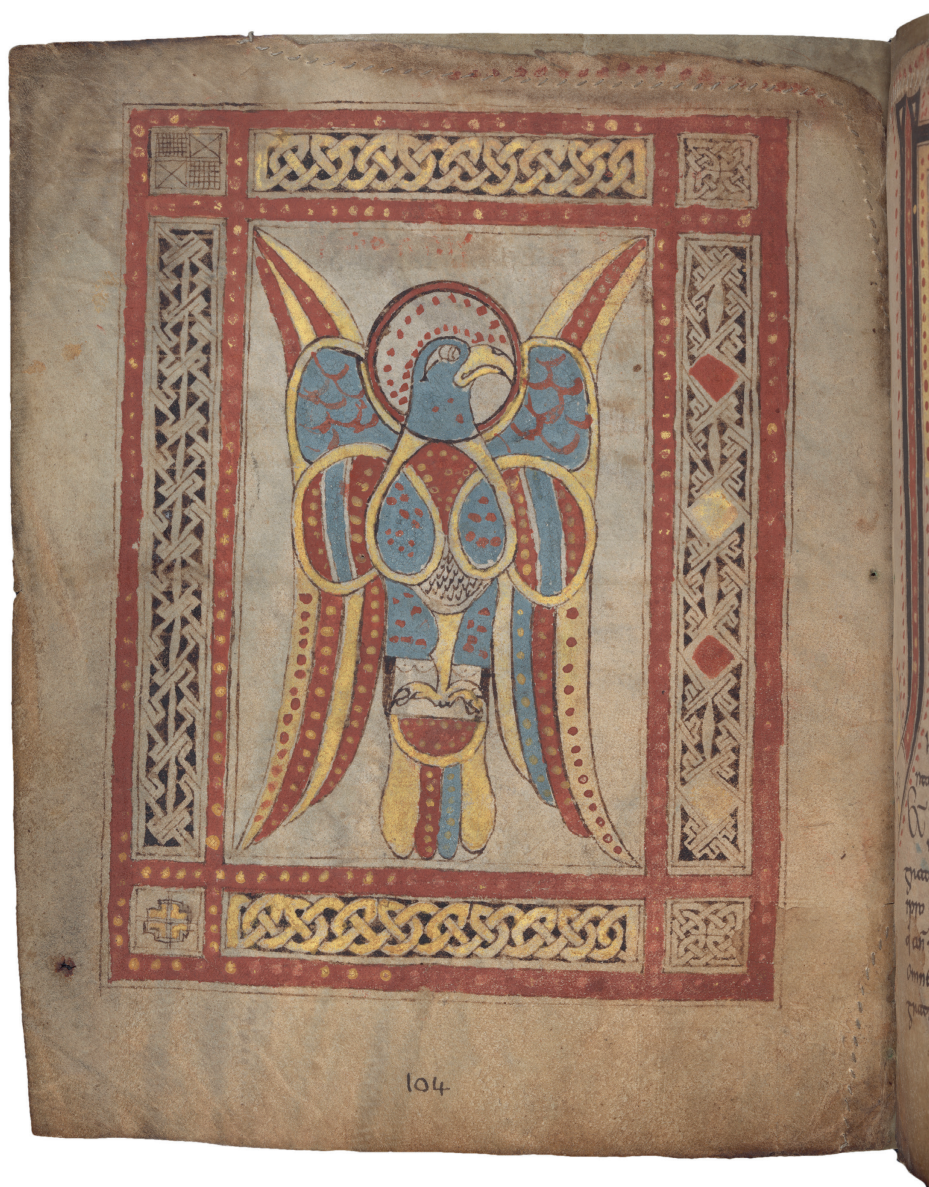
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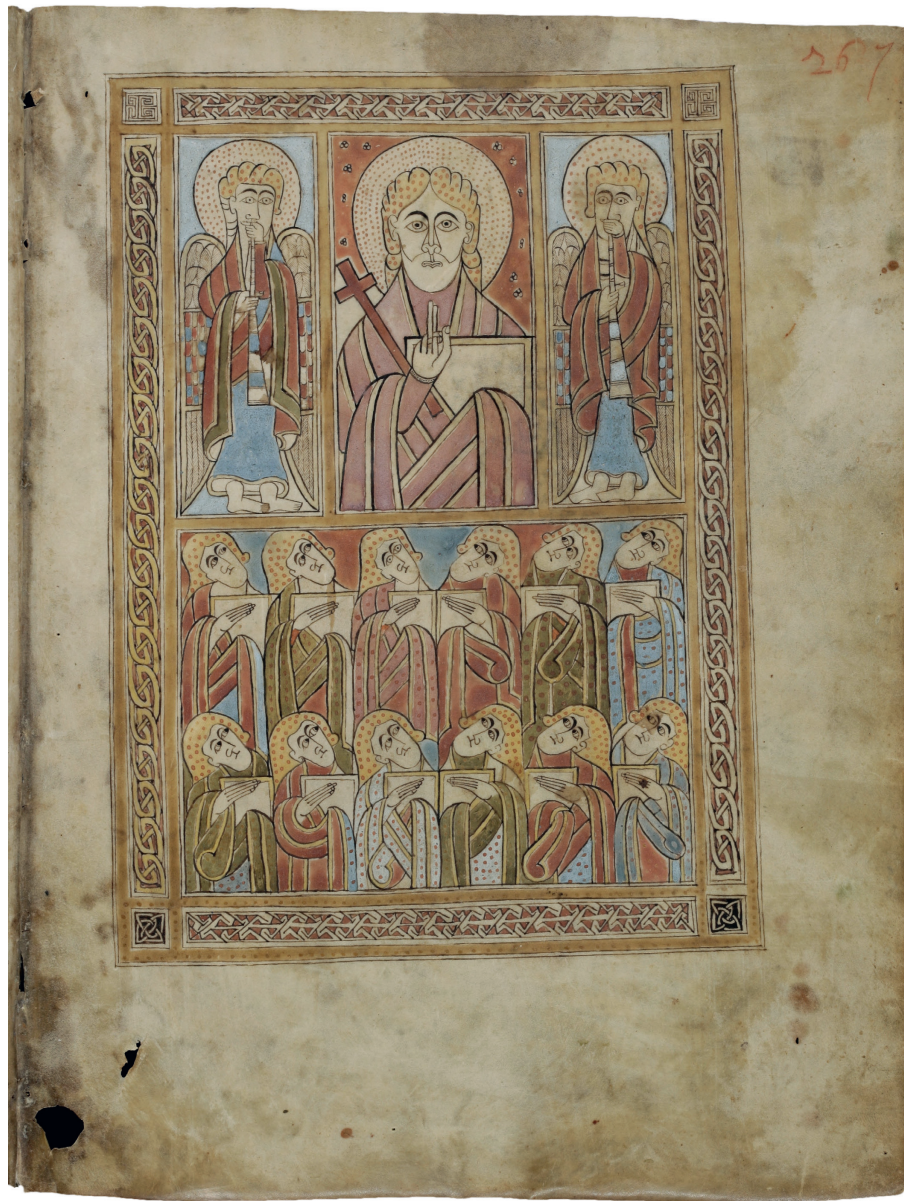
**Pl. 35** – a) J. GILLIS, Graphic reconstruction of first binding by A. Cains  
– b) J. GILLIS, Illustration of two stamp designs from the cover by A. Cains

John GILLIS, *The Book of Armagh: A Codicological Reassessment*



**P1. 36** – Trinity College Dublin, TCD MS 59, p. 104. Book of Dimma, symbol of John  
(©The Board of Trinity College Dublin)

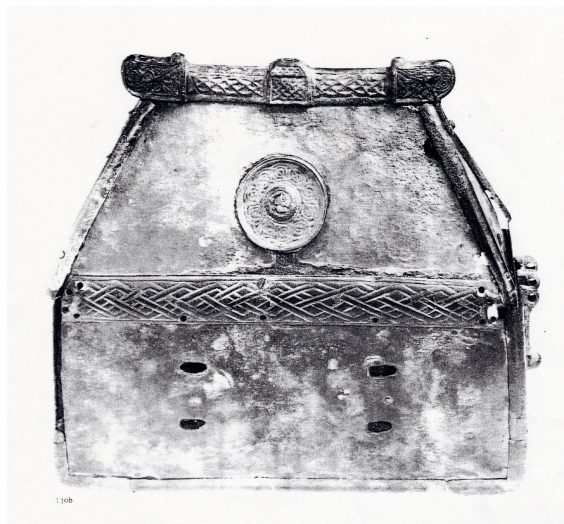




**Pl. 37** – St Gallen, Stiftsbibliothek, Cod. Sang. 51, p. 267.  
A depiction of the Last Judgment  
([www.e-codices.ch](http://www.e-codices.ch))

PLANCHES

John GILLIS, *The Book of Armagh: A Codicological Reassessment*



a)



b)

- Pl. 38** – a) National Museum of Ireland, Lough Erne shrine  
(©National Library of Ireland)  
– b) Trinity College Dublin, TCD MS 52, mounted tanned leather board panel  
(©The Board of Trinity College Dublin)



PLANCHES

John GILLIS, *The Book of Armagh : A Codicological Reassessment*



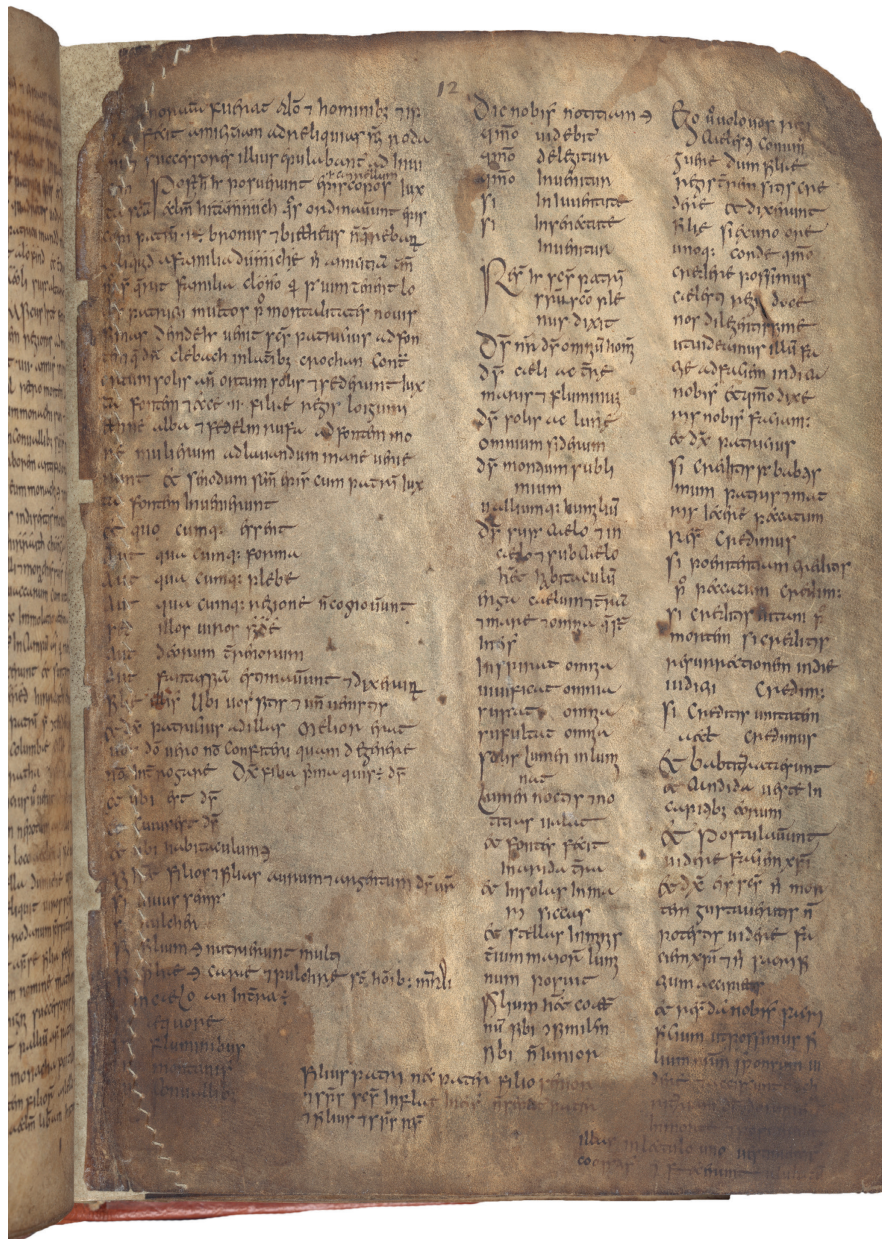
a)



b)

- Pl. 39** – a) Trinity College Dublin, TCD MS 52, branding impressions on front/left board  
(©The Board of Trinity College Dublin)  
– b) Trinity College Dublin, TCD MS 52, 15<sup>th</sup> century leather satchel  
(©The Board of Trinity College Dublin)

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Pl. 40 – Trinity College Dublin, TCD MS 52, folio displaying puncture holes from nails, f. 12r  
(©The Board of Trinity College Dublin)