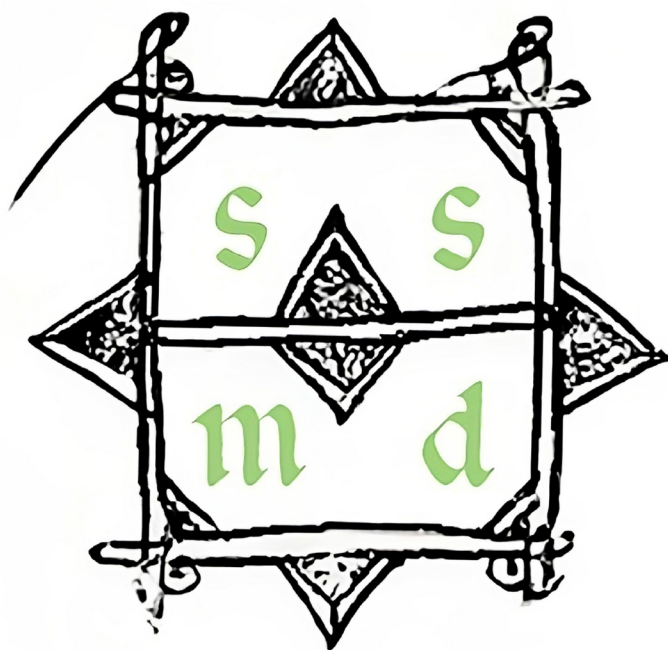


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**Learning by Re-searching. The experience
of the INTRADAMS Summer School at the Crossroads
of Skill Acquisition and Knowledge Production**

di Ludovica Invernizzi

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Learning by Re-searching. The experience of the INTRADAMS Summer School at the Crossroads of Skill Acquisition and Knowledge Production

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From the very beginning, the INTRADAMS (INtegrating TRaditional and Digital Approaches in Manuscript Studies) Summer School organized by the University of Milan has had a clear set of objectives: not only to offer Italian and international students and researchers the opportunity to become familiar with the most recent technologies in the study of palimpsest materials – specifically Multispectral Imaging (MSI) technologies –, but also to foster cooperation among individuals with different yet complementary areas of expertise and educational backgrounds¹. Quoting the call of the school itself, the course aims at promoting:

¹ To learn more about Multispectral Imaging technologies and their possible applications on palimpsest manuscripts see BEARMAN - BOORAS - CHABIERES, *Imaging the past*; DAVIES - ZAWACKI, *Making Light Work*; and ZAWACKI, *Fragments under the Lens*. Among the many initiatives operating with MSI techniques for the study of palimpsest material, here we will just recall the *Lazarus Project* that coordinates different sub-initiatives aimed at recovering different palimpsest materials such as manuscripts, maps and paintings, currently hiding in the collections of several institutions across the world; see more at <https://lazarusprojectimaging.com/projects/>. As concerns projects active in Italy, the partnership with the Library and Archive of the Chapter of Vercelli has brought to some significant results on artifacts like a 13th century world map, see DAVIES, *Multispectral Imaging of the Vercelli Mappa Mundi*; EAD., *Heavenward Gaze, Earthly Ambitions*; and on the renowned Vercelli Book, see HEYWORTH, *New Light on the Vercelli Book*. Furthermore, multispectral imaging analyses are still processing and recovering important documentary palimpsests from another manuscript of the Vercelli Chapter, the ms. CLXXI, see VIGNODELLI, *Scarto e reimpiego all'Archivio Capitolare di Vercelli*.

«the deepening of historical, textual, graphic, and material knowledge of books and documents through the interaction of the traditional approaches (i.e. historical, paleographical, codicological, and philological-textual exegesis) with those of digital diagnostics, applied physics, imaging, and materials science»².

A practical approach, therefore, centered on the learners themselves, who — by applying what they have learned during the theoretical phase — have the opportunity to experiment with new and sophisticated technologies, which they would otherwise rarely have the chance to encounter. Most importantly, they can combine their own knowledge with that of their peers. In this learning journey, students are not only at the center of the theoretical acquisition of knowledge regarding both the subjects of study and the technologies employed, but they are also active participants in every phase of the work: from the multispectral image acquisition to image processing, and finally to the reading and the interpretation of the results. Hence, the course aligns perfectly with the most recent didactic trends for which «the learning goal should be that students be enabled to create new knowledge»³.

Within this operational framework, the work of the previous editions of the Intradams Summer School took place. In particular, during the first two editions (June 26 - July 7, 2023 and 3 - 14 June 2024) the classes focused on the analysis of manuscript Triv. 1084 from the Biblioteca Trivulziana di Milano⁴, a 15th century codex containing a copy of Dante's *Commedia*, largely composed of palimpsest materials, which served as a perfect case study for testing the use of MSI (MultiSpectral Imaging) technologies and, at the same time, for bringing to light documentary and other kinds of materials that had previously been unknown to scholars. Then, the third edition (9 - 20 June 2025) was the occasion to bring the attention to other two manuscripts, preserved at the Archivio e Biblioteca del Capitolo Metropolitano di Milano. The main focus was the *Liber Primicerii*, a codex compiled by some clerics of the Milan Cathedral in the first half of the 15th century carrying different texts related to the church and, specifically, to its *Primicerius*⁵. This manuscript also represents a particularly interesting case, as it contains many documentary palimpsests that had not yet been detected or investigated

² As it is stated on the site of the call for the INTRADAMS Summer School, <https://studistorici.unimi.it/it/didattica/progetti-e-laboratori/summer-school-intradams>.

³ MOLINARI, *Handwritten culture*, p. 98.

⁴ ASCBT, Triv. 1084. The codicological sheet of this manuscript is available on the Manus Online catalogue at the url: <https://manus.iccu.sbn.it/cnmd/0000050146>. On the library and its collections, here follows the institutional site at <https://www.milanocastello.it/archivi-e-biblioteche/archivio-storico-civico-e-biblioteca-trivulziana>; see also SANTORO, *I tesori della Trivulziana*; EAD., *I codici medievali*; PONTONE, *I manoscritti datati*.

⁵ The title used to identify the clergyman who had to oversee over minor clerics of the church. On the role of the *Primicerius* and the differences between *Primicerio maggiore* and *Primicerio minore* see COMPAGNONI, *Primicerio maggiore*, pp. 415-419; ID., *Primicerio minore*, pp. 419-422.

by historians⁶. The secondary sample was the *Fragmentum Calendarii Ambrosiani*, the remaining fragment – consisting in a single quire, a quaternion – of an 11th century codex containing one of the oldest exemplar of the Ambrosian calendar, along with many other entries added over time. In this case, MSI technologies were applied to test whether it was possible to recover what had been damaged due to the chemical reagents used by earlier erudites⁷.

These were the items that the students tried their hand at over the duration of the courses. Under the guidance of the teaching staff⁸, each student had the opportunity to directly access and experiment with the sophisticated system used to capture images of the manuscripts under different light spectra, observing – and indeed experiencing – first-hand the procedures and the potential challenges that can affect the proper acquisition of images. Further, the resulting images became the subject of analysis for the students, who took charge of the processing phase by working with the HOKU software⁹.

Alongside this experimentation, and indeed as a fundamental follow-up of these operations, the participants also managed to integrate a ‘traditional’ approach, investigating what was progressively surfacing again thanks to the work on the multispectral images. The study of reused materials within manuscript books in itself requires mastery of several disciplines, such as codicology, philology, diplomatics, and paleography. In this respect the three case studies were no exception: on the contrary, they turned out to be complex objects and ended up posing more than a few surprises for the scholars engaged in their analysis. During the first edition of INTRADAMS, the processing of an initial set of folios had already made it possible to gain a preliminary glimpse of the heterogeneity characterizing the reused material employed within the Dantesque manuscript. In fact, from the very first sampling, the manuscript’s pages revealed the presence of a variety of materials in terms of content and, likely, also in origin. Specifically, this first round of study unveiled the presence of some chancery-notarial documents produced in southern Italy, dating to around the 13th–14th century¹⁰; documentary material written in a ‘curialesque’ script – that is, material still attributable to a chancery ambience, though difficult to pinpoint precisely in terms of

⁶ BCMM, Manoscritti, II-E-02-006 (*Liber Primicerii*). For the codicological sheet see <https://manus.iccu.sbn.it/cnmd/0000274260>.

⁷ BCMM, Manoscritti, II-E-02-016 (*Fragmentum Calendarii Ambrosiani*). For the codicological sheet see <https://manus.iccu.sbn.it/cnmd/0000274331>. On the history and the manuscript heritage of the library see RUGGERI, *Documenti per la storia della Biblioteca*; and *Codici, persone, libri e documenti*. For the institute’s web page see at <https://www.duomomilano.it/vita-liturgica/capitolo-metropolitano/biblioteca-capitolare/>.

⁸ An overview of the teachers and lecturers that take part in INTRADAMS is available at this web-page: <https://studistorici.unimi.it/it/didattica/progetti-e-laboratori/summer-school-intradams>.

⁹ More information on the Hoku software at <https://www.cis.rit.edu/~ktpci/Hoku.html>.

¹⁰ ASCBT, Triv. 1084, ff. 54v, 78v.

both the legal nature of the text and its geographical and chronological context¹¹; and, lastly, a folio containing material of literary origin¹².

The operations carried out during the second edition of the school, and then continued by some *alumni* after the end of the course, made it possible to further expand the pool of processed folios, bringing additional documentation to light and further unfolding the great complexity of the materials used in the manuscript's composition. First of all, additional folios containing documents from the southern Italian area were identified and made accessible again, albeit with varying degrees of legibility depending on the reuse process. Confirming what had already been noted in some preliminary analyses of the manuscript, the processing of the multispectral images revealed the presence of folios subjected to various methods of erasing previous writing: in some cases, the text had merely been washed off, while in others it had been further scraped away, making it more difficult — or at times impossible — to read.

Without going into too much details, no fewer than 60 documents have been calculated to be within the pages of the Triv. 1084¹³, most of which clearly traced to the area of the Kingdom of Naples during the Angevin rule, as indicated by references to King Robert of Anjou (1309-1343) and Queen Johanna I of Anjou (1344-1352)¹⁴. This is certainly a significant discovery, especially in light of the severe loss suffered by the Neapolitan documentation over the centuries and particularly during the events of the Second World War¹⁵. Also, more folios bearing the 'curialesque' type of writing have been found and have been eventually linked to their possible production setting, again corresponding to late medieval (13th-14th

¹¹ Ivi, ff. 23v, 28v, 84v.

¹² Ivi, f. 90v.

¹³ Ivi, ff. 38r, 69r, 71r, 72v, 73r, 75r, 78v, 79r, 93r, 106v, 107r, 110v, 111r, 117r, 119r, 123r, 125r, 126v, 130v, 144v, 145r, 148v, 150v, 165r, 168v, 184v, 194v, 195r, 196v, 197r, 199r, 207r, 208v, 209r, 212v, 216v, 220v, 226v, 231r, 239r, 241r, 244v, 245r. As regards those documents identified on both parts of a bifolio see ff. 51r-54v, 58v-63r, 59r-62v, 60v-61r, 84v-85r, 91r-94v, 115r-118v, 162v-167r, 169r-176v, 180v-181r, 188v-189r, 193r-200v, 210v-215r, 211r-214v, 217r-224v, 218v-223r, 219r-222v, 225r-232v, 227r-230v, 228v-229r, 233r-240v, 235r-238v, 236v-237r, 242r-247v, 243r-246v; this means a total of 43 folios and 25 bifolia.

¹⁴ For an introduction on the Angevin domination on Naples see Musi, *Il Regno di Napoli*, especially the second chapter Angoini e Argonesi, pp. 63-72; also see *Storia di Napoli. Volume III*, pp. 1-333. Specifically, regarding King Robert, Queen Johanna and the surviving documentation from their period see CONIGLIO, *Angiò, Roberto*; KIESEWETTER, *Giovanna I d'Angiò*; RUOCO, *Documenti dei Registri Angioini*; a recent contribution is in ESPOSITO, *I documenti delle arche in carta bambagina*.

¹⁵ To give some context, the State Archive of Naples was significantly impacted by many accidents occurred in the years of the Second World conflict, loosing many archival series in the process. Probably the most destructive incident was the fire that broke out in September 1943 in the Villa Montesano at San Paolo Belsito where a great deal of the Archive had been previously transferred for safety reason. See DAMIANI - FELICIATI, *I Farnese tra Roma, Parma e Napoli*, pp. 156-161. Particularly on the events at Villa Montesano see also TARALLO, *Tra distruzione, dispersione e speranza*.

century) southern Italy¹⁶. Beyond these findings, students have discovered the presence of further reused book materials, originating from two different sources. The first is a manuscript of legal content written in French, detected on at least three folios, including the one already recovered in 2023 during the first Summer School (ff. 81r, 89r, 90v). The second, found on four folios (ff. 20v, 21r-v, 27r-v, 30r-v), corresponds with a Latin text recognized as a witness of Terence's *Andria*¹⁷.

The activity of the third edition turned out to be equally fruitful. In fact, although the *Liber Primicerii* has fewer palimpsests than the previously studied manuscript, this indeed allowed researchers to acquire nearly all the images needed – 26 folios¹⁸ – within the time available and concurrently to proceed with the first processing attempts. The initial results confirm the preliminary observations made with the aid of the Wood lamp at the beginning of the manuscript's analysis: in this case, all the reused materials share both the same nature and the same context of production, as they are all documentary records concerning the episcopal church of Milan. Specifically, the identified documents mainly consist of asset transactions and judgements from the bishop's court, dated between the second half of the 13th century and the late 14th century¹⁹. The perspective of recovering such documentation presents an important opportunity to deepen our understanding of the documentary-related practices within the environment of the Milanese church not only regarding the production of its records, but especially in relation to the procedures and the criteria applied in discarding and repurposing them.

In addition, the 2025 class also dedicated its efforts to the *Fragmentum Calendarii Ambrosiani*, which was entirely photographed using the MSI system. As mentioned above, the challenge here was to recover the parts of the manuscripts that had been compromised by chemical reagents – such as the Gioberti tincture, recognizable by its distinctive bluish traces – commonly employed in the 19th century as scholars started to study this peculiar kind of material²⁰. In the Ambrosian calendar, as in other chemically treated manuscripts, these substances were

¹⁶ ASCBT, Triv. 1084, ff. 1r, 3r, 4v, 5r, 6v, 11r, 12v, 13r, 14v, 15r, 17r, 19r, 22v, 23v, 24v, 25v, 26v, 28v, 29r, 34v, 57r, 64v, 95r, 109r, 143r, 203r, 205r.

¹⁷ The documents and the other materials found as palimpsest in the Triv. 1084 have been studied for a preliminary inquiry presented at a seminar held on 12 June 2025 at the Archivio Storico Civico e Biblioteca Trivulziana di Milano, see the event program at <https://studistorici.unimi.it/it/un-codice-della-commedia-e-i-suoi-palinsesti-trivulziano-1084-ricerca-e-didattica-transdisciplinari>.

¹⁸ BCM, Manoscritti, Ms. II-E-02-006 (*Liber Primicerii*), ff. 137r, 140v, 141v, 144v, 145r, 147r, 148r, 149r, 152v, 160v, 161r, 162v, 163v, 165r, 166r, 169r, 171r, 177r, 179r, 180v, 182v, 185r, 186v, 187r, 188v, 199r.

¹⁹ As regards the history of the archive of the Metropolitan Chapter of Milan see RUGGERI, *Contributo alla storia dell'Archivio*; see also the introduction in BARONI, *Le pergamene del XII secolo*, pp. V-X. On the archbishop's medieval documentation see EAD., *La documentazione arcivescovile*. The records issued by the 13th century Milan archbishops have been published by Maria Franca Baroni in the *Gli atti dell'arcivescovo e della Curia arcivescovile di Milano nel sec. XIII* series.

²⁰ Regarding the treatment of palimpsests with chemical reagents during the 19th century see ALBRECHT, *Between Boon and Bane: The Use of Chemical Reagents in Palimpsest Research*.

originally applied to revive palimpsest texts. Today, however, they pose a significant concern for the integrity of the artifact and to the readability of the same texts they were meant to reveal. Given these circumstances, this case offered an ideal opportunity to apply the MSI methods to attempt to read these *scriptures* beyond the damages, in order to finally verify the liability of its existing edition²¹ and at the same time to try out the capabilities of this tool in dealing with such tricky situations.

The work initiated on the different case studies during the INTRADAMS Summer School has made it possible to uncover the intrinsic complexity of these artefacts. This sort of initial ‘excavation’ through the ‘layers’ of the palimpsests has already managed to bring important results in the studying of these materials, disclosing their high complexity and highlighting the potential such sources offer on multiple levels. First and foremost, for the material itself hidden beneath the surface of the currently visible text: discarded and erased in order to be reused, it is precisely this repurposing that paradoxically ensured its preservation over time, in a phenomenon well known to those who work with such sources. However, the potential does not lie solely in the content of the palimpsests — valuable though it is — but also opens up promising avenues of research into the practices of reusing book and documentary material in late medieval Italy²². What was the precise context of production and then discarding of these texts? What were the criteria for dismissing them? How did they end up converging to form the current manuscripts? All of these are questions that warrant further investigation.

On the other hand, the inherent heterogeneity of the chosen manuscripts contributed in making them perfect case studies for the purposes of the INTRADAMS Summer School. Their high level of complexity made it possible to fully capitalize on the heterogeneity of the students themselves and their specific academic backgrounds. Philologists, diplomatics scholars, paleographers, codicologists, and graduate students were all able to contribute: while experimenting with newly acquired technical skills — particularly those related to the processing of multispectral images — they also applied and shared their prior expertise in analyzing the emerging material. It was a collective effort that allowed us to expand our own knowledge and, at the same time, to generate new insights which, we hope, may serve as a useful foundation for a deeper understanding of the manuscripts and their ‘secrets’.

²¹ HEIMING, *Die ältesten ungedruckten Kalender der mailändischen Kirche*.

²² Studies concerning documentary fragments are quite recent and they are just now filling the gap with the more advanced research on fragments and palimpsests of book origins. On this matter, the Italian project REDDIS (REcycled meDieval Diplomatic fragmentS) constitutes a particularly avant-garde initiative directed at delivering a first mapping of documentary fragments existing in different conservation institutes in Italy, see MANGINI, *Recycled Medieval Documentary Fragments*; CARBONETTI - MANGINI - MODESTI - RUZZIN, *Il progetto Recycled meDieval Diplomatic fragmentS*. For other studies on the re-use of documentary fragments see also the contributes in the 2023 volume *Documenti scartati, documenti reimpiegati*.

What is certain is that the course has proven to be an excellent starting point for such projects and a major opportunity to generate a new cluster of scholars capable of joining traditional approaches for the study of manuscripts and documents with innovative methods to push even further the development of these disciplines.

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TITLE

Learning by Re-searching. The experience of the INTRADAMS Summer School at the Crossroads of Skill Acquisition and Knowledge Production

Imparare ri-cercando. L'esperienza della Summer School INTRADAMS all'incrocio tra acquisizione di competenze e produzione di conoscenze

ABSTRACT

The INTRADAMS Summer School (University of Milan) combines traditional manuscript studies with advanced digital tools like multispectral imaging to analyze palimpsests. Students actively work on medieval manuscripts such as Dante's *Commedia* (Triv. 1084), the *Liber Primicerii*, and the *Fragmentum Calendarii Ambrosiani*, uncovering hidden texts and documentary fragments. The program fosters interdisciplinary collaboration, enhancing both technical skills and historical knowledge.

La Summer School INTRADAMS (Università di Milano) unisce lo studio tradizionale dei manoscritti alle tecniche digitali avanzate, come l'imaging multispettrale, per analizzare i palinsesti. Gli studenti lavorano su codici medievali, tra cui la *Commedia* (Triv. 1084), il *Liber Primicerii* e il *Fragmentum Calendarii Ambrosiani*, scoprendo testi nascosti e documenti. Il programma promuove la collaborazione interdisciplinare, arricchendo competenze tecniche e conoscenze storiche.

KEYWORDS

Medieval manuscripts, Palimpsest, Reused Parchments, Interdisciplinary Teaching, Multispectral imaging

Manoscritti medievali, Palinsesti, Pergamene riutilizzate, Didattica interdisciplinare, Imaging multispettrale