The Montreal Codex: Architectural Amanuenses and Practices of Architectural Knowledge Production in Cinquecento Rome

In the brisk atmosphere of the Studio’s scriptorium, the muffled ebullience of Siena’s streets blended with the sounds of rasping wood, styli, and quills pressed to paper. Engrossed in the scriptorium’s dimness, a fledgling Francesco di Giorgio Martini (1439-1502) delicately drew landscapes, cornucopias, angels, and beasts on the pages of Alessandro Sermoneta’s exquisite copy of Albertus Magnus’s De animalibus (Figure 1).[[1]](#endnote-1) Before gilding and coloring the illuminations, di Giorgio prepared the parchment pages by laying out custom-made underdrawings with blind stylus, black chalk, straightedge, and compass. Underdrawings were preliminary drawings which prepared the illumination’s bound position for the application of gold leaves, ink, and color. They were often executed in hard point, metalpoint, or stylus, if less obtrusive guidelines were desired. Occasionally illuminators used an alternate method, applying the minuscule underdrawings not by drawing directly on the page but by tracing them from illustrations on an overlapped thin sheet of vellum. This would indent blind, almost indiscernible guidelines on the manuscript.[[2]](#endnote-2)

Before becoming an espionage expert proficient in the art of warfare, di Giorgio trained as a copyist and illuminator.[[3]](#endnote-3) At the Sienese *Studio*, which was also known as the *Casa della Sapienza*, di Giorgio concurrently illustrated a discourse on natural philosophy, read Plutarch, copied drawings of machines and fortifications from the manuscripts of Mariano di Jacopo il Taccola (1382-1453), and worked on the Opusculum de architectura (c.1470-75) and the *Codicetto* (1470-90).[[4]](#endnote-4) Di Giorgio’s predecessor Taccola had worked on both the De ingeneis and the De machinis (c.1424-1453) while living in the Studio and serving as its secretary.[[5]](#endnote-5) Known as the “Archimedes of Siena,” Taccola was trained as a notary, knew Latin, and discussed cranes and hoists with Filippo Brunelleschi (1377-1446). In addition, due to his knowledge of mathematics, he occupied the position of a Sienese *stimatore*.[[6]](#endnote-6)

The breadth of Il Taccola’s and Di Giorgo’s careers is emblematic of the type of practitioner produced by the *Studio* or developed through apprenticeship with its associates. As the institution’s name suggests, the *Casa della Sapienza’s* educational objective was to assimilate all-encompassing knowledge surpassing epistemic boundaries.[[7]](#endnote-7) Taccola’s and di Giorgio’s tenures at the *Studio* implicitly question any rigorous divide between the concepts of “scholar” and “artisan” in the context of Cinquecento Siena. It is additionally clear that the copying techniques practiced at the *Studio* were not developed solely to disseminate specialized scriptorial or draughting rules. They also informed the copyist’s knowledge of precedents, developing their proficiency in the subjects they illustrated. Thus, they inculcated apprentices into law, medicine, crafts, arts, and architecture.

After leaving the *Studio*, Di Giorgio’s subsequent career embodied its syncretic disposition. This is evident in the multifarious nature of the *disegno* recorded in his surviving sketchbooks *Trattato I* (c.1475-1480) and *Trattato II* (c.1490).[[8]](#endnote-8) Perhaps due to his work as illuminator, di Giorgio’s architectural folios demonstrate an operative merging of drafting and scriptural practices. On the pages of his Codex Saluzziano (1477-1487), for instance, the underdrawings intended to guide text layout were instead used to position, shape, and assign proportion to the architectural drawings (Figure 2).

The drawing procedures used to create the Codex Saluzziano’s folios reveal the didactic methods employed to form a particular type of *disegno.* Through scriptural making processes, the *Studio* educated not only scribes, but notaries, lawyers, artificers, and architects. The Studio’s *architectural* copying routine was a didactic exercise which habituated practical skills and developed subject expertise.[[9]](#endnote-9) The artists and architects educated in the Sienese *Studio* educated a significant number of their own followers. Therefore, this particular type of didactic *disegno* exerted a broader influence on the Cinquecento production of architectural knowledge*.* Di Giorgio’s apprentice Baldassare Peruzzi (1481-1536) adapted and propagated di Giorgio’s manuscript methods, his rationalizations and working techniques to his students like Sebastiano Serlio (1475-1554). These techniques were eventually disseminated in Rome, across the Italian peninsula and through Europe.[[10]](#endnote-10) Their influence is seen in architectural drafting procedures and drawing preparation methods used to create an anonymous *all’antica* copybook kept at the Canadian Centre for Architecture, whose origins have not been ascertained by previous scholarship.

In this article, I will trace the Montreal Codex via Baldassare Peruzzi’s circle in Cinquecento Rome to Quattrocento Siena.[[11]](#endnote-11) Remarkably, all of the Montreal Codex’s extant folios clearly exhibit underdrawings that coincide with manuscript copying and illuminating techniques developed at the *Studio*. To reveal the interrelated methodologies used to create the Montreal Codex, I will describe the drawing methods used to create the album, beginning with the first folio and gathering. By precisely following the draughtsperson’s methods step-by-step, I will graphically simulate the procedures used to make two of the Codex’s folios, beginning with the preparation of the paper and concluding with the shading and coloring of its Ancient Roman architectural illustrations.

I have examined the album under both raking and transmitted light to produce a comprehensive description of the pages as observed by the naked eye. By materially investigating how the Codex was produced, my work parallels research on the material conditions of drawings by Carmen Bambach and Mauro Mussolin. It also develops premises from technical art history and conservation proposed by Thea Burns, who examined the sketchbook in person, and is additionally informed by studies by James Ackerman and Cammy Brothers.

With new material evidence at hand, I will counter the broadly accepted hypothesis regarding the Codex. This explains its resemblance to Sallustio’s sheets at the Uffizi by positing the existence of a lost source text, which Sallustio and the Codex’s anonymous draughtsperson both copied.[[12]](#endnote-12) I propose a direct relationship between the Montreal Codex’s anonymous artist and the Sienese architect Giovanni Sallustio Peruzzi (c.1511-1572), the son of Baldassare Peruzzi, explicable due to their familial and professional relationship.[[13]](#endnote-13) In addition to the unquestionable overlap in subject matter between Sallustio’s drawings and the CCA album, Baldassare Peruzzi and Francesco di Giorgio share demonstrably similar drawing techniques (Figure 3). As di Giorgio’s trainee and a *camerlengo* for the *Compagnia dei Vignaroli* (bookkeeper who ruled and drafted his own account books), Baldassare was acquainted with the procedure of priming pages for both writing and drawing. He likely passed that knowledge to his followers and family members, including his sons Sallustio and Fra Onorio Perruzi.[[14]](#endnote-14)

# Finally, I will relate the techniques demonstrated within the Montreal Codex to technical descriptions written by Baldassare’s most prominent follower, Sebastiano Serlio. In his *Regole generali di architettura sopra le cinque manière* (1537) and in *Il terzo libro :* *nel qval si figvrano, e descrivono le antiqvita di Roma* (1540), Serlio famously claimed that the seven books are compendiums intended to convey architecture in its entirety to everyone inclined to the art, regardless of their ingenuity.[[15]](#endnote-15) For this purpose, Serlio described the measurements, draughting, and geometrical construction of ancient architecture according to Vitruvius’s Ten Books, while also acknowledging the potential variety of examples that might be created following this method. In the manner taught at the *Studio*, Serlio diffused drawings of architectural exempla alongside a guide for copying them, explaining that they were intended for emulation through *disegno*.[[16]](#endnote-16) To convey draughting procedures, Serlio’s representations in the *Regole generali di architettura* are organized in a manner that is strongly reminiscent of the Montreal Codex’s layout, structure and drawings (1537).

# The Montreal Codex

Dated to the mid-Cinquecento, the Montreal Codex is an unbound sketchbook consisting of twelve bifolios and nine folios filled with drawings of ancient Roman architecture. The history of the album before 1982 is obscure. Thus, it is difficult to speculate upon its original state of binding and its usage.[[17]](#endnote-17) In its current state, the CCA album is organized in three separate gatherings (defined as booklets of nested folded bifolia). Its second gathering has been tampered with.[[18]](#endnote-19) The brown ink numbering in the upper right corner of each page, and the gatherings’ numbering in the lower right corners of two sheets (001r and 011r), demonstrate that the extant sheets were part of a larger sketchbook that contained at least one more signature of nine bifolios (Figure 4).

As it survives, the sketchbook’s first gathering comprises three bifolios and four folios with sketches of building fragments, such as elevations of arcades and details of fragments such as parts of entablatures. The drawings appear organized by the purpose of the elements in question: arcades are next to arcades, Corinthian entablatures next to Corinthian entablatures, and so on. This booklet contains a perspectival elevation of the arcades from the Forum Holitorium, an elevation of a Tuscan arcade from the Temple of Claudius under the Basilica of Saints John and Paul on the Caelian Hill, two columns from Tivoli without entablatures, and perspectival sections of two separate Roman entablatures on one folio (Figure 5). The folio’s assemblage of fragments from different buildings and its pervasive annotations suggest that this gathering was not intended to portray the parts of a particular antique building. Instead, it compiled variations of a certain architectural element.[[19]](#endnote-20)

The second surviving gathering has one bifolio and five folios. In contrast to the first gathering, the drawings in this booklet are organized around certain edifices. The Temple of Vesta at Tivoli is represented in elevation and plan. A separate sheet is dedicated to rendering details, including a window, cornice, and a column. A similar pattern is demonstrated for building drawings that resemble the Temple of Hercules Victor at the Forum Boarium. The Temple of Hercules Victor, like the Temple of Vesta, is rendered in a perspectival elevation, plan, and details (Figure 6). This gathering seems structured similarly to compendiums on ancient edifices such as Serlio’s *Il terzo libro* (1540),However the presence of a sketch also found in Serlio’s *Regole generali* (1537), alongside the partial survival of the gathering, does not suggest a unifying, clear theme for this gathering.

The sketchbooks’ page enumeration suggests that there once existed at least one additional booklet that is currently missing. The extant fourth gathering consists of eight bifolia filled with an extraordinary selection of centralized plans of temples, baths, and baptisteria (Figure 7). Most of the sheets contain a larger plan which occupies the upper portion of the page, paired with a smaller plan placed in the folio’s lower portion. In contrast to the rest of the album, the fourth gathering’s plans are frugally annotated and rarely identified. These distinctive plan arrangements are also found on two sheets at the Uffizi attributed to Baldassare’s son Giovanni Sallustio Peruzzi (Figure 8). Remarkably, the plans on Sallustio’s sheets also match the pairing and arrangement of the plans in the Montreal Codex.[[20]](#endnote-21)

The craftsmanship of a volume is telling of the book’s purpose because the mechanical operation of the book depends on its structure.[[21]](#endnote-22) The CCA notebook is unbound in its present state. However, there is evidence that its pages were attached in the past. As described by Thea Burns, former chief conservator at the Weissman Preservation Center of Harvard University, the Montreal codex’s string, thread structure and looping indicate that the Montreal sketchbook might have been bound similarly to the Mellon Codex in pasteboard covers (laminated sheets of paper) covered with vellum.[[22]](#endnote-23) Other comparable codices of the Quattrocento possess bindings that reveal their usage. As summarized by Margarita Fernández Gómez, the Codex Escurialensis was originally bound in tanned vellum covers on wood boards for durability.[[23]](#endnote-24) Conversely, the Aspertini Codex was simply fastened in parchment to enable everyday handling, frequent transport, and upkeep.[[24]](#endnote-25) In stark contrast to the Escurialensis and the Aspertini, the Barberini Codex is enclosed in stunning covers of parchment on wooden boards secured with metal buckles that reaffirm its exceptional status. Since material evidence indicates the Montreal Codex was previously bound comparably to the Mellon Codex, it might be hypothesized that it was a working notebook (Figure 9).

Green Fibers, Prick Intervals, and Bounding Lines

The Montreal Codex’s initial folio contains a reconstruction of the Tuscan temple under San Nicola in Carcere in Rome (001, Figure 10).[[25]](#endnote-26) The drawing is graciously executed, immaculately arranged and artistically vivid. Drawn on the *metà muta* half of an antique laid, trimmed-down *mezzana*paper format (originally 345 X 515 mm), the ancient fragments rest on elaborate underdrawings executed using a blind stylus, straightedge, and compass.[[26]](#endnote-27) The half of the sheet that displays the watermark is the *metà parlante* and the half without the watermark is the *metà muta*.[[27]](#endnote-28) Beneath the ink and the wash, the preliminary guidelines that generated the San Nicola in Carcere composition are clearly visible. These underdrawings have gone unreported by historians. So have the layered matter and drawing gestures situated below the ink, which indicate the craft of *disegno*.[[28]](#endnote-29) Likewise, the similarities between the architectural preparatory *mise-en-page* evident in this folio and a scribe’s preparatory routine for manuscript copying have passed unnoticed by scholars. The intricate network of pricks, blind stylus lines, and compass aids reveals that the draughtsperson determined the rendering in great detail before applying ink in a manner comparable to the methods of scribes and illuminators.

 On the album’s first folio, a draughtsperson started in the upper right corner of the page by pricking a custom scale over a blind stylus line, using a sharp instrument such as an awl, a stylus, or a compass (Figure 11). This is comparable to the scribe’s initial marking of a folio or bifolio using a knife or pricking wheel to indent or perforate small marks on the parchment or the paper. For scribes, these initial prick marks, most commonly positioned in the margins of the page, subdivided the page into equal parts that guided the page’s subsequent ruling.[[29]](#endnote-30) The subdivisions’ dimensions were determined by the size of the folio or bifolio and by the layout requirements of the anticipated text. In short, the initial prick marks concurrently customized the page to the text and scaled the text to the page. With a similar purpose in mind, the draughtsperson of the Montreal Codex’s first folio pricked the “referential scale” in the folio’s margin to correlate the drawing to the folio. The scale was used as a drawing device for draughting the underdrawings.

 After positioning the “referential scale” in the upper right corner, the Montreal Codex’s draughtsperson proceeded by determining the page’s median with the help of a compass.[[30]](#endnote-31) This process is indicated by the blind compass curves imbedded in the upper and central regions of the sheet. Following this, the artist connected the compass marks with a straightedge by drawing a vertical blind stylus line mid-page. The middle vertical line became the composition’s main alignment guide. As soon as the scale and the middle blind verticals were scored into the paper, the parts of the Tuscan order were delineated. The draughtsperson marked the thicknesses of the cornice, frieze, abacus, neck, ovolo, column, fillet, torus, and plinth, on the custom referential scale and the median line, by pricking subdividing markers from top to bottom.[[31]](#endnote-32) The task required a remarkable level of precision, as the spacing between these elements is minuscule. These thickness markers appear as fine punctures of the paper. They could have been made with a thin needle, a knife, or an awl. Following this, the artist might have transferred the Tuscan order’s thicknesses from an overlapped exemplum by simultaneously piercing two sheets of paper. Perhaps the drawing to be copied already carried the piercings. An overlap of two or more sheets of paper would explain the diminutive size and finesse of the punctures.

 After piercing the parts’ sizes along the verticals, the draughtsperson ruled a set of horizontal blind stylus lines that connected the corresponding prick marks. In histories of the book, marking horizontal lines between the margins’ prickings is known as *ruling* and the resulting lines are called *bounding lines*.[[32]](#endnote-33) Ruling, in general terms, was employed to guide the justification of the text and its ancillaries on the page. The layout of a page was determined by considering its readability and scribal economics. It was additionally guided by scribal expertise and preference, influential exemplars, the genre of the text (Biblical texts, for example, were usually written in two columns), and the physical size of the manuscript.[[33]](#endnote-34)

 The practice of ruling in manuscript production dates to the fourth century. Describing early procedures of ruling manuscripts, ubiquitously used in later centuries, historian Leslie Weber Jones writes:

For the actual ruling of the text-lines by this method a *bifolium* is outspread and two single vertical lines of prickings made one on the left-hand folio and one on the right-hand folio. A broad ruler is then laid horizontally across both parts of the outspread bifolium and both parts are ruled at the same time. In this way each text-line is drawn between two prickings.[[34]](#endnote-35)

Unsurprisingly, illuminators used similar techniques to lay out miniatures. Before any use of black chalk and ink, illuminators enhanced the space framed by the scribe’s ruling of the text, which was intended to be filled by the illuminator, by supplementing it with underdrawings tailored to each design separately.

 The final preparatory steps for drafting the Tuscan temple under San Nicola in Carcere concerned the underdrawings. These were augmented by stylus, and outlines of the columns and the entablature were drawn in greater detail. At this stage, the perspectival depth would have been outlined with a straightedge and blind stylus. The paper was styled and ready for quill and ink. After going over the furrowed blind stylus lines with ink, the draughtsperson would have used animal-hair brushes to shade and color the fragments in ink wash (Figure 11). As soon as the perspectival underdrawings were layered, the desired architecture would spring from the paper in a pareidolic manner.

 In its current state of completeness, the rendering of the Tuscan temple under San Nicola in Carcere displays incomplete silhouettes, perplexing shadows, and an exaggerated perspective that is not uniform across the page. The entablature’s perspective does not relate to the plinth’s perspective at the bottom of the page, nor to a vanishing point. Additionally, the Temple’s shadowing appears apportioned between two illustrators and the separate types of shading are incongruous. One kind of shading appears as though it were intended to render the geometry of its order (as if independent of a light source). The other materializes as if it were intended to evoke a light source positioned above and to the left of the page. The two types of shading are not synchronized; they clash, as seen at the entablature’s cornice, for example. By contrast, other entablatures from the Montreal Codex depicted in perspective, such as the detail from the Temple of Vespasian and Titus, are geometrically constructed toward a single vanishing point and display consistently colored shadows across the page. The discrepancies in skill apparent on the Codex’s pages corroborate a supposition that additional hands were at work on its sheets. The rendering of the Tuscan temple under San Nicola in Carcere could have been done by an architectural amanuensis.

Preparing sheets with pricks, blind stylus, and compass aids was not uncommon in general practices of architectural *disegno*. For example, there is an explicit use of pricking, ink marks (dots), and horizontal blind stylus lines running between both pricks and dots on Giuliano da Sangallo’s presentational sheets for the design of the San Lorenzo façade (276A, 280A, Uffizi) and his folio for the façade of the Papal Trumpeters’ Loggia (283A, Uffizi). As a technique, pricking was familial to the representational arts beyond the manuscript tradition. Easel and fresco painters regularly pricked drawings and cartoons to transfer their designs to panels, canvases, and walls employing the *spolvero* and *calco* techniques.[[35]](#endnote-36) However, the manner of ruling and pricking evident on the pages of the Montreal Codex is not similar to the craft of making presentational drawings, nor to practices originating within from the painter’s workshop. While cartoon prickings faithfully followed the silhouettes of the figures being copied, the prickings on the Montreal drawings position the blind stylus underdrawings (guidelines) rather than the traced image’s exact outline. As such, this copying technique departs from the process of marking out lines as found on the *ben finito cartone.* Instead, the technique is related to practices habitually found in scriptoria.

The copying preparation routines found in the Montreal Codex are closely related to the *Studio’s* copying practices, as evidenced by surviving folios produced by the *Studio* such as Sermoneta’s De animalibus (1463). Not intended to merely replicate designs, the process used for the Codex’s underdrawings indicatetraining practices intended to instruct the amanuensis, inculcating knowledge through copying. The example-laden practice of copying developed by the *Casa della Sapienza* reveals the Quattro- and Cinquecento notion of copiousness and abundance.[[36]](#endnote-37) Through repeated precedent copying, an amanuensis emulated precedents, such as Ancient Roman examples of architecture. By doing so, they stocked an abundance of architectural riches in the habitual disposition of their personal *disegno*. Thus, the affiliation between pricking and ruling methods in the work of apprenticed amanuenses is not accidental, but paradigmatic. Whether made by a scrivener or draughtsperson, the marks established on the page reveal priorities and traditions beyond a desire for a tidy *mise-en-page*.[[37]](#endnote-38)

A noteworthy example from the Montreal Codex’s first gathering, which demonstrates the pricking and ruling practices of two hands at work in chorus, is found on a bifolio displaying an annotated representation of the opulent Corinthian entablature of the Temple of Vespasian and Titus in Rome (007, Figure 12). On this folio, it appears that an apprentice began by preparing the page and positioning the drawings, stopping abruptly at the entablature’s profile. Using black chalk, which was known as “the tool of the skilled,”[[38]](#endnote-39) a more confident hand revised the preparatory drawing, evidenced by rectifications to its profile (Figure 13). I speculate that this dexterous “hand-at-liberty” also drew the perspectival underdrawings. On this sheet, both the underlines and the lines that indicate the depth of the entablature correspond to each other. They meet at the same vanishing point marked with black chalk just below the flower detail marked “S.” The entablature’s cornice appears once again in the album, drawn in a freehanded fashion and oriented to the left, on a later folio with a negligible amount of prickings and underdrawings. The material evidence indicates this type of sketch could also be executed without many provisions, as though the artist drew such details so routinely they could be performed out of habit (Figure 5).

Additional sheets of the Montreal Codex exhibit layouts, subject matter, and illustrative methods which resemble examples later published by Serlio*,* making it plausible that this Codex was used as a reference book by practitioners from Baldassare Peruzzi’s circle. Rather than demonstrating an idealized Corinthian order, all of the fragments on the sheet dedicated to the Temple of Vespasian and Titus are from the same edifice, depicting all the parts of the temple (Figure 12). Such thematic organization of ancient fragments parallels the structuring of Serlio’s *Regole generali di architettura* (1537) and *Il terzo libro* (1540).[[39]](#endnote-40) For instance, in the chapter on the Doric order in Serlio’s *Regole generali di architettura* (1537) a page dedicated to entablatures demonstrates an elevation of a Doric frieze with triglyphs and metope, two perspectival sections of separate entablatures alongside extracted details, and the capital of a Doric column and pilaster.[[40]](#endnote-41) By contrast, in his *Il terzo libro* (1540), Serlio organized his folios according to the building in question. Following the plan of the Roman Colosseum, Serlio introduced the Colosseum’s section, partial elevation, and fragments with details.[[41]](#endnote-42) The overall organization of the Montreal Codex’s Temple of Vespasian and Titus page makes this sheet particularly evocative of representations found in drawn and printed collections of ancient temples. They not only resemble Serlio’s *Il terzo libro* but also Baldassare Peruzzi’s drawing of the entablature at the Forum of Nerva (389A, Uffizi) (1540).

Along similar lines, the Montreal Codex’s fourth gathering’s organizational premise and subject matter correspond strongly to Serlio’s fifth book *On Temples* (1547). The Temple of Vespasian and Titus sheet of the Montreal Codex belongs to the same gathering as the San Nicola in Carcere folio. It is alongside other details of ancient temples such as the entablature of the Temple of Antonius and Faustina. Therefore, it is surmisable that the album’s first gathering was dedicated to views of ancient Roman temples and their fragments, as is Serlio’s fifth book. If the categorizing principle of the CCA album does follow an organizational pattern comparable to Serlio’s *I Sette libri*, then it can be speculated that the CCA album was an early draft for an analogous treatise or a manuscript version equivalent to such printed treatises. This explanation would help explain the organization of the drawings, the didactic nature of the *disegno*, and the quality of the album’s materiality.

The watermarks on the paper used for the album’s first gathering give us additional clues regarding the Codex’s production and use. Whereas the San Nicola in Carcere fragment was drawn on the *metà muta* half of its bifolio that does not display a watermark, the Temple of Vespasian and Titus entablature is drawn on the *metà parlante* half that bears a watermark.[[42]](#endnote-44) The paper’s watermark is easily discernible: it depicts three flowers sprouting from a single stem inscribed in a circle and surmounted by a star. The sheets’ identical watermarks and chain-line distances reveal that all extant pages of the codex were produced by the same paper maker. According to Charles-Moïse Briquet’s album of watermarks *Les Filigranes* (1907), the three-flower watermark’s provenance is Fabriano, circa 1543 (Briquet 6683).[[43]](#endnote-45) In accordance with Briquet’s date, the Montreal Codex could have belonged to a member of Sallustio Peruzzi’s circle in Rome during the interval between Baldassare’s death and Sallustio’s departure for Vienna in 1567.

The paper’s provenance, quality, and size, along with the drawing techniques used for its making suggest that the Montreal Codex might have been a practice draft notebook. According to Thea Burns’s unpublished report on the Montreal Codex, the quality of its paper was considered mediocre.[[44]](#endnote-46) During her examination of the pages, Burns noticed traces of shives and green fibers in the Codex’s paper furnish, which suggest that the paper was considered agreeable but not of the finest quality.[[45]](#endnote-47) This means that the CCA album was probably not a model book, like the Geymüller Codex or Barberini Codex; nor a personal sketchbook like the *taccuino senese* by Giuliano da Sangallo (1443-1516)*.* The Geymüller Codex (408 x 580 mm), attributed to both Antonio da Sangallo il Vecchio (c. 1455-1534) and Francesco da Sangallo (1494-1576), is a large bound book, assembled from various makes of thick paper. It most likely acted as a family heirloom assembled over a long period and unremittingly passed along as inheritance within the Sangallo family.[[46]](#endnote-48) Comparably, Giuliano’s Barberini Codex is a large (785 x 455 mm) high-quality compendium of carefully curated ancient architecture drawn on vellum. The Montreal Codex, a sketchbook of mediocre paper quality and intermediate format, whose annotations and underdrawing content suggest it was used as a guide to drawing, was probably put to use at a workshop.

Bearing in mind that Serlio and Labacco perused Baldassare Peruzzi’s drawings to develop their illustrated publications, the CCA compendium may have been a group product comprised of illustrations intended for a treatise.[[47]](#endnote-49) The thread sashaying through the second gathering, which suggests that the sketchbook was sewn on cords and bound, and the foxing and heavy staining of the sheets’ lower right corners, corroborate the premise that the Montreal Codex was frequently perused. Indeed, its pages are satiated with fingerprints in various makes of ink which indicate both multiple users and heavy use.[[48]](#endnote-50)

An Incomplete Frontispiece

The second gathering’s theme is more mysterious and puzzling (Figure 14). The gathering begins with a partial depiction of a Doric entablature with half a column juxtaposed against a pasted piece of paper that bears half a drawing of an architectural frame strongly evocative of frontispieces of Cinquecento architectural treatises.[[49]](#endnote-51) Sketched in black chalk and ink, the pasted paper displays the right half of an elaborately framed portico flanked by an androgynous herm and surmounted by a lavish cornucopia slouching down toward the herm’s face. Suggestive of a motif that would dominate the frontispieces of architectural treatises for years to come, its composition is reminiscent of the frontispiece of Serlio’s *Regole generali di architetura* (1537) and Antonio Labacco’s *Libro* (1559).[[50]](#endnote-52)

The draughtsperson of this folio accurately followed the meticulously prepared underdrawings, using the same method as the one used to draw the San Nicola in Carcere fragment. In contrast to the roughly sketched Doric fragment on the frontispiece, the second extant sheet of this gathering displays a neatly rendered column base from the Temple of Serapis, known as the Frontispizio di Nerone, and an entablature from the Church of Sant’Angelo in Pescheria (012, Figure 15). First, the draughtsperson applied a vertical “referential scale” in the top right corner of the page. Then they prepared the folio by pricking and ruling the underdrawings that had been custom-tailored for drafting the fragments at hand. After applying the underdrawings, the artist sketched the fragments’ outlines in red chalk, which are still visible under the architrave’s profile. Red chalk was used for transitional outlines to be retraced and corrected and could have demonstrated either a preparatory stage to be checked or an alternative copying procedure.[[51]](#endnote-53) Finally, after outlining the fragments in red chalk, the draughtsperson inked the architecture with straightedge and compass and colored it with brush and wash.

The Corinthian fragments are neatly delineated and colored, but the shading method is unusual. In the geometrical sketch of the Frontispizio di Nerone’s column base, the compass’s geometrical aids (circular guidelines used to construct the concave curve of the torus inferior, scotia, and torus superior) have been inked and tinted as though they are parts of the architecture. This is explicitly noticeable at the outside edges of the base (Figure 15). The drawing aids could have been marked in ink either out of negligence or intentionally. Given that the drawings aids are outlined on both of the base’s sides uniformly, it seems plausible that this was done by design.

If the underdrawings of the column base of the Frontispizio di Nerone were purposefully, rather than accidentally, traced in ink, this could indicate the drawing’s intention was pedagogical. Its purpose might be to demonstrate the provisional use of geometrical drawing devices congruent with the purpose behind Serlio’s publication. A similar depiction of a column base alongside the guidelines for its geometrical construction is present in Serlio’s *Regole generali di architettura* (1537). Serlio demonstrates the compass and the straightedge guidelines used for the construction of the Doric, Ionic, and Corinthian column base in an analogous routine (Figure 16). The Frontispizio di Nerone’s column base rendering is rare; similar *all’antica* compendiums do not have comparable drawings. Neither the Codex Barberini nor the Mellon Codex contains any sketch of a base that outlines its geometrical construction so conspicuously.

Geometrically instructive drawing techniques are prevalent on the Frontispizio di Nerone folio. The geometric construction labeled “Y” is an additional didactic illustration. A similar “diagram” is once again found in Serlio’s *Regole generali di architettura* (1537, Figure 16)*.* In the *Regole generali di architettura*’schapter on the Doric manner, recalling the authority of Vitruvius, Serlio demonstrates that the height of a Doric façade’s frontispiece, to use his terminology, can be determined with a compass and a straightedge through referential ratios taken from the length of the architrave. Under the text describing the procedure, Serlio added a sketch that illustrated the construction.[[52]](#endnote-54)

The Montreal Codex’s “Y” illustration is not identical to Serlio’s, as it indicates a different ratio. However, it is extracted from the architrave and it marks the same relationship between length and height as Serlio’s schema. Set adjacent to exceptional Corinthian architectural fragments, this illustration was most likely intended as a device to geometrically determine the height of the Corinthian pediment in the same manner as Serlio’s instructions for the Doric. This little drawing, when compared to similar demonstrations of architectural *disegno* techniques, hints at the drawing’s instructive purpose and the Montreal Codex’s intended audience.

Finally, the ink on this folio is distinctive. It clearly demonstrates that no less than two types of ink were used on the folios of the Montreal Codex. During the Cinquecento, the majority of various makes of iron gall ink and soot ink would have appeared black upon application. However, inks age idiosyncratically, changing color and opacity depending on the admixture of their iron-gall compound.[[53]](#endnote-55) On the CCA drawings, especially on the Temple of Serapis folio, two types of ink are easily distinguished by the coincidence that one appears brown and has an ochre tint, while the other is grey with a colder tinge.[[54]](#endnote-56) Currently, I cannot claim that the different hands at work used separate inks at all times; they might have used them synchronically or diachronically, or used more than two makes of ink. Although both shades of ink can be seen on some sheets simultaneously, the brown ink seems to be dominant on the folios drawn by the amanuenses, including the sheet bearing fragments from San Nicola in Carcere. The darker ink is pervasive on the folios of the Codex’s last gathering and on roughly sketched architectural representations, such as the Doric order next to the pasted frontispiece sketch.

Aside from the difference in ink colors in the second gathering, the artists’ varying use of its coloristic potential confirms that additional artists worked on the album.[[55]](#endnote-57) For instance, beginning with the oblique perspectival depiction of the Temple of Vesta in Tivoli (021) the ink wash is applied evenly and its pale brown color is uniform. This is especially noticeable on the plans that follow. There is also an increased use of black chalk over extensive, exacting blind stylus underlines, which indicates a different hand than the one which created the earlier pages.

On an unmarked plan of what provisionally appears to be the Temple of Hercules Victor (024, even though judging by the eighteen columns this plan is incongruent with the temple, which had twenty columns), immaculately executed blind stylus underlines lay out the geometry of the building, i.e., the manner of the plan’s construction, through *disegno*. Blind stylus lines first outline the concentric circles, then divide the interior circle into six parts that position and define the window openings (Figure 17). The walls are traced in ink with a compass adeptly and precisely. Handling a compass dipped in ink was no easy task, as a draughtsperson needed to act swiftly to match the velocity of the seeping ink. Perhaps the ink differed in density according to the instrument perused for its suspension (whether quill or metal compass). Ink inscriptions in the shape of an “X” mark the intersections of the blind stylus underdrawings and the inked line of the interior circular wall. This indicates that the underdrawings were not used merely to construct the plan; once again, they overtly demonstrate the draughting procedure.[[56]](#endnote-58) In contrast to the drawing and shading methods used in this folio, the second gathering’s first sheet contains a Doric entablature upon which the ink wash is not applied evenly. It is executed with overlapping brush strokes, and the color varies from pale brown to dark and gray.

Economy at Work and the Peruzzi Circle

 The last extant gathering of the Montreal Codex consists of eight unbound bifolia depicting an exquisite collection of centralized plans (Figure 7). These are the drawings that have impelled scholars such as John B. Bury and Cammy Brothers to describe the sketchbook as exquisite and unique.[[57]](#endnote-59) As reported by Brothers and additional scholars, plans from the Codex’s last gathering are also found on two sheets at the Uffizi attributed to Baldassare’s son Giovanni Sallustio Peruzzi (Figure 8). In addition to the plans, the bifolia are exceptional for the draughting and copying procedures they embody. The examples from the previous two gatherings demonstrate pricking and ruling techniques tailored to draughting each architectural page separately. Conversely, the bifolios of this gathering illustrate techniques adjusted to ruling identical guidelines simultaneously onto multiple pages. Such a page preparation method was conventional for scribes in the process of copying manuscripts. Depending on the thickness of the vellum or the laid-paper folios, a scribe would regularly stack multiple open bifolios, simultaneously pricking and ruling all the sheets at once to ensure the precision, evenness, and the economy of the preparation process.[[58]](#endnote-60)

This page preparation method is found on the bifolios of the Montreal Codex’s final quire. The draughtsperson began by ruling two sheets at a time. By exerting controlled pressure with the blind stylus over the top page, the architect endowed two folios with the same incised linear indentations, even though the underdrawings were intended for draughting separate plans. These identical underdrawings were then used to construct the various plans and arrange the drawings on the sheets. The observation that the pages were prepared by stacking them is corroborated by comparing the depth of the blind stylus line incisions. They are more pronounced on the first of the two sheets (which would have been the top folio) and shallower on the second sheet (which would have been the folio underneath). Stacking the plans (two by two) over a lightbox exposes the plans’ overlap –a result of the identical guidelines– in an unambiguous manner (Figure 18).

By comparing the guidelines on the pages, it is revealed that the page showing the plan of a temple from Palestrina reminiscent of S. Maria degli Angeli in Florence (Figure 18) was ruled simultaneously with the page showing a plan identified as a building near Palestrina (Figure 19). Likewise, the folio displaying a structure that has been identified as the Tomb of Romulus on the Via Appia and the Baptisterium in Galliano (020) was simultaneously ruled with the page depicting a temple that is reminiscent both of S. Constanza in Rome and the mausoleum Tor de’Schiavi also in Rome (021). The folios displaying the Apollo Temple at Lago Averno in Pozzuoli (022) and the Temple of Minerva Medica in Rome (023) demonstrate the same technique. Exceptions are made for the pages illustrated with matchless representations, such as the ground plan of the Serapaeum of Hadrian’s Villa at Tivoli (024).

After priming the sheets in this manner, the artist proceeded by working on each folio separately. Aside from the prick marks resulting from positioning the compass centrally, visible on pages with circular or centralized plans, no other prick marks overlap between the sheets. Similarly, certain blind stylus guidelines do not repeat on additional pages, demonstrating that the artist continued adding underdrawings to specific pages after the initial ruling, just as an illustrator would add customized guidelines to individual pages of a manuscript before sketching illuminations. Before outlining the plans with ink and coloring the wall masses in wash, the draughtsperson sketched in black chalk. All the folios of the last quire exhibit traces of black chalk. Black chalk was the scribe’s and illuminator’s medium of choice, since they rarely used red chalk for sketching in books. Black chalk was also Baldassare Peruzzi’s medium of choice: black chalk drawings greatly outnumber his red chalk sketches.[[59]](#endnote-61) Regardless of the draughtsperson’s identity, the ubiquitous presence of black chalk on the pages of the last gathering insinuates that they were skilled. Adroitness, speed, and economy defined the practice of the skilled artist: not coincidentally, these are also priorities of *disegno*.[[60]](#endnote-62)

Cinquecento architects sporadically “mirrored” drawings. They traced silhouettes of fragments and buildings visible on a folio’s verso to its recto, or vice versa, in the pursuit of rapidity. Michael Hirst and Johnathan Foote have cleverly discussed Michelangelo’s use of drawings found on one side of a sheet as instigators of illustrations found on the other face of the same sheet.[[61]](#endnote-63) I have noticed an additional example of such recto/verso copying on Giovanni Antonio Dosio’s depictions of the Pantheon at the Uffizi (Figure 19). However, Dosio’s sheets, most likely part of a compilation for a treatise, demonstrate a recto/verso copying of architecture and not a doubling of underdrawings and *mise-en-page* guidelines. In short, by “mirroring” the outline of the edifice, Dosio was ensuring that the Pantheon’s elevation and section corresponded in proportion and scale.[[62]](#endnote-64) Thus, the technique of ruling underdrawings simultaneously over multiple folios, as seen on the pages of the Montreal Codex’s last gathering, diverges from the previous examples.

The Montreal Codex’s consistent drafting procedure prioritized the routine of making over the representations. This, in turn, significantly influenced the proportionality of the plans. For instance, a version of the three-aps-rotunda with an ambulatory-like column division is also found on a sheet by Giovanni Battista Montano (1534-1621) at the Drawing Matter Collection in Somerset.[[63]](#endnote-65) Even though the plans are inscribed with identical dimensions, the proportionality of the narthex compared to the edifice differs considerably between the two drawings (Figure 20). This discrepancy might be attributed to the Montreal Codex draughtsperson’s representational technique. The artist’s curatorship of the plans, including the plans’ arrangement and pairing on the page, was affected by the underdrawing’s drafting procedure as well. Drafting identical guidelines for diverse plans, as a drafting methodology, would have guided the artist to select particular plans over others and pair them in accordance with each other.

These observations, considered alongside the refined finish of the Montreal Codex drawings, support the assumption that this book was not solely an apprentice’s journal, even though it was done by artists of various skill. The emphasis placed on the instructional qualities of the *disegno* –the geometrical devices, the uninhibited perspectival modifications, and the traces of drawing corrections– indicate that it was not a master’s model book either. Generally, volumes dedicated to demonstrations of expertise and commission procurement did not exhibit drawing rectifications in such a conspicuous manner.[[64]](#endnote-66)

In light of this new evidence, it is surmisable that Sallustio’s sketches may have been preliminary drafts for the CCA book, rather than concluding that both folios are copies of a third unrelated sample.[[65]](#endnote-67) Determining the plan combinations and the draughting technique would have required curating; Sallustio’s sheets could have served that purpose. As shown, each larger centralized plan of the Montreal Codex is paired with a smaller edifice on the sheets. Sallustio’s sheets pair the plans and edifices in the same manner. Alternatively, Sallustio might have copied his drawings from the Montreal Codex, as Brothers claims.[[66]](#endnote-68)

Brothers also notes that the authors of the Montreal Codex were most likely not Tuscan. On the folio with the plan of the Temple of Minerva Medica, the measurements are given in “braza”– a descriptive oversight that probably referred to the Tuscan *braccia*.[[67]](#endnote-69) Given that there are other folios by Sallustio which are strongly reminiscent of the Montreal Codex’s subject matter (663A, 665A, and 684A, Uffizi), it seems plausible that the Montreal Codex belonged to Sallustio’s Roman circle. Ann C. Huppert has convincingly argued that Serlio’s debt to Baldassare extends beyond his use of some of the master’s representations. Huppert claims that the elder Peruzzi influenced Serlio’s understanding of Vitruvius, as well as the didactic intentions and the subject matter of his publishing endeavour.[[68]](#endnote-70) Taking into consideration the parallels between Sallustio’s folios and Serlio’s work,[[69]](#endnote-71) the Montreal Codex’s drawing organization and the procedures by which it was made indicate that its creators were associated with the Sienese circles in Rome and the Peruzzi family.[[70]](#endnote-72)

Given that (1) the Ancient Roman fragments included in the Montreal Codex were considered worthy of imitation, (2) the Codex’s *disegno* rests on sanctioned copying techniques taught at scriptoria *and* workshops, (3) the folios relay instructive procedures and devices for geometrical manipulations, and that (4) the format and the quality of the Codex indicate frequent use and wear, I argue that this book was a demonstrational volume made as a workshop training compendium. In this role, it might have acted as the backdrop of “begetting” architecture, a source for the architect to innovate and produce endless variety through *disegno*.[[71]](#endnote-73) The Montreal Codex’s purpose might have been similar to the intention of Serlio’s treatise, although it remained in manuscript form. The book can be interpreted as instructional if we imagine the teaching process as part of a kinaesthetic teaching and learning methodology, to use contemporary terminology. Through repetitions of drawing procedures, rather than rote copying of drawings, the apprentice was inculcated with the veritable cornucopia of architectural exemplars present on the CCA folios.

Drawing as Material Practice Beyond Optical Image

The Montreal Codex is exceptional for its assortment of centralized plans and remarkable for the *disegno* it embodies. That the sketchbook has not received much scholarly attention is perplexing. It is an extraordinary object with a particular appearance, heft, scent, and an historical purpose that emerges through investigation. Importantly, it is a notebook that is not reducible to its graphic content nor its historical position. Nevertheless, architectural historiographical inquiries regarding how the Montreal Codex was made, based on its material appearance, are not to be found. By studying the Montreal Codex through a materialist approach, i.e. by examining both its architectural content and its qualities as an artefact, this inquiry answers certain questions concerning the sketchbook’s creation, purpose, and use. After investigating the codex’s paper, stylus lines, black chalk traces, ink marks, drawing practices, representations of fragments, views, and plans, I contend that the album operated as a training device to those who participated in its assemblage and to its intended public.

The craft of *disegno* on the Montreal sheets comprised practices of pricking and ruling underlines also used in scriptoria. Its working method demonstrates that copying was not conceptualized as a mere act of cloning. Instead, knowledgeable purposefulness was inherent in the copying act itself. Theorized as a copious proliferation of examples, whose embodiment through the act of *disegno* became a bodily, habituated practice (which differs from cognitive memorization), copying would create a learned and knowledgeable artist. The act of copying epitomized a means of cultivating architects and representing architectural exemplars.

Given their similarities in content, it is likely that the Montreal Codex’s purpose was comparable to the intention of Serlio’s publications. Baldassare Peruzzi was the greatest impetus for Serlio’s emulations of Ancient Roman architecture, upon which Peruzzi based his instructive methodology. Publishing Roman architectural precedents was crucial to Serlio’s intention of integrating all architectural knowledge in a publishing venture. This exhaustive compilation of precedents was common to other disciplines beyond architecture. Such an effort towards integration is to be found in Albertus Magnus’s De animalibus, in which Albertus sought to coalesce Avicenna’s, Galen’s, and Aristotle’s ideas with his own thinking about the animal world.[[72]](#endnote-74)

With a comparable ambition to syncretize knowledge across diverse fields and vocations, the *Casa della Sapienza* helped Siena become a center for learnedness in the Quattro- and Cinquecento, attracting knowledge-seekers from all over Europe.[[73]](#endnote-75) As such, the *Studio* also represented a locus for the exchange of ideas, knowledge, and experience. Certain of its acolytes later completed architectural work following their time at the *Studio*. Francesco di Giorgio decorated a copy of the De animalibus for Maestro Alessandro Sermoneta, a teacher at the *Casa della Sapienza*, who hosted both the Duke of Urbino, Federico da Montefeltro (1422-1482); and the Duke of Calabria, Alfonso (1448-1495), son of King Ferdinand I of Naples. Di Giorgio was later hired to design fortifications by both dukes.[[74]](#endnote-76) During the Cinquecento, the desire to integrate knowledge did not exist in an isolated manner sequestered in the realm of texts. It expanded to the arts, architecture, and even music.[[75]](#endnote-77) Thus, it is surprising that architectural historians so rarely and sporadically investigate places like the *Casa della Sapienza*as sites of exchange of not just theoretical knowledge, but of making techniques and practices.

With this study, I propose a stronger research relationship between architectural historiography, technical art history, and conservation on the subject of Quattro- and Cinquecento artifacts with representational contents. Such interdisciplinary studies are more easily conducted when we approach the subject through narrowly defined questions, such as Cinquecento practices of pricking and ruling underdrawings and pages. I hope that this study contributes to a historiographical reconsideration of *all’antica* sketchbooks, their procedures of making, and their materiality. A nuanced understanding of historical copybooks, model books, and journals is paramount for assessing the historical copying practices found in the Montreal codex and their meaning in context. By doing so, we can better understand historical workshop cultures, architectural knowledge-making and dissemination, and the nature of Cinquecento artisanal knowledge.

1. Gustina Scaglia, *Francesco di Giorgio: Checklist and History of Manuscripts and Drawings in Autographs and Copies from ca.1470 to 1687 and Renewed Copies (1764-1839)* (London and Toronto: Associated University Presses, 1992), 14. [↑](#endnote-ref-1)
2. “First your work is designed with a *plumbino* [leadpoint stylus], compass, and ruler. … In that way, therefore, wood and walls and stones and metals are drawn on in lines, we shall speak.” Mark Clarke, *Medieval Painters’ Materials and Techniques: The Montpellier* Liber diversarum arcium(London: Archetype Publications Lts., 2011), 97-99. [↑](#endnote-ref-2)
3. Pari Riahi, *Ars Et Ingenium: The Embodiment of Imagination in Francesco Di Giorgio Martini's Drawings* (Routledge Research in Architecture. London: Routledge, Taylor & Francis Group, 2015), 1-30. [↑](#endnote-ref-3)
4. Ibid., 12-15. [↑](#endnote-ref-4)
5. Gustina Scaglia and Mariano Taccola, *De machinis*: *The Engineering Treatise of 1449* (Wiesbaden, 1971) and Frank D. Prager, Gustina Scaglia, and Mariano Taccola, *Mariano Taccola and His Book De Ingeneis*. Cambridge, Massachusetts: MIT Press, 1972. [↑](#endnote-ref-5)
6. Pamela O. Long, “Power, Patronage, and the Authorship of Ars: From Mechanical Know-How to Mechanical Knowledge in the Last Scribal Age,” *Isis* 88, no. 1 (1997): 13. [↑](#endnote-ref-6)
7. Scaglia, *Francesco di Giorgio*, 15. Also Grendler reports that in 1531-43 at the Sienese *Studio* there were 39 professors: 4 for canon law, 14 or 15 from civil law, 7 or 8 for medicine, 6 for natural philosophy, 2 for metaphysics, 1 or 2 for astrology and mathematics, etc. Although the students who graduated from the *Studio* had degrees that circumscribed certain areas of knowledge, while residing at the *Casa della Sapienza* they could benefit from exposure to all the teachers. Paul F. Grendler, *The Universities of the Italian Renaissance* (Baltimore: Johns Hopkins University Press, 2002), 45-56. [↑](#endnote-ref-7)
8. Riahi, *Ars Et Ingenium*, 1-30. [↑](#endnote-ref-8)
9. For histories that contextualize the practice of copying sanctioned *exempla* as “ways of knowing” and claiming expertise, see Lorraine Daston, "Objectivity and Impartiality: Epistemic Virtues in the Humanities," *The Making of the Humanities: Volume III: The Modern Humanities*, edited by Rens Bod, Jaap Maat, and Thijs Weststeijn (Amsterdam: Amsterdam University Press, 2014), 27-42. See also Robert W. Scheller, *Exemplum: Model-Book Drawings and the Practice of Artistic Transmission in the Middle Ages*, translated by Michael Hoyle (Amsterdam: Amsterdam University Press, 1995) and John D. Lyons, *Exemplum: The Rhetoric of Example in Early Modern France and Italy* (Princeton: Princeton University Press, 2014). [↑](#endnote-ref-9)
10. “For example, the copy commissioned by Duke Alfonso of Aragon in 1492 with illustrations by none other than Fra Giocondo shows the direct links between the dissemination of Francesco’s work […] Moreover, such a link was neither an isolated nor an accidental occurrence–Sienese architects like Pietro Cataneo and Peruzzi, Leonardo, Luca Pacioli, Raphael, Serlio, Diego de Sagredo, Dosio, Ignatio Danti, even Barbaro and Scamozzi, are known to have owned drawings or (copies of) treatises [of di Giorgio’s], or at least been a party to their contents at one time or another.” Alina A. Payne, *The Architectural Treatise in the Italian Renaissance: Architectural Invention, Ornament, and Literary Culture* (Cambridge: Cambridge University Press, 1999), 90. [↑](#endnote-ref-10)
11. From here on, I refer to the *all’antica* sketchbook kept at the Canadian Centre for Architecture (DR1983: 0020:001-033) as the Montreal Codex. Over the years this compendium has been referred to differently. Cammy Brothers referred to it variously as the “Roman book,” “Montreal book,” or “CCA album.” James Ackerman referred to it as the “Canadian Centre sketchbook,” and Myra Nan Rosenfeld called it the “CCA modelbook.” Since Rosenfeld’s and Ackerman’s early publications, the Canadian Centre for Architecture has greatly enriched its collection and archives. I am afraid that simply saying “CCA album” is insufficient. To mark the sketchbook as an artefact in its entirety, I refer to the collection of unbound folios as the Montreal Codex. [↑](#endnote-ref-11)
12. Myra Nan Rosenfeld, “From Drawn to Printed Model Book: Jacques Androuet Du Cerceau and the Transmission of Ideas from Designer to Patron, Master Mason and Architect in the Renaissance,” *RACAR: revue d’art Canadienne/ Canadian Art Review*, vol.16, no.2 (1989), 138. [↑](#endnote-ref-12)
13. Ibid., 156-57. Baldassare’s collaboration with Sallustio is well established, as there are folios upon which they sketched and worked together preserved at the Uffizi. [↑](#endnote-ref-13)
14. Ann C. Huppert, *Becoming an Architect in Renaissance Italy: Art, Science, and the Career of Baldassarre Peruzzi* (New Haven and London: Yale University Press, 2015), 22-47. See also Fernando Loffredo and Ginette Vagenheim, eds. *Pirro Ligorio's Worlds: Antiquarianism, Classical Erudition and the Visual Arts in the Late Renaissance* (Leiden: Brill, 2019),75. And Vincenzo Fortunato Marchese, *Lives of the Most Eminent Painters, Sculptors & Architects of the Order of S. Dominic*. Translated by C. P Meehan (Dublin: James Duffy, 1852), 243. [↑](#endnote-ref-14)
15. Sebastiano Serlio and A. E. Santaniello, *The Book of Architecture, The fourth Booke* (New York: Benjamin Blom, 1970), f.1. [↑](#endnote-ref-15)
16. Payne, *The Architectural Treatise in the Italian Renaissance*, 116. [↑](#endnote-ref-16)
17. *Canadian Centre for Architecture: The First Five Years, 1979-1984* (Cambridge: Joint Center for Urban Studies of the Massachusetts Institute of Technology and Harvard University, 1964). According to the unpublished acquisition report at the CCA, the sketchbook was probably purchased from Ben Weinreb since the report is written on a paper that carries Weinreb’s letterhead. Weinreb was a London book and map dealer who specialized in rare books on architecture and topography. J. B. Bury, unpublished report, February 8, 1982, acquisition folder DR1982: 0020:001-033, Canadian Centre for Architecture, Montreal. However, during his consultation of Kraus’s collection, Rudolf Wittkower noted that Kraus retained one additional album, apart from the Mellon, with sixteenth century architectural drawings, which came from the same source as the Mellon. This other sketchbook could have been the CCA’s book. It might have been in the possession of H.P. Kraus at some point, perhaps simultaneously to his ownership of the Mellon Codex, now kept at the Morgan Library and Museum. Rudolf Wittkower, “Idea and Image: Studies in the Italian Renaissance.” In *The Collected Essays of Rudolf Wittkower.* (London: Thames and Hudson, 1978), 91. [↑](#endnote-ref-17)
18. James S. Ackerman, “The Tuscan/Rustic Order: A Study in the Metaphorical Language of Architecture,” *Journal of the Society of Architectural Historians* 42, no. 1 (1983): 23. The image of folio 001, which Ackerman included in his article, represents the sketchbook in a previous state, in which the folio with the columns from San Nicola in Carcere in Rome remains bound to the rest of the sketchbook. Thus, I suspect that the three gatherings were unbound for the 1898 exhibition at the CCA titled “Architecture and Its Image.” The folio bearing the fragment from San Nicola in Carcere in Rome was exhibited as a single folio in this exhibition. [↑](#endnote-ref-19)
19. Cammy Brothers, “Drawing in the Void: The Space Between the Sketchbook and the Treatise,” *Some Degree of Happiness: Studi di Storia dell’Architettura in Onori di Howard Burns*, edited by Maria Beltramini and Caroline Elam (Pisa: Scuola Normale Superiore, 2010), 94-97. [↑](#endnote-ref-20)
20. J. B. Bury, unpublished report, DR1982: 0020:001-033. The overlap of subject matter between the Montreal Codex and Sallustio’s sheets was previously noticed by Bury and noted in his report of the sketchbook. Since then, scholars including Ackerman and Brothers have pointed out the similarity. [↑](#endnote-ref-21)
21. Julia Miller, *Books Will Speak Plain: A Handbook for Identifying and Describing Historical Binding* (Ann Arbor: Legacy Press, 2010), 20. [↑](#endnote-ref-22)
22. Thea Burns, report of examination, 12 June 1997, acquisition folder of DR1982: 0020:001-033, Canadian Centre for Architecture, Montreal. Also, Michèle Valerie Cloonan, *Early Bindings in Paper: A Brief History of European Hand-Made Paper-Covered Books with a Multilingual Glossary* (Boston, MA: G.K. Hall, 1991), 81. [↑](#endnote-ref-23)
23. Margarita Fernández Gómez*, Codex Escurialensis 28-II-12: libro de dibujos o antigüedades*(Madrid: Patrimonio Nacional, Consejo General de la Arquitecture Técnica de España, 2000), 44-50. The original binding of the Escurialensis is explained through the description that appears in the wills of the Marques de Zenete and Diego Hurtado de Mendoza (1503-1575). [↑](#endnote-ref-24)
24. Phyllis Pray Bober, *Drawings After the Antique by Amico Aspertini: Sketchbooks in the British Museum* (London: The Warburg Institute, 1957). [↑](#endnote-ref-25)
25. Ackerman, “The Tuscan/Rustic Order,” 15-34. Ackerman described Baldassare Peruzzi’s *of San Nicola in Carcere* as a rare exploration of the Tuscan order (536 A, Uffizi). [↑](#endnote-ref-26)
26. The size variation of the Montreal Codex’s bifolios are so slight, they can be expressed in millimeters. In this study, these minimal format differences are not distinguished. A very similar bifolio, with the same watermark, kept at the Corpus Chartarum Italicarum (CCI) –an archive of papers from the thirteenth century created at the Royal Institute of Book Pathology in Rome– measures 32.8-33.2 x 43.2-43.4 cm. This demonstrates how sheets that might have been of the same size (even from the same mold and deckle) were variously cut down to fit the formats of diverse books and notebooks. Variations of standard paper sizes existed and were labeled to recognize their “parent” formats. Commercial references of format variations included: *imperialino, realino, doppio, mezzoreale, mezzanella*, etc. Sylvia Rodgers Albro, *Fabriano: City of Medieval and Renaissance Papermaking* (New Castle: Oak Knoll Press, 2016), 83-85. See also Richard L. Hills, “A Technical Revolution in Papermaking, 1250-1350,” *Looking at Paper: Evidence & Interpretation*, edited by John Slavin, Linda Sutherland, John O’Neill, Margaret Haupt, and Janet Cowan (Ottawa: Canadian Conservation Institute, 2001), 105-111. [↑](#endnote-ref-27)
27. Mauro Mussolin, “Michelangelo e i disegni di figura,” *Michelangelo Als Zeichner*, edited by Claudia Echinger-Maurach, Achim Gnann, and Joachim Poeschke (Münster: Rhema, 2013), 145-165. [↑](#endnote-ref-28)
28. Marco Frascari, *Eleven Exercises in the Art of Architectural Drawing: Slow Food for the Architect's Imagination* (Taylor & Francis Group, 2011), 10-16*.* Here the underdrawings themselves (including the draughting media and support) are the “layered matter” which coincides with the layered gestures of the draughtsperson. Frascari’s term *facture* might be helpful when thinking of drawing marks in the sense of deposits of gestures. [↑](#endnote-ref-29)
29. Michelle P. Brown, *Understanding Illuminated Manuscripts: A Guide to Technical Terms* (Los Angeles: The J. Paul Getty Museum, 2018), 87, 95-96. [↑](#endnote-ref-30)
30. By “referential scale” I refer to a scale that represents scaling down the drawing of the fragment in reference to the size of the page. These scales were not uniform across all the pages and architecture. Apart from making sure the drawing was tailored to the page, the “referential scale” also provided the onlooker with the proportional relationship of the part to the whole of the building without annotations. Or, in Serlio’s words: “so that the sensible reader can find all their proportions with a pair of compasses in hand.” Noam Andrews, “The Architectural Gesture,” *Log*, no. 33 (2015): 148. [↑](#endnote-ref-31)
31. Rodney M. Thomson, Nigel Morgan, Michael Gullick, and Nicholas Hadgraft, “Technology of production of the manuscript book,” *The Cambridge History of the Book: 1100-1400*, edited by Nigel Morgan and Rodney M. Thomson (Cambridge: Cambridge University Press, 2008). Also M. B. Parkes, “Layout and Presentation of the Text,” Ibid. On architectural connections and how the Gothic cathedral may have inspired the ruling of the High Gothic manuscripts, see Albert Derolez, *The Palaeography of Gothic Manuscript Books: From the Twelfth to the Early Sixteenth Century* (Cambridge: Cambridge University Press, 2003). For the use of manuscript text ruling for the draughting of architectural illuminations see Donal Byrne, “Manuscript Ruling and Pictorial Design in the Work of the Limbourgs, the Bedford Master, and the Boucicaut Master,” *The Art Bulletin* 66, no. 1 (1984): 118–36. [↑](#endnote-ref-32)
32. Matti Peikola, “Guidelines for Consumption: Scribal Ruling Patterns and Designing the *Mise-en-page* in Later Medieval England,” *Manuscripts and Printed Books in Europe, 1350-1550: Packaging, Presentation and Consumption*, edited by Emma Cayley and Susan Powell (Liverpool: Liverpool University Press, 2013), 14-31. [↑](#endnote-ref-33)
33. Ibid., 31. [↑](#endnote-ref-34)
34. Leslie Webber Jones, “Where Are the Prickings?” *Transactions and Proceedings of the American Philological Association* 75 (1944), 75. [↑](#endnote-ref-35)
35. Carmen C. Bambach, *Drawing and Painting in the Italian Renaissance Workshop: Theory and Practice, 1300-1600* (Cambridge and New York: Cambridge University Press, 1999). [↑](#endnote-ref-36)
36. Abigail Shinn and Angus Vine, “Introduction: Theorizing Copiousness,” *Renaissance Studies* 28, no. 2 (2014): 167-82. [↑](#endnote-ref-37)
37. Pamela H. Smith and Benjamin Schmidt, eds., *Making Knowledge in Early Modern Europe: Practices, Objects, and Texts, 1400-1800* (Chicago: University of Chicago Press, 2007). See also Pamela H. Smith, Amy R. W Meyers, and Harold J Cook, Eds., *Ways of Making and Knowing: The Material Culture of Empirical Knowledge* (New York City: Bard Graduate Center, 2017). Pamela O. Long, *Openness, Secrecy, Authorship: Technical Arts and the Culture of Knowledge from Antiquity to the Renaissance* (Baltimore: Johns Hopkins University Press, 2004), 133-142. [↑](#endnote-ref-38)
38. Francis Ames-Lewis, *Drawing in Early Renaissance Italy* (New Haven: Yale University Press, 1999), 53-59. See also Annamaria Petrioli Tofani, “I Materiali e le Tecniche,” *Restauro e conservazione delle opere d’arte su carta* (Firenze: Leo S. Olschki Editore, 1981). [↑](#endnote-ref-39)
39. Serlio and Santaniello, *The Book of Architecture,* (New York: Benjamin Blom, 1970). [↑](#endnote-ref-40)
40. Ibid.*, The fourth Booke, the sixt Chapter*, f.16, 17, 18. [↑](#endnote-ref-41)
41. Ibid.*, The third Booke, the fourth Chapter*, f.34, 35, 36. [↑](#endnote-ref-42)
42. Mussolin, “Michelangelo,” 145-165. [↑](#endnote-ref-44)
43. Charles-Moïse Briquet, Les Filigranes*: Dictionnaire Historique Des Marques Du Papier Dès Leur Apparition Vers 1282 En 1600,* Vol.2 (Paris: Alphonse Picard, 1907), 377. [↑](#endnote-ref-45)
44. Burns, report of examination, DR1982: 0020:001-033. [↑](#endnote-ref-46)
45. Ibid. [↑](#endnote-ref-47)
46. Josef Ploder, “La figura di Heinrich von Geymüller (1839-1909), studioso e collezionista, nell ricerca storica,” *Bramante e gli Altri: Storia di Tre Codici e di un Collezionista*, edited by Josef Ploder (Firenze: Leo S. Olschki editore, 2006), 54-57. [↑](#endnote-ref-48)
47. Gianni Baldini, "Di Antonio Labacco Vercellese, Architetto Romano Del Secolo XVI," *Mitteilungen Des Kunsthistorischen Institutes in Florenz* 37, no. 2/3 (1993): 338. [↑](#endnote-ref-49)
48. Burns, report of examination, DR1982: 0020:001-033. [↑](#endnote-ref-50)
49. Desley Luscombe, “The Architect and the Representation of Architecture: Sebastiano Serlio's Frontispiece to *Il ferzo libro*,” *Architectural Theory Review*, vol. 10, n.2, (2005): 34-53. See also Desley Luscombe and Jeffrey Mueller, “The Politics of Representation in Three Architectural Frontispieces: Alberti, Scamozzi and De L’Orme,” *Architectural Theory Review*, vol. 1, n. 1 (1996): 2-19. [↑](#endnote-ref-51)
50. Antonio Labacco, *Libro D'antonio Labacco Appartenente a L'architettvra Nel Qval Si Figvrano Alcvne Notabili Antiqvita Di Roma* (Roma, 1691). [↑](#endnote-ref-52)
51. On the pages of the Montreal Codex, red chalk is found on the folios 009, 010, 012, 015, 017, 031, 033. It may have been present on additional folios given that if red chalk was not “fastened” to the paper with an adhesive it would have faded away. Red chalk was also considered a powerful medium for processes that required transformation and generation of ideas and things. Pamela H. Smith, “Following Itineraries of Matter in the Early Modern World,” *Cultures in Motion*, edited by Daniel T. Rodgers, Bhavani Raman, and Helmut Reimitz (New Jersey: Princeton University Press, 2014), 112. [↑](#endnote-ref-53)
52. Serlio and Santaniello, *The Book of Architecture, The fourth Booke, the sixt Chapter*, f.16. [↑](#endnote-ref-54)
53. Deborah La Camera, “Crystal Formations Within Iron Gall Ink: Observations and Analysis,” *Journal of the American Institute for Conservation* 46, no. 2 (2007), 167-69. [↑](#endnote-ref-55)
54. Charles de Tolnay, *History and Technique of Old Master Drawings: A Handbook*. (New York: Hacker Art Books, 1972). Regarding the descriptions of iron gall inks when they appear in different colors, various scholars have opted to use different terminologies. For instance, Charles de Tolnay suggests describing the drawings as they appear to the historian. Hugo Chapman has generally denominated iron gall ink as “brown ink.” Other scholars, such as Giovanni Verri and Catherine Higgitt, have resolved to use the term *iron gall ink* as the most suitable. Given that this study relies on the sensible and physical appearance of historical artifact, I follow Chapman’s suggestion and describe the inks (and the rest of the media and the techniques) as they appear. Janet Ambers, Catherine Higgitt and David Saunders, ed. *Italian Renaissance Drawings: Technical Examination and Analysis*. London: Archetype Publication, 2010. [↑](#endnote-ref-56)
55. Burns, report of examination, DR1982: 0020:001-033. [↑](#endnote-ref-57)
56. For instance, a circular plan found in the Barberini Codex at the Vatican Library exhibits similar compass work to construct the plan geometry but does not mark any of the nodes where lines intersect. Giuliano da Sangallo appears to have used frugal underdrawings to position his ink lines, not bothering to return and review the expanded guidelines. Giuliano da Sangallo, *Il libro di Giuliano da Sangallo: Codice vaticano Barberiniano latino 4424*, introduction by Christiano Huelsen (Vatican City: Biblioteca apostolica vaticana, 1984), 0044r. [↑](#endnote-ref-58)
57. Brothers, “Drawing in the Void,” 94-103. [↑](#endnote-ref-59)
58. Jones, “Where Are the Prickings?” 71-86. [↑](#endnote-ref-60)
59. [↑](#endnote-ref-61)
60. Stephen Parcell, “Architecture as an Art of Disegno.” In *Four Historical Definitions of Architecture* (McGill-Queen's University Press, 2012), 105-21. [↑](#endnote-ref-62)
61. Jonathan Foote, "Tracing Michelangelo’s *Modani* at San Lorenzo," *Mitteilungen Des Kunsthistorischen Institutes in Florenz* 61, no. 1 (2019): 45-74. See also Michael Hirst, *Michelangelo and his Drawings* (New Haven and London: Yale University Press, 1988). Conversely, on copying see Ian Campbell and Arnold Nesselrath, “The Codex Stosch: Surveys of Ancient Buildings by Giovanni Battista da Sangallo,” *Pegasus: Berliner Beiträge zum Nachleben der Antike* 8 (2006): 24. Here the authors note that the plan and detail of the Janus Quadrifrons (UA 1046r) by Antonio da Sangallo the Younger, are so close to fol. 2r of the Codex that they “might have been copied by superimposing the sheets.” [↑](#endnote-ref-63)
62. For a catalogue of all of Dosio’s drawings at the Uffizi see Franco Borsi, Cristina Acidini, Fiammetta Mannu Pisani, and Gabriele Morolli, ed., *Giovanni Antonio Dosio: Roma Antica e i disegno di architettura agli Uffizi* (Roma: Officina Edizioni, 1976). [↑](#endnote-ref-64)
63. [↑](#endnote-ref-65)
64. [↑](#endnote-ref-66)
65. Rosenfeld, “From Drawn to Printed Model Book,” 138. [↑](#endnote-ref-67)
66. Brothers, “Drawing in the Void,” 102. [↑](#endnote-ref-68)
67. “In another case, that of the Temple of Minerva Medica, the Montreal author appears to have relied on an indirect copy of Giuliano da Sangallo’s drawing in the Codex Coner – but he may have known

Giuliano’s version as well. The author adopted the name («the temple of Caesar») given by Giuliano and then Volpaia, as well as the measurement system shared by both drawings. The latter is especially notable considering that most of the measurements in the Montreal book are in piedi, but this is in «braza».” Brothers, “Drawing in the Void,” 100. [↑](#endnote-ref-69)
68. Huppert, *Becoming an Architect*, 156-57. [↑](#endnote-ref-70)
69. “Serlio had arrived in Venice by 1st April 1528, when he made his will. The evidence of the document given here suggests that he must have brought many of his drawings of Roman antiquities to Venice at this time. These drawings had been made in the Peruzzi circle in Rome (where Serlio studied under Peruzzi), and some must have been copied after drawings by his master. Hence, almost eight years before the death of Peruzzi on 6th January 1536, Serlio was already planning to print some of this graphic material himself.” Deborah Howard, “Sebastiano Serlio's Venetian Copyrights,” *The Burlington Magazine* 115, no. 845 (1973), 512-16. [↑](#endnote-ref-71)
70. Huppert, *Becoming an Architect*, 10-15. Huppert has argued that Peruzzi’s family ties that seem to have occupied an important role in his professional life has been greatly overlooked. [↑](#endnote-ref-72)
71. Payne, *The Architectural Treatise in the Italian Renaissance*, 139. [↑](#endnote-ref-73)
72. Albertus Magnus, Irven Michael Resnick, and Kenneth Kitchell. *On Animals: A Medieval Summa Zoologica* (Baltimore: Johns Hopkins University Press, 1999), xix. [↑](#endnote-ref-74)
73. Scaglia, *Francesco di Giorgio*, 14. [↑](#endnote-ref-75)
74. Ibid. [↑](#endnote-ref-76)
75. Historians of music, such as John Haines, have argued that the ruling of medieval manuscripts is the clear predecessor of the structure and appearance of the modern musical score. John Haines, “The Origins of the Musical Staff,” The *Musical Quarterly* 91, (2008), 330. [↑](#endnote-ref-77)