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Chapter 02 - From Scroll to Codex: New Technology and New Opportunities

Anna O. Funk

Western Oregon University, afunk12@wou.edu

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From Scroll to Codex: New Technology and New Opportunities

-Anna O. Funk-

One of the most important disruptions in the history of the book was the invention of the book itself, which was originally called the “codex.” Of course, the definition of “book” is broader than the object we are familiar with today, because clay tablets, bamboo, and papyrus scrolls were essentially books, too, just in unfamiliar forms. When the codex came along, it was a novel form for recording knowledge and information—a disruptive technology. As we discussed in the introduction, a disruptive technology opens a new market and gradually overtakes an existing one, which is just what happened with the codex in the first centuries A.D. In this chapter, we will see that the book materialized primarily as a way for the early Christians to record their scriptures, and it gradually became the accepted form for preserving texts throughout Europe. Book illustration also changed dramatically because of the opportunities brought by the new technology, and monastic libraries sprang up as centers where books were copied, studied, and preserved during the Middle Ages.

The Scroll versus the Codex

The word “codex” is Latin and means “the stem of a tree,” and also refers to a board that was used for keeping accounts. It describes any written work in the form of books, which originally were pages made of papyrus or parchment sewn together at one side and bound in wood or leather covers^{1,2}. Before this, texts were usually contained in long scrolls that were rolled up when not being read. Scrolls, although more compact and manageable than bulky clay tablets, were quite cumbersome to handle. In order to reread a passage, a scholar had to rewind the scroll until he found the place he wanted. This would be nearly impossible, since there were no paragraph breaks or capital letters—let alone

Parchment pages, which were made from dried and scraped animal hides, were more durable and sturdy than papyrus. The most prized parchment was vellum, made from high-quality calfskin³.

page numbers—to help guide the reader. Also, a scroll could not contain a lengthy text, so to collect manuscripts one needed a lot of storage space. Usually, scrolls were kept in shelves divided into little compartments, like cubby holes.

The codex solved some of these problems. One could much more easily flip back and forth in the text, and pages saved space since they could have writing on both sides, unlike a scroll. This way, a manuscript could be contained in one volume instead of several scrolls, and one needed less storage space. The codex may also have evolved from notebooks used in the first centuries A.D., which were easier to carry around than unwieldy scrolls. People were very familiar with these notebooks. They used them for jotting things down, keeping accounts, and making first drafts of manuscripts, much like we use spiral-bound notebooks today⁴.

However, not all evidence suggests that the invention of the codex was due to all the problems associated with earlier technologies. Although codices were probably slightly cheaper to produce than scrolls, they were not much easier to read, because they still contained no paragraph breaks or punctuation. Besides this, the codex could not originally accommodate extremely lengthy texts like books can today. In fact, early examples of these books do not generally show a desire to economize space as we might expect⁵. So, why did the codex gain such popularity? It turns out that the development of the codex had less to do with practicality and more to do with the people who began using it: the early Christians.

At the time that early Christians were compiling their scriptures, Jewish writings included the Old Testament of the Bible. Around 200 A.D., Jewish rabbis collected traditional oral laws and sayings into a text called "Mishnah." It quickly became an important part of Jewish theology and

The Codex and the Early Christians

The early Christians were among the first to adopt the codex for their religious texts, and they played a pivotal role in perfecting its technology. We can see from surviving manuscripts that they deliberately chose to record the Gospels and other writings in book form. This may have been partly to differentiate them from first century Jewish texts, which were always recorded

in scrolls⁴. Christianity represents the fulfillment of Judaic tradition, proclaiming the arrival of the Savior and promising eternal life to all who believe in Him. Thus, early Christians would certainly have wanted to set the teachings of Christ and the apostles apart from Judaism. Using the new technology of the codex enabled Christians—and potential converts—to experience both a material and a spiritual transformation in the writings of their faith.

Early Christianity also involved a great deal of correspondence. In the first century A.D., Paul and several other apostles, who were the first evangelists, wrote many letters to various churches all around the Mediterranean. It is quite possible that these letters were copied and eventually bound into notebooks. The techniques they used were similar to those used to make codices, and the method easily transferred to more formal writings⁸. Christians had very good reasons for using the codex, and it quickly became the accepted technology for their texts, before Jewish and secular writers fully embraced it. Although a few codices with subjects like astronomy and medicine exist from the first century, the vast majority are Christian texts⁵.

One of these early codices is called the *Codex Sinaiticus*. This manuscript is one of the first codices to contain the entire Bible, which shows us that Christians had been perfecting the process of book-making and were able to make quite large books by the mid fourth century. Scholars debate where and exactly when the *Codex Sinaiticus* was written, but some think it was commissioned by Constantine the Great⁹. He was the first Christian emperor of Rome, and we know he ordered fifty Bibles to be copied in about 330 A.D.⁴. The Bible is written in Greek on parchment, and scholars have judged by the different handwriting that four scribes helped copy it. These scribes, as well as

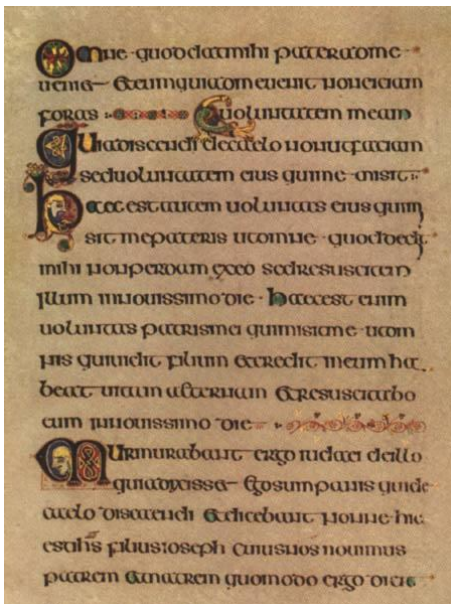


The Lord's Prayer in the *Codex Sinaiticus*¹

others up until the twelfth century, extensively corrected errors; books were not unchangeable in those early days^{10,11}.

Slightly later, Constantius II, who reigned from 337 to 361, appointed a philosopher named Themistius to undertake the rather daunting task of transferring writings from ancient scrolls to modern codices⁹. These texts were not Christian; he unearthed and preserved the works of philosophers and the literature of the ancient poets and playwrights. Clearly, the codex had become accepted as the preferred technology for recording information of all kinds. Eventual acceptance is one of the aspects necessary for technology to be considered disruptive, and the history of the book demonstrates this during the first centuries A.D.

Illumination



A page from the *Book of Kells*, an illuminated Bible from the ninth century²

Besides giving Christians a way to set their scriptures apart from Judaic texts and providing greater economy of space, the codex offered new opportunities for the illustration of manuscripts. In the scroll, illustrations had taken a subordinate role in the manuscript, usually in the form of simple drawings^{12,13}. Now, people began to see the opportunity to enlarge illustrations and separate them from the text. Early books like the *Codex Sinaiticus* were not extensively illustrated, but soon, art came to define the texts of the Middle Ages. We call this art of book illustration “illumination,” because the designs include opulent gold leaf and bright

“Gold leaf” is really made of extremely thin flakes of gold that are adhered to the page with glue or gesso. The latter is a type of paint that allows the gold leaf to be raised off the page, creating a brilliant three-dimensional effect¹⁴.

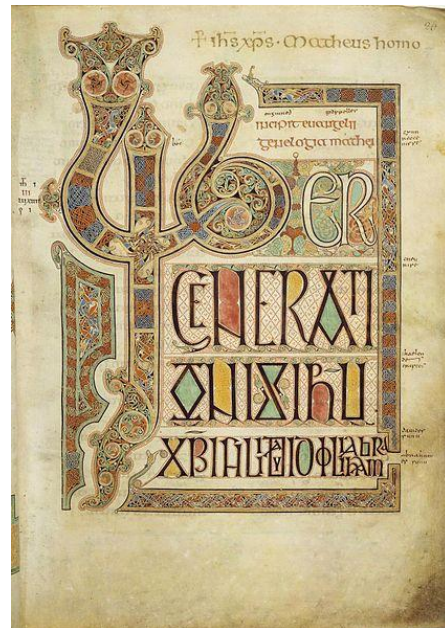
colors that “light up” the page. Sometimes illumination is confined to borders that surround the text, or embellished letters at the beginning of important passages (previous page), but sometimes a design fills a whole page. Some images are abstract, while others depict scenes from the Bible. In others,

dragons and birds weave among intricate patterns. Most noticeable, however, is the gold and silver leaf that embellishes the brightly painted designs. The effect is a dazzling display that complements the manuscript and attests to the artistic talent of the monks, scribes, and illuminators who undertook the work of making these books. Thus, we can see that the disruptive invention of the codex greatly affected illustration as well as manuscript format.

The *Lindisfarne Gospels* are a good example of how elaborate illuminations had become by the eighth century. The book contains four books from the Bible: the gospels according to Matthew, Mark, Luke, and John. They are the first books of the New Testament, and each one tells the story of Christ's life, death, and resurrection. The *Lindisfarne Gospels* were probably written and illuminated by Eadfrith, who was bishop of the monastery at Lindisfarne in northeastern England in the early to mid 700s. Many scholars consider the codex to be "one of the world's most famous and beautiful books¹⁵." The bishop used fine vellum, gold leaf, and an unusually large range of pigments, and the book's cover is decorated with precious stones. Full-page designs of crosses and each of the four gospel writers enhance the text. The artist-scribe wove intricate designs together and used lines of red dots to accentuate curves and letters. But the book's illuminations were never finished. Some pages only have unfinished sketches, so we must assume that Eadfrith became ill or died before he could complete his great mission¹⁵.

Monks and Scribes

The people responsible for creating the magnificent books of the Middle Ages were, like Eadfrith, usually monks, who were also called scribes. There



Folio 27r from the *Lindisfarne Gospels*³

The *Lindisfarne Gospels* also play another role in the book's disruptive history. In the mid tenth century, at a time when most books were in Latin, the manuscript was translated into Old English between the lines of Latin text¹⁵. This foreshadowed the surge of Bible translations to the vernacular six hundred years later which made the Bible more accessible to common people.

were secular copyists at the time as well, but most of these scribes were religious men¹⁶. They lived in remote monasteries, far from the temptations of the world, and spent their time in prayer, work, and study. The *Rule of Saint Benedict*, written by a famous abbot, encouraged monks to read for three hours each day. Because of this, books—and therefore the creation of more books—were an important part of life. Reading the scriptures and other texts by the church fathers helped the monks learn God's Word so they could become more righteous and prayerful¹⁷.

These monks usually copied manuscripts in a special room in the monastery set aside for the purpose: the scriptorium. Often, each monk sat at his desk in silence with a manuscript before him, painstakingly copying the words onto parchment or vellum, but sometimes, one monk read aloud while several others copied the text at the same time. This way, they produced several copies of the same book. The process in either case was laborious and prone to error, although scribes were warned to be very careful not to alter a word or the meaning of a passage. Even with proof-reading, though, mistakes were sometimes overlooked. Copying manuscripts was quite time-intensive, and the complex illuminations certainly added to the labor; a Bible could take one monk fifty years to complete¹⁶. However, these beautiful books demonstrate how the disruptive technology of the codex provided new opportunities for artistic creativity as well as a novel format for the text.

Monastic Libraries

The creation of monastic libraries was another disruptive innovation in the history of the book. Although they were dwarfed in comparison to the great libraries of antiquity like the Ancient Library of Alexandria in Egypt, these libraries became important centers of learning in Medieval Europe¹⁸. By the fourth century, the public libraries of the classical past were in decline, because early Christians were generally very wary of classical philosophy, and they sometimes even burned pagan books¹⁹. Ironically, the monastic library came to fill the void of learning left from the neglect and avoidance of classic literature

when Christianity first took root. This made books more accessible to scholars and the clergy, and provided opportunities to learn about the scriptures and classic writings of the ancient past.

These libraries could be found within monasteries throughout Europe beginning in the 400s, and they contained books on a wide variety of subjects. Of course, the most important and numerous writings were the scriptures—either portions or the entirety of the Bible—but libraries also preserved the writings of the church fathers, rhetoric, medicine, the classics, and even poetry^{18,20}. Some clergy still vehemently rejected the pagan writings of the past, but others studied and borrowed from the classics and encouraged their collection. Actually, monks are to be thanked for preserving the classical texts of antiquity, because they may otherwise have been lost¹⁷. Thus, the Medieval Period, far from being “the Dark Ages,” was a time when knowledge and learning was greatly valued, especially by Christians within the context of monasteries.

After the advent of the monastic library, as their collections became larger, monks began cataloging the books. These catalogs were usually just inventories listing the works in the library, and they were not very helpful by modern standards. Although sometimes catalogs were organized by subject or author, many had no organization at all, and provided only the name of the first or most important work in a particular book. We always think of a book as containing one work by one author, but in medieval times, writings—even by different authors—were sometimes put together into one codex¹⁸. Of course, listing only one work in a volume created incomplete records¹⁷. Besides this, a library catalog did not give information about where a scholar could find a certain book; it only showed him that the monastery owned it, and then he had to find it himself. However, these catalogs were still an important step in the disruptive innovation of the library.

Monks were not the only people to benefit from the renewed interest in learning. During the Carolingian era, education became increasingly available

to the laity because of Charlemagne's desire to revive the learning and knowledge of ancient Rome among his subjects. Libraries contributed to this immensely, since they held the information that was becoming so important¹⁹. Scholars travelled from monastery to monastery seeking books on every imaginable subject, and books travelled, too. Manuscripts were often copied and taken to other libraries, and pilgrims who visited Rome brought books back to western libraries, which quickly spread both religious and secular writings. The library had become an institution that was an integral part of medieval culture^{3,19}. Of course, all this learning took place in a Christian atmosphere; the Church essentially possessed and controlled all knowledge in Europe during the Middle Ages, but libraries allowed access to it, fostered education, and protected the valuable works of the past¹⁹.

The Disruptive Codex

Now we can see how disruptive the invention of the codex was, and what an amazing impact it had on the books and the culture of the early Middle Ages. It transformed the way we record information, using a new format and allowing larger and more elaborate decoration of the text. Its popularity first rose among Christians desiring to differentiate their scriptures from Judaic texts and looking for a way to transfer letters to a more permanent and convenient form. The technology, which was completely different from the scroll, didn't become fully accepted by others until Christians had already begun using it.

As for illustration, the codex gave monks the opportunity to begin creating beautiful and extremely elaborate designs that covered entire pages and illuminated manuscripts like the *Lindisfarne Gospels*. The monasteries where these monks lived soon began to collect books in monastic libraries, which preserved ancient classics, encouraged education, and provided literature to an increasing number of people. These disruptive innovations have become a significant part of our lives today, even though they have continued to change. We still read books in the form of the codex, many volumes are lavishly illustrated, and the library remains a central part of our culture. The invention of

the codex was a momentous step in the book's disruptive history that reminds us of how the present is always shaped by the past.

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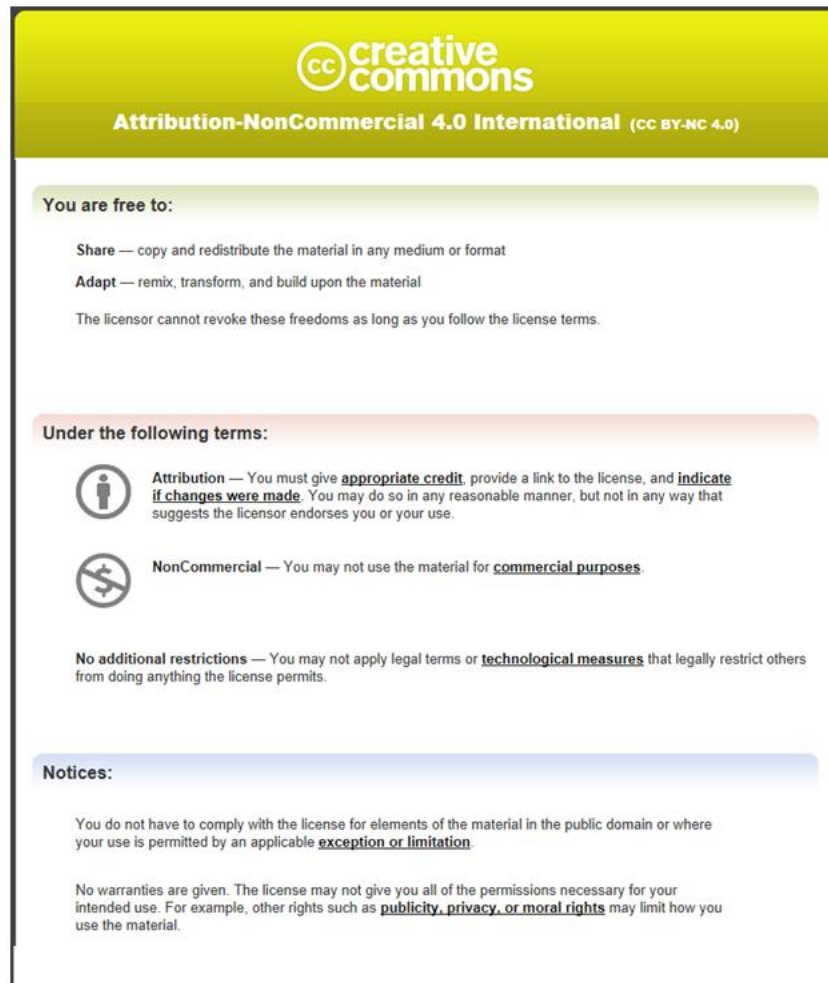
Images

1. People, Lord's Prayer in the Codex Sinaiticus, public domain, (4th century).
2. Dsmdgold, Page from the Book of Kells, public domain, (2004).
3. Eadfrith of Lindisfarne (presumed), Folio 27r from the Lindisfarne Gospels, public domain, (8th century).

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