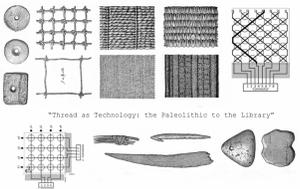


<p>Thread Librarian¹</p>	<p>Hello all, thank you so much for visiting Thread Library. I'm our director, India Johnson. Before we start the lecture, I just wanted to greet you all, give you a feel for our collections, and tell you a little about our mission.</p> <p>Thread Library is a collection of donated threads. Each thread is cataloged as if it is a book. We believe that a book is a compression of information.</p> <p>At Thread Library, we envision information as fragmentary, decorative, material, tangible, and tacit.</p> <p>(change slide)</p> <p>We organize our threads by color, size, and sentimental value. I'll turn the time over to our Outreach Librarian for the rest of tonight's event, but after the lecture, I'm available for tours of the collection. Thank you so much for coming.</p>	
<p>Thread Librarian²</p>	<p>Welcome! I'm India Johnson, the Outreach & Engagement librarian here at Thread Library. We'd like to begin by thanking our host library, the Visual Studies Workshop research collection, and the director of the collection, Jessica Johnston. We're thrilled that the whole staff from both libraries could be here with us tonight. Our distinguished guest this evening is Thread Library's Curator of Thread, Cord, and Yarn. Her talk is titled: "Thread as Technology: the Paleolithic to the Library." Following her remarks, we will have a series of short presentations from other staff members, and then a Q & A. Our library assistant, India Johnson, will now introduce our guest speaker.</p>	
<p>Thread Librarian³</p>	<p>In 2019, she assumed the Thread Library curatorship after a distinguished career in libraries and special collections. Before coming to Thread Library, she was the curator of Textiles at the Rochester Institute of Thread. A textile scientist by training, she is the author of a forthcoming publication about our collections, entitled "Interview with a Thread." Under her leadership, in 2021 Thread Library launched an ambitious digitization initiative to provide the public with greater access to our holdings online. Without further ado, please join me in welcoming our Curator.</p>	

Thread Librarian⁴

Hello, I'm India Johnson, curator of Thread Library. I'm so honored to be here tonight as the visiting lecturer and to talk to you about our collection, which is part of a long tradition of thread manufacture and use. Although most of our holdings are from the 21st century, this history really contextualizes our contemporary items. (changes slide)

The oldest needle we know of was found in a cave in Europe, specifically the Republic of Georgia.
About 3" long
Bone
It is roughly 50,000 years old.
The needle predates our species



Oldest known thread
6 mm long
40-50,000 years old
Excavated from a cave in France
Would have been spun by Neanderthals



This ancient thread's structure is three ply. This means three individual strands of fiber were twisted in one direction, and then those three strands were grouped and all three were twisted together in the opposite direction. That second twist, known as plying, ensures the thread's strength.

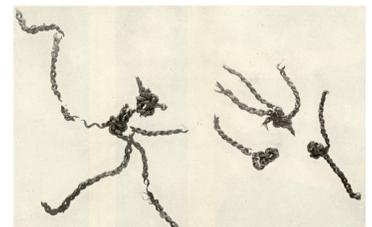


This 50,000-year old 3-ply thread indicates that Neanderthals understood "counting, sets, & patterns."

This thread is made of material harvested from the inner bark of a pine tree, which is called bast fiber. Please see collection item 25 for an example of cordage made from bast fibers.
It's possible this thread formed a handle to grip a stone tool, or was part of a net bag that stored the tool.



<https://en.wikipedia.org/wiki/Twine>
<https://www.npr.org/templates/story/story.php?storyId=112726804>
In fact, many of the oldest textiles were baskets, nets, and rope. The archeologist Ofer Bar-Yosef, who excavated some of the earliest linen fibers, claims that ropes and baskets were "items that were mainly used for domestic activities." But these domestic objects had major implications outside the home. String increased the mobility of an entire hunter-gatherer society. The archaeologist Elizabeth Barber calls this the "string revolution."



She argues that string “totally revolutionized what they could do ... On a very simple basis, think of the fact you can tie things up in packages so you can carry more. You can put out nets and snares to catch more game so you can eat better.”

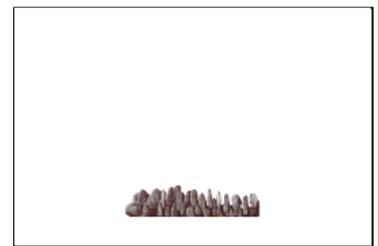
Barber has further argued that no evidence exists for a linear progression from functional to decorative textiles. Thread has always been a beautiful technology. For example, these 30,000 year old flax fragments are dyed turquoise and pink.



Overall, few ancient threads survive. The aforementioned threads are the exception, not the rule. Initially, textiles would have been more common at archeological sites than stone and bone. Over time, they decay. This skews our understanding of “tools” and “technology”: thread, a powerful tool of prehistory, becomes



invisible.



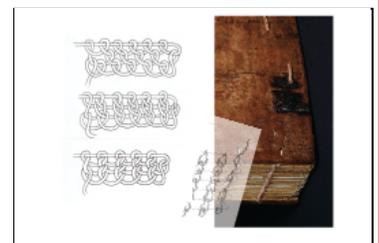
Some archeologists consider the use of language, and the use of thread, to be equally complex cognitive tasks. Like making a textile from thread, language “demonstrates an infinite use of finite means.” Written language developed independently in the regions of the world we know today as the Middle East, Central and South America, and Asia. Although clay, wax, and stone were probably the first supports for writing, codex books emerged in all three regions.



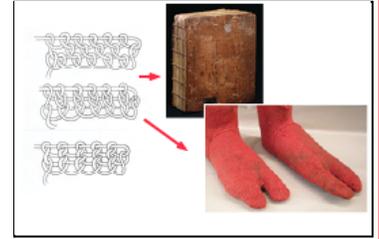
The codex is the format we think of today when we hear the word ‘book’--a codex has pages bound along one edge, usually with thread. Some of the oldest codex books that survive date from the 7th or 8th centuries. They were made in monasteries in Africa, specifically Ethiopia. The artisans who made these books transferred existing textile techniques from socks, sandals, and tunics to sew books.



For example, a technique for constructing textiles by looping thread on a single needle was adapted for sewing early codex books.



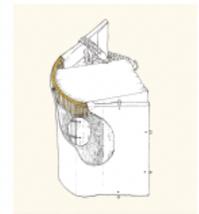
This technique preceded knitting. It was used to make socks like these, which come from Africa, specifically Egypt, in the 4-5th centuries.



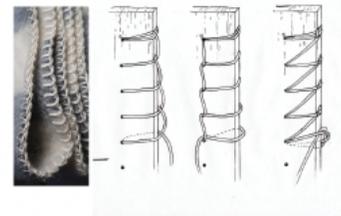
Collection item 12 demonstrates the initial or cast-on stitches for constructing clothing with this method.



One family of techniques for sewing books originated as a way to finish hand-woven cloth, so it didn't unravel. These stitches were adapted to consolidate the top edge of all the pages in a book, and connect the pages to wooden covers.



The wooden covers were anchored to the book at a second point with sewing, adapted from the blanket stitch, which is still used today to finish the edges of textiles. Thread Library is searching for an example of the blanket stitch for our collections. Please let me know if you'd like an introduction to our acquisitions staff.



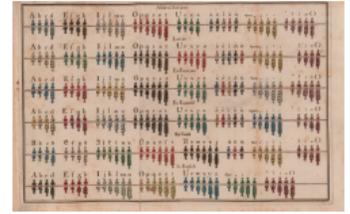
Although the codex book is probably what we think of when we think 'book,' the poet Amaranth Borsuk notes that "From the vantage point of the twenty-first century, our own codex book has been normalized to such a degree that we question the 'bookness' of anything that challenges our expected reading experience ... reading in one direction rather than another, scanning text silently, and putting a title and author's name on a book's cover are all learned behaviors." (18) At thread library, we seek to normalize embodied, and in particular, tactile approaches to reading.



Consider Andean khipu---the height of this technology, which used a system of knots in string to physicalize information, was during the Inca Empire in the 15th century. To read a quipu requires literacy in color, texture, a variety of knots, and their relative placement.



Scholars debate about whether Khipu just encoded numbers, or whether some examples also store phonetic information—language. If so, khipu would be one of the only known 3D writing systems. Museums in Europe hold the majority of these South American textiles; note that the catalog of the British Museum classifies khipu as “communications equipment.”



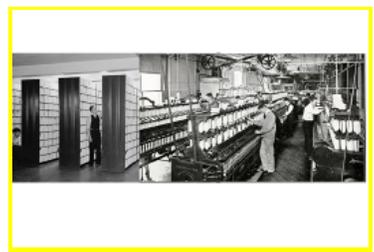
Is a khipu a book? Can a thread be read? At Thread Library, we understand a book to be a compression of information. Thread is many strands of fibers, twisted and plied. Threads, like pixels, range from hundreds to thousands per inch of cloth. Compared to a scroll or a clay tablet, a codex is a particularly condensed way to store information.



This is much of what has made it such an enduring format. Like books, textiles are portable and compact information storage devices. That is why we catalog each of our threads as if it is a book. Following my remarks tonight, I’ve invited our cataloger to outline our unique cataloging methodology here at Thread Library.



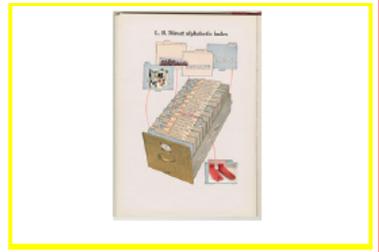
In terms of whether a thread can be read, the author Pierre Bayard has argued that even for the most dedicated readers, the main way we engage with books isn’t textual. There are simply so many books in existence that, by necessity, non-reading is our primary way of relating to books. ([How to Talk About Books You Haven’t Read 1](#)) As an example, take any library’s stacks.



As scholar Sheila Liming wrote, “Books, non-books, and everything present on bookshelves are there as the result of a series of choices.” (What a Library Means to a Woman 41) As Thread Library’s curator, the collections development policies I write set parameters for what we collect. Currently, Thread Library operates solely on a basis of donation. We accept all the threads which are donated, and we have a broad definition of thread. This means that we do not really choose what is on our shelves--rather, curation at Thread Library is more about the choices we make as we classify and present our collections.



A key component of this is our card catalog. I'd now like to turn the time over to our cataloger, who will discuss Thread Library's unique cataloging practices.
This concludes my portion of today's Thread Lecture. Thank you so much for hosting us today at Visual Studies Workshop.

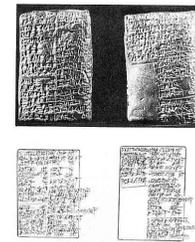


Thread Librarian⁴

Hello, I'm India Johnson, the cataloger at Thread Library. I just have a few slides for you tonight—I spend a lot of time in our stacks and I feel more comfortable talking to thread than people. But our outreach librarian talked me into this, and she suggested I talk about the inspiration for our card catalog, so going back to one of our curator's comments, the earliest writing surfaces were probably stone or clay. This slide shows how clay tablets were organized into some of the first libraries. The tablets were organized by shape. All the round tablets have one kind of information—say, census records—and the rectangular tablets have a different kind—say, agricultural records. In this library, organizing by shape is also organizing by subject.

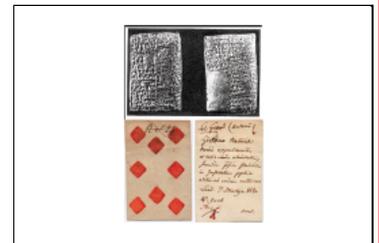


Originating in what is today Iraq, this tablet from 2000 BC contains a library catalog: a list of literary works written on other clay tablets. These ancient catalogs suggest that systems for sorting information are just as old as the idea of information itself.



For most of history, library catalogs were more or less long lists of books—quite similar to these tablets.

Index cards first became a standard way to catalog books after the French Revolution, when books owned by the church were suddenly owned by the state. An entire country of books needed to be cataloged at once. Talk about a backlog.

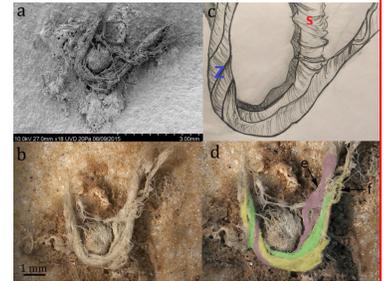


At the time, playing cards were blank on one side. They were a widely available form of pre-cut paper. Writing down the basics—title, author, and date—on the back of a card was a practical solution to a massive problem. But the benefits were quickly apparent. A catalog made from scraps of paper was much easier to update than a list, and it could be re-arranged by subject. The most effective cataloging methods tend to understand information as a collection of fragments.

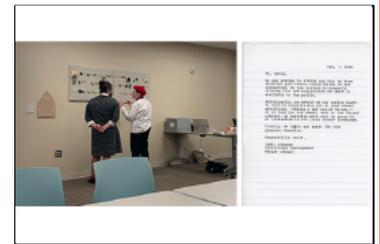
Just like the concept of the card catalog, the English word ‘file’ was borrowed from the French word for ‘string.’ Once paper became common in Europe, letters, forms, and receipts were strung together on a thread and suspended from the ceiling, as we can see here in the background of this painting. For centuries, thread was both the material for filing, and the method for organizing information.



Archeologists have a system for classifying ancient thread and textile remnants, which are called ‘thread objects.’ One main category is the direction of the final twist, which will be either an S or Z. Other data includes the width and length of the threads, and the structure of each individual ply. Our catalog cards do include a field for technical details like twist, ply, and dye, if they are relevant.



But who decides what is relevant? When a Thread is donated, obviously the donor has some say in what’s included. Donors provide info about who, what, and where to contextualize the thread. If the information is sparse, we include most or all of it. If there’s a lot of info, the cataloging staff has to make a call about what will be most meaningful for a reader. Keep in mind that while catalog entries can sound quite authoritative, every card is written by a particular person. This means that even when applied consistently from book to book, a cataloging method will never be objective.



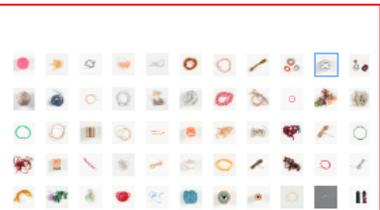
Some ways of organizing libraries actually embrace a subjective approach, even encouraging readers to rearrange the books. There is an art library in Switzerland that attaches an RFID tag to each item. If patrons re-organize the material intuitively, all the titles can still be located. There are numerous reasons to organize a library by association. At Thread Library, we even embrace intuitive association in our cataloging process. In fact, associative thinking is probably the only way to assign subject headings to a Thread.



Our staff is really small, and we always have a large cataloging backlog. It’s really lovely to spend this time with you ...

Thread Librarian⁵

Hello, I’m India Johnson—did the cataloger introduce me? head of digitization at Thread Library. was recently brought on at Thread Library to lead our new digital initiative. This project will bring our collections into the 21st century, with a searchable online catalog of our threads, and a digital imaging workflow to photograph each thread in the collection.



You might associate thread with the personal, the sentimental, the tactile, the decorative, and the feminine. What may be less apparent is that from the first computers to today's touchscreens, digital culture depends on textile technologies, including labor models common in the textile industry. (Monteiro 2)



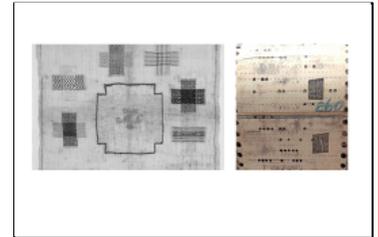
First of all, think about how textile metaphors just ... saturate our language around digital culture:

“Threaded” discussions

“Linking” (a term for how knitted fabrics are constructed)

“Patches” in computer programs

The interNET



This isn't a coincidence, since the first rewritable computer memory was actually created through a weaving process. This memory was called core memory, and it was woven by hand on a pin loom. Pin looms had their heyday from the 1930s to the 1970s. Common projects were potholders and blankets.

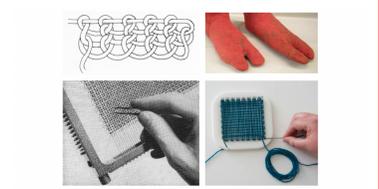
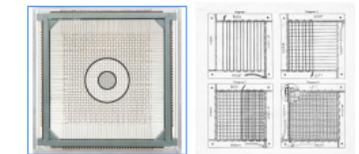


Fig. 34 - early core memory plane (left); pin loom (right)

Popular craft weaving kits had names like “weavette” or “easiweave.” But they didn't simplify weaving itself, just the process of setting up the loom to weave, known as warping. Pin looms could be warped diagonally, and that's how core memory was constructed, too.



The vertical and horizontal in a core memory plane were called “write” wires, and the diagonal wires were called “read” wires.

Core memory planes also relied on textile techniques adapted from beading looms. One engineer who worked on developing core memory described it this way: “This fixed memory is actually composed of magnetic cores with wires woven in and out, sewn in with a pattern, where the information ... is in the pattern of the sewing.” (49) You can see it's incredibly intricate handwork. Who wove these memories?

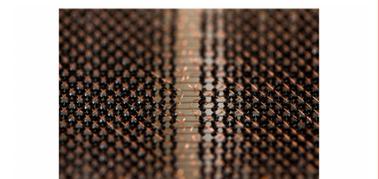


Fig. 36 - core memory plane (detail)

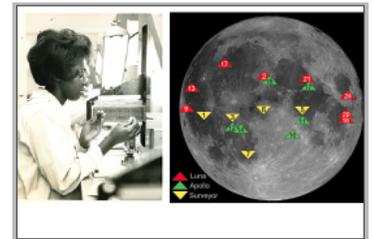
The first core memory plane was woven by Hilda G. Carpenter, pictured here. We know little else about her. Carpenter, and the other women behind core memory production, are called the “memory weavers.” We know very few of their names, and there are no accounts of their work in their own words.



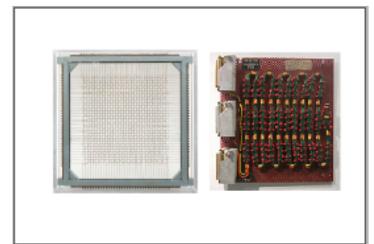
To reconstruct the history of the memory weavers, researchers have had to rely on secondhand accounts: oral histories from the male engineers who worked at NASA. In these tellings, the memory weavers are described as laid off or retired textile workers, and the weaving technique as LOL or little old lady.



One of the first visionary uses for computers was landing a space shuttle on the moon. According to David Mindell, a historian of the space age, “NASA was well aware that the success of its flights depended on the fine, accurate motions of these women’s fingers.” (51) (David Mindell)



Computers that navigated the Apollo missions to the moon needed more durable and compact memory, so engineers developed rope memory. This involved removing the wire weaving from the loom, rolling it up, and bundling it. Rope memory was also woven by hand.

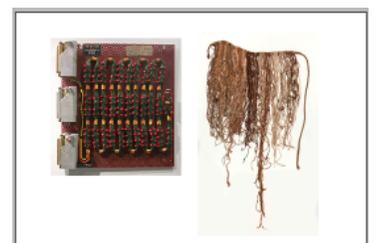


Loom for weaving rope memory, which was fine, repetitive, painstaking work. The memory weavers gained the technical ability to weave electronics through labor in textile mills or at home. However, accounts of the memory weavers characterize their weaving as an inherently feminine ability instead of an acquired skill.



I want to take issue with one of our curator’s earlier remarks—she said that scholars debate about whether khipu record language, or just numbers.

Core rope memory encoded just 1s and 0s, and it took us to the moon.



According to the engineer Daniela Rosner, “Weaving and space travel are not as separate as we imagine them to be.”

Woven core memory planes are also the technology that gave rise to touchscreens. Underneath the glass of a smartphone is a wire grid, woven on the diagonal.



Fig. 42 – Information society (history of)

According to the anthropologist Stephen Monteiro, “The touchscreen functions through variations of electrical impulses on the micro-fine wire grid, just as the core memory plane did. Now, however, those impulses are activated by the fingertip and the small, repeated strokes it makes across this base fabric, like a needle in embroidery” (58)



Fig. 43 - Information society (basis of)

He claims that the way we use phones and tablets is similar to craft textile production—the gestures and rhythms are alike. So are the labor conditions.

Consider that social media and touchscreen gaming involve “tasks of matching, coordinating, and connecting.” Consider that these tasks blur labor and leisure. Consider the similarities between cottage media production and cottage industry: small, repetitive gestures that make every pocket of time productive.



Monteiro claims that, “Like textile assembly, much of [what we do on touchscreens] entails taking extant material—in this case, data in the network accessed through image-based interfaces—and binding it together in new, flexible patterns” (86) But who profits most from a piecework model for digital labor?



On one hand, textiles connect us to the past. We enjoy making physical things with needle and thread because we evolved to engage with the world around us in embodied, tactile ways. Experiencing digital technologies in a human body might be thought of as running 21st century software on ancient hardware. On the other hand, humankind’s long history of social and physical engagement with textiles wired us to digitally encode, share, and organize information.



Turn time over to Outreach & Engagement Librarian for Q & A