

Paper and Other Writing Materials: Part I

Because paper is so inexpensive and prevalent, it is sometimes difficult to imagine how precious a commodity it once was. For millennia, people sought ways to preserve their communications, their thoughts, their legal matters, and their art, using many different materials, including paper.

Paper is defined as a matted or felted sheet made primarily of cellulose fibers, formed on a wire screen from water suspension. This Historical Note will describe some of the materials used as forerunners to the actual development of paper; next month, I will go into detail on how paper itself came to be invented, along with centuries of adaptation and modification.

Stone was the first medium people used to preserve images. Most of us are familiar with the prehistoric Lascaux Cave paintings in France, and countless later records have been preserved by carving images and characters into tablets of stone. The ancient Egyptians used sharp chisels to engrave hieroglyphics into polished stone columns. In 1887 one of these surviving stone obelisks was brought to London from Egypt. A 70-ft-tall obelisk was transported from Alexandria to New York in 1880; it still stands on display in Central Park.

The ancient Chaldeans, Assyrians, and Sumerians used a wedge-shaped bone to press characters into bricks or tablets made of soft clay. After the complete message had been recorded, the clay was then baked until hard, preserving the characters in a durable format. The clay tablets or bricks could be passed from one person to another to convey messages or record accounts. Surviving clay tablets from Babylon date from as early as 3500 B.C.

Other ancient civilizations used plates of bronze, copper, or brass on which to engrave the text of treaties, alliances, and laws. Before going into battle, Roman soldiers scratched their wills or messages to family on the scabbards of their swords or on belt buckles. The book of Job mentions the practice of using an iron pen to scribe characters on a sheet of lead.

Before Homer's time in ancient Greece (9th century B.C.), flat sections of wood, usually from the box or citron trees, were covered with a thin coating of wax, plaster, or chalk. People used a metal or bone stylus to scratch letters into the coating. Such

written messages could be erased by re-coating the boards, which were then reused. A series of boards could be bound together with leather thongs to make a heavy volume, called a codex or "table book." The codex could contain long poems or detailed legal records. Codices continued to be used long after the introduction of paper. Chaucer mentioned their existence in England well into the 14th century.

Large leaves were also used as writing materials. The Roman naturalist Pliny speaks of how the Egyptians used palm leaves for writing, while the Roman historian Diodorus Siculus mentions that olive leaves were used in Syracuse to write the names of criminals sentenced to be banished. Until recent times, leaves of the talipot tree and aloe plant were used by scribes in India and Ceylon.

Indian calligraphers also used long strips, two inches wide, cut from leaves of the palmyra tree. A metal stylus etched an indentation in the leaf surface; the indentation was then filled with a black pigment to make the letters stand out. Two holes were punched in the long leaf strips, which were then stacked sequentially and bound together with cords. From this practice comes the term "leaf" and "overleaf" for modern books.

Tree bark was also pressed into service for recording documents and artwork. American Indians drew pictographs with liquid pigment and wooden sticks on the clean white surface of birch bark. The Aztecs and Mayans made a writing material by beating the inner bark of moraceous trees. The people of Java beat mulberry bark into a material similar to paper. "Rice paper," used in China for painting, actually has nothing to do with rice, but is instead made from thin spirals of the inner pith of the *Fatsia Papyrifera* tree found in Formosa. The ancient Romans also used the inner bark of trees, which they called "liber"; this is the root for the word "library."

Parchment, made from the split skin of sheep, was probably used as early as 1500 B.C., though it did not come into extensive use until the reign of Eumenes II of Pergamum in the second century B.C.

The flesh, or lining, side of the sheep skin is converted into the best parchment. Vellum, similar to parchment, is made from goatskin, lambskin, or calfskin; vel-

lum uses the entire skin, rather than just the inner side. Vellum can be distinguished from parchment because vellum retains an irregular surface from grain or hair marks.

To make parchment or vellum, the skin is washed, rubbed with lime, scraped clean, washed a second time, then stretched tightly on a wooden frame. More scraping removes the rest of the irregularities, and then the entire surface is dusted with chalk and rubbed smooth with fine pumice. The preparation with lime gives the material a more papery feel than does true tanning.

Since even the finest vellum shows some differences between the hair and the flesh side, medieval scribes took care to select skins of similar color and texture before copying books. They would make sure that hair side faced hair side in the bound volumes, so that differences would not be too noticeable. To produce a single copy of the Gutenberg Bible required the skins of about 300 sheep. Parchment continued to be used in Europe even after the advent of paper, but was not applied to printed works after about 1500. It is still used, though, for calligraphic purposes and important documents and diplomas.

Papyrus was the first writing material to assume many of the properties associated with paper; it was also the most widely used writing material in ancient times. In fact, the word "paper" is derived from "papyrus." Fibrous layers from the stem of the papyrus plant were pressed flat and laid side by side, then another layer was placed at right angles on top of the first. The sheet was then dampened and pressed, and the drying sap would glue the laminated layers together. Papyrus continued to be used in the Mediterranean until the 10th century A.D., when it was replaced by parchment. The papyrus plant grew profusely in Egypt a thousand years ago, though now it is nearly extinct.

When the camel's hair brush and special calligraphy inks were created by the Chinese around 250 B.C., better writing surfaces were required. The Chinese developed finely woven cloth on which to write fine characters. Long scrolls of this cloth comprised the first truly convenient and lightweight books.

Chinese cloth and feltmaking techniques gradually became sophisticated enough to allow the manufacture of true paper, which was first produced around 105 A.D.

KEVIN J. ANDERSON