

Braid

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A **braid** (also referred to as a **plait**) is a complex structure or pattern formed by interlacing three or more strands of flexible material such as textile yarns, wire, or hair. Compared with the process of weaving, which usually involves two separate, perpendicular groups of strands (warp and weft), a braid is usually long and narrow, with each component strand functionally equivalent in zigzagging forward through the overlapping mass of the others. The most common braid is a flat, solid, three-stranded structure. More complex braids can be constructed from an arbitrary number of strands to create a wider range of structures. Braids have been made for thousands of years^[1] in many different cultures, and for a variety of uses. Traditionally, the materials used in braids have depended on the indigenous plants and animals available in the local area.

When the Industrial Revolution arrived, mechanized braiding equipment was invented to increase production. The braiding technique was used to make ropes, with both natural and synthetic fibers, and coaxial cables for radios using copper wire. In more recent times it has been used to create a covering for fuel pipes in jet aircraft and ships, first using glass fibre, then stainless steel and Kevlar. Pipes for domestic plumbing are often covered with stainless steel braid.

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Prehistory and history

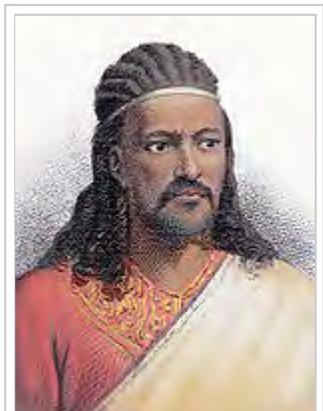
The oldest known reproduction of hair braiding may go back about 30,000 years: the Venus of Willendorf, now known in academia as the Woman of Willendorf, is a female figurine estimated to have been made between about 28,000 and 25,000 BCE.^[2] It has been disputed whether or not she wears



Nuba tribes woman from Sudan wearing braids



An Egyptian child with a "Lock of Youth" plait hairstyle



Tewodros II of House of Solomon wearing braided locks

braided hair or some sort of a woven basket on her head. The Venus of Brassempouy is estimated to be about 25,000 years old and shows, ostensibly, a braided hairstyle.

Another sample of a different origin was traced back to a burial site called Saqqara located on the Nile River, during the first dynasty of Pharaoh Menes.

In some regions, a braid was a means of communication. At a glance, one individual could distinguish a wealth of information about another, whether they were married, mourning, or of age for courtship, simply by observing their hairstyle. Braids were a means of social stratification. Certain hairstyles were distinctive to particular tribes or nations. Other styles informed others of an individual's status in society.

African people such as the Himba people of Namibia have been braiding their hair for centuries. In many African tribes hairstyles are unique and used to identify each tribe. Braid patterns or hairstyles can be an indication of a person's community, age, marital status, wealth, power, social position, and religion.^[3]

Braiding is traditionally a social art. Because of the time it takes to braid hair, people have often taken time to socialize while braiding and having their hair braided. It begins with the elders making simple knots and braids for younger children. Older children watch and learn from them, start practicing on younger children, and eventually learn the traditional designs. This carries on a tradition of bonding between elders and the new generation.

Early braids had many uses, such as costume decoration, animal regalia (like camel girths), sword decoration, bowls and hats (from palm leaves), locks (such as those made in Japan to secure precious tea supplies through the use of elaborate knots), and weapons (slings, for example).

Materials that are used in braids can vary depending on local materials. For instance, South Americans used the very fine fibers from the wool of alpaca and llama, while North American people made use of bison fibers. Throughout the world, vegetable fibers such as grass, nettle, and hemp have been used to create braids. In China, Korea, and Japan silk still remains the main material used. In the Americas, the braiding of leather is also common.

For the nomadic peoples of Africa, India, North and South America, and the Middle East, braiding was a practical means of producing useful and decorative textiles. In other areas, such as the Pacific islands (where leaves and grasses are braided), and for many hill tribes, braids are made using minimal equipment. It was only when braiding became a popular occupation in the home or school, as it is in China and Japan, and when the Industrial Revolution came about, that specific tools were developed to increase production and make it easier to produce more complicated patterns of braids.

Braids are also very good for making rope, decorative objects, and hairstyles^[4] (also see pigtails, French braid). Complex braids have been used to create hanging fibre artworks. Braiding is also used to prepare horses' manes and tails for showing such as in polo and polocrosse.^[5]

Ropes and cables



A step by step creation of a basic braid using three strings

Braiding creates a composite rope that is thicker and stronger than the non-interlaced strands of yarn. Braided ropes are preferred by arborists, rock climbers, and in sport sailing because they do not twist under load, as does an ordinary twisted-strand rope. These ropes consist of one or more concentric tubular braided jackets surrounding either several small twisted fibre cords, or a single untwisted yarn of straight fibres, and are known as Kernmantle ropes.

In electrical and electronic cables, *braid* is a tubular sheath made of braided strands of metal placed around a central cable for shielding against electromagnetic interference. The braid is grounded while the central conductor(s) carries the signal. The

braid may be used in addition to a foil jacket to increase shielding and durability.

Another use is for litz wire which uses braids of thin insulated wires to carry high frequency signals with much lower losses from skin effect or to minimise proximity effect in transformers.

Flat braids made of many copper wires can also be used for flexible electrical connections between large components. The numerous smaller wires comprising the braid are much more resistant to breaking under repeated motion and vibration than is a cable of larger wires. A common example of this may be found connecting a car battery's negative terminal to the metal chassis.

Similar braiding is used on pressurized rubber hoses, such as in plumbing and hydraulic brake systems in automobiles. Braiding is also used for fibres for composite reinforcements.

A property of the basic braid is that removing one strand unlinks the other two, as they are not twisted around each other. Mathematically, a braid with that property is called a Brunnian braid.

Australian plaiting

Plaiting (or braiding) with kangaroo leather has been a widely practiced tradition in rural Australia since pioneering times. It is used in the production of fine leather belts, hatbands, bridles, dog leads, bullwhips, stockwhips, etc. Other leathers are used for the plaiting of heavier products suitable for everyday use.^[6]

Other braids

Gold braids and **silver braids** are components or trims of many kinds of formal dress, including military uniform (in epaulettes, aiguillettes, on headgear).

Metaphors

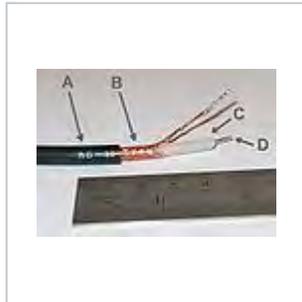
Braids are often used figuratively to represent interweaving or combination, such as in, "He braided many different ideas into a new whole."

In some river and stream systems, small streams join together and redivide in many places. Such stream systems are said to be braided.^[7] These are often found in alluvial fans at the outlet of canyons. This is a result of heavy sediment deposition at high flows followed by re-erosion at low flows. See also river delta.

Gallery



A braid



A coaxial cable with braided copper wire EMI shielding (B)



A gold braid on a police uniform



The braided streams of the Tanana River.



Wikimedia Commons has media related to ***Braids***.

See also

- Braid theory
- Cornrows
- Crochet braids
- French braid
- Kumihimo, Japanese braid

Ply-split braiding

- Sennit
- Stockwhip

- Box braids

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