

THREAD OF TIME

~A HISTORY OF SILK

PART 9: MORE THAN MOTHS

Almost as soon as the method of sericulture became widely understood people began to experiment with ways to produce silk from other creatures. Although many Arthropods produce silk, spiders have long been known as among the best, not only for their webs but also for protecting their egg sacs and storing prey. Some have also devised ingenious ways of using their silk including using threads as safety lines enabling them to make huge leaps. Others use threads as to guide them back to their burrows. Perhaps the most astonishing is how some small spider species use a technique known as “ballooning.” A long strand is released skywards which then uses a combination of static electricity in the atmosphere and air currents to lift the spider as high as four kilometres into the air. Once airborne the currents allow the spiders to travel long distances. Although the silk of spiders is strong and versatile, comparable in fact with that produced by the caterpillars of moths, the quantity cannot match that of *Bombyx mori*. Also, spiders are not renowned for warm, cuddly appeal. Quite the opposite in fact. Spiders are generally either regarded as unpleasant at best or at worst, downright scary. So it may be their general lack of appeal that has hindered progress in utilising their silk.

The earliest records concerning the collection of spider silk with a view to weaving cloth were made in the 1600s by Dr Epifanio Ferdinando, an Italian physician. A friend of his managed to collect 450 grams of spider silk but the effort required led Ferdinando to conclude that there could be no economic basis for further exploration. It is worth noting that at the time Ferdinando came to his conclusion, Italy already had a hugely successful silk weaving industry using imported silk thread to supplement its own silk production from along the valley of the River Po, so spider silk would have needed to demonstrate clear economic advantages if it was going to compete.

In the early 1700s, at about the same time as France was developing its own sericulture industry, one François-Xavier Bon, began experimenting to produce silk from spiders. He collected spiders and their cocoons until he had enough silk for a pair of stockings and gloves. He asserted that as the garments weighed less than those from the traditional *Bombyx mori* moth, it was worthwhile to pursue the experiments further. The main criticism of his gloves and stockings was that they lacked the lustre of traditional silk, the reason being that the process of making spider silk into usable thread involved washing, beating and carding the silk rather than the simple twisting of continuous lengths of moth made silk. Following Bon’s presentation a young man named René-Antoine Ferchault de Réaumur was appointed to find out if spider silk could be produced in a profitable manner. After months of investigation he concluded that the cost of producing viable spider silk would be 24 times greater than the silk of the *Bombyx mori* and therefore, unlikely to prove profitable. As others began to experiment they encountered similar problems - spider silk could not match that of *Bombyx mori* for lustre, thread length or quantity. However, it was suggested that perhaps larger species of spider known to exist beyond Europe might produce greater quantities and longer threads and therefore, be more suitable for silk production.

As exploration of other continents grew, attempts were made to extract the silk of larger spiders and indeed it was discovered that some do produce larger quantities of silk. Probably, the most spectacular is the silk from the Madagascan spider, *Nephila madagascariensis* or orb-weaver spider which naturally produces a golden coloured silk. However, in spite of the spider’s size and the 90cm diameter web they build, vast numbers of spiders are needed to acquire sufficient quantities of silk. However, spider silk has been found to have some unique properties that make it highly suitable for some very special uses, mainly in medicine.

Perhaps the most unusual and unlikely source of silk comes from the sea. The correct name for the extremely rare sea silk is byssus. The raw material is found in the waters around the Sardinian island of Sant'Antioco and comes from the solidified saliva of a large clam, known in Latin as *Pinna Nobilis*. There is thought to be only one person left who can harvest the byssus, spin it and weave it. She is Chiara Vigo. She goes out early in the morning to dive for the saliva of this protected specie accompanied by members of the Italian coastguard. It takes 300 to 400 dives to gather just 200g of material. Only then can she begin the weaving process but the finished items are never sold. It is widely believed that anyone trying to profit from byssus will certainly fail.



Artificial silks were first developed in the late 19th century and came into prominence in the 1920s. They use cellulose made from wood pulp and other plants mixed with chemicals. Over time the quality of artificial silks has become so good it is difficult to tell the difference from pure silk without resorting to tests that could destroy the fabric.