Stories from the Shed

The Wandle Wardrobe: getting dressed with STEAM

Elly Platt

Come on a time-travelling journey through the textile history of the Wandle!

Travel back 123 years, to the year 1900, to take a peek into the life of a fictional young woman called Lavender, who lives next to the River Wandle. Lavender is 21 years old, and works as a dressmaker, making fashionable clothes for the rich ladies of Carshalton to wear when they go up to London.

Lavender comes from a long line of workers who have been part of the textile trade taking place on the banks of the Wandle.

None of them have university degrees, most of them would have left school early to take apprenticeships in their future workplaces, but they have all understood maths, applied chemical formulas, operated machinery and used the latest in ever-changing technology to process and embellish the textiles that make up our clothes.

Lavender is lucky, she has one of the nicest jobs in textile manufacturing. She works in a dressmaker's shop. Her rich clients can be demanding and sometimes she has to work long hours to make up a last minute order, but her boss pays her fairly. Lavender's family don’t have to worry where their next meal is coming from.

Throughout history, many people in the textile industry haven’t been so lucky. The Industrial Revolution in the 18th and 19th centuries changed spinning and weaving from work that people would do by hand in their own homes to industrial processes that would take place in factories. More and more people were needed to work in this industry, and many of them were treated very badly.

Cotton plantations in America forced enslaved people to pick this prized crop. People were kidnapped from their homes in Africa and made to work without pay.

Once harvested, the cotton was shipped across the Atlantic Ocean to England, to big mill towns in the North like Manchester, where it was spun into thread and woven into cloth. The factories were noisy, dusty and extremely dangerous, full of fast-moving machinery. Children as young as seven had to work twelve hour days for pennies, and injuries were common.

Fortunately, throughout the nineteenth century, many people objected to the mistreatment and exploitation of people working in the textile industry. Laws were passed making slavery and child labour illegal.

Lavender didn't have to spend her childhood in a factory; she was able to attend school, and spend time playing with her brothers and sisters. The William Morris print works at Merton had some of the best facilities for young workers starting their apprenticeships: the boys in the Apprentice House had a library and a garden to enjoy when they weren't at work.

One of the oldest jobs on the Wandle was calico bleaching - the banks of the river had been calico bleaching grounds for hundreds of years.

When calico cloth is woven from cotton or flax it is naturally a pale beige colour. But people wanted a bright white cloth, especially for dyeing so the colours would look more vibrant.

Recipe for calico bleaching:
Treat calico with: wood ash, from log fires
quicklime, from limestone
Lay out calico in the sun on grassy fields.
Rinse calico in river water
Rinse calico in sour milk
Repeat until calico is white!
(This may take several weeks.)

As scientists began to understand the elements that make up our world, they gave each element a name and a chemical symbol.
Wood ash = Sodium Carbonate **Na_2CO_3**
Quicklime = Calcium Oxide **CaO**
which made Sodium Hydroxide **NaOH**

The fabric becomes white as the bleach and the ultraviolet rays of the sun break down the chromophores - the molecules in the calico that make it look beige to our eyes.

Sour milk = Lactic Acid **$CH_3CH(OH)COOH$**
To wash out the bleach so the dyes will show their true colours.
This was replaced by Sulphuric Acid **H_2SO_4** when it started to be mass produced in the 19th century.

Modern bleaches, Sodium Hypochlorite **NaClO** and Calcium Hypochlorite **$Ca(ClO)_2$** were created in the 19th century, and bleaching could be done in big tanks in factories rather than on the bleaching grounds.

A wide variety of plants and even creatures were used for dyeing fabric, and Lavender knows the stories behind the different colour fabrics she uses: every lady has her favourites. Some of these colours come from native plants, and some are imports from all around the world.

The cochineal beetle lives on cactuses in Mexico, and produces a vibrant RED colour. There were cochineal mills on the Wandle near Wandsworth.

Logwood produces a deep PURPLE dye, and was sought after for centuries to make dark coloured clothing. There were several logwood mills along the Wandle, grinding up the wood that had been brought all the way from Brazil.

Indigo, famous for its BLUE hue, came from Africa and Asia.

Lavender has heard the story of the near-mythical Tyrian PURPLE from the Murex mollusc used to dye the togas of Roman emperors: so rare and expensive it was for Kings and Queens only!

The William Morris print works in Merton used a wide range of natural dyes from plants that were easy to grow in Britain:

DARK BROWN from the Walnut tree

BLUE from Woad

YELLOW from WELD

RED from Madder

YELLOW dyes can be made from some surprising plants - including onion skins!

The frill on the petticoat in this exhibition is dyed with hawthorn leaves - using a substance called a mordant helps the dye molecules to bind to the fabric to stop the dye washing out.

Maths is a vital skill for a dressmaker!

Fabric for making clothes in 1900 is ordered by the yard (about 10cm shorter than a metre).

Fabric is expensive! if Lavender orders too much her customers might complain about being overcharged; if she doesn't order enough she won't be able to make the garment.

Every lady who wants a dress made for her will have a set of measurements taken: height, bust, waist, hips, even around the neck and wrists! Lavender can use those measurements to create a pattern for the garment.

For fashionable garments, proportion is also important. In 1900 a loose blouse with a full sleeve is popular, worn with a long skirt with a ruffle around the hem. The skirt should be flatter at the front, and fuller at the back, creating a slight train. Lavender's knowledge of fashion and maths combines as she works out the proportion of the garment according to her customer's measurements so she can order the correct amount of fabric.

Many of the fabrics Lavender works with are dyed in vibrant colours using chemical or aniline dyes.

These were discovered by accident in 1856 by a young chemist named William Perkin. He was trying to make quinine, a medicine used to treat malaria. What he made instead was an extraordinary bright PURPLE colour. Perkin was interested in painting and photography, and began to wonder if he had created a new pigment or dye. He called the colour he'd created Mauvine, and it became extremely popular, with every fashionable person wanting to wear this vibrant new colour.

Then the race was on to create more bright synthetic colours, and safety wasn't always a top priority. The brightest GREEN was made using arsenic, a known poison. The green was sought after for wallpaper as well as fashionable clothing, but the dye wasn't stable and moisture could release the arsenic. A person sweating in their green clothes or sitting in a damp room could be poisoning themselves without realising! Nowadays we understand the effects of the chemicals we use in dyes much better, and we now have dyes we can use at home quite safely.

Two of the best-known names in fabric design, William Morris and Liberty, had factories on the Wandle, where they hand-printed their intricate designs, inspired by the natural world.

The printing process needed extreme precision and accuracy from the men who worked in the print works. The fabric would be stretched on a long table, pinned out exactly so the pattern would sit straight across the fabric. The position of the pattern would be calculated and marked, and then a wooden block would be used to print each section of the pattern. The blocks had to be precisely placed as more blocks, each with a different colour, would be layered over the top to create the pattern. This was an extremely skilled job, and an apprenticeship with William Morris or Liberty would set a young man from Mitcham or Morden up with a good career.

Lavender has also been set up with a good career, because although ready-made clothes are now available from the brand new department stores in London, her local clients still prefer their made-to-measure gowns.

There is one key piece of technology that makes Lavender's life much easier - the sewing machine. It was invented in 1851, and until the early 20th century, when electricity started to become more common in homes and workplaces, sewing machines were people-powered. They would either be powered using a treadle, which was a foot pedal, or a hand crank, which you would turn as you sewed. This sounds like hard work, but it made the process of making a garment much quicker. Before the sewing machine was invented, every stitch would have to be sewn by hand.

The world has changed a lot in 123 years, but even sewing machines that run on electricity and have computer programs for fancy stitches have to be operated by a person. There are no robots that can make our clothes. So there are still plenty of young women like Lavender out there all over the world, making clothes for all of us to wear.

The Wandle has changed so much in the last 123 years too, but I hope when you go for a walk down the river you might imagine all the people who have worked there, creating a rainbow of beautiful fabrics from natural wonders, dangerous chemicals, failed experiments and even the light from the sun.

Elly Platt

Costume Maker, Textile Artist,
Creator of the Wandle Wardrobe.

I was inspired by the rich local history of the River Wandle as a site of textile production in the past and my knowledge of fashion history to create a storytelling project that combined the two.

Created specifically for Sutton STEAMS Ahead, I wanted to show just a few ways that Science, Technology, Maths and Engineering have been used by textile workers for hundreds of years. This costume showcases many of the textile processes that took place on the Wandle, while the story sets them in the context of the global textile industry.

The garments are made from upcycled fabrics - I sourced old cotton bedsheets to maintain my practice of working as sustainably as possible. Garments have been dyed with a mixture of homemade natural dyes and commercially available chemical dyes.

To find out more about my work:
Instagram: @ takeitupwearitout
Blog: www.blogspot.com/takeitupwearitout