

Woad, *Isatis tinctoria*

Woad is thought to have been used in the Holy Land in biblical times and may have been used to dye the robes of the high priests in Jerusalem.

Woad was a lucrative crop in the 16th century when cloth-in was ostentatious and extravagant, and blue a fashionable color. Three pieces of cloth required a barrel of woad and a burger's wife might pay as much for one dress as would buy a small house.

The preparation of woad demanded fermentation similar to that of indigo. The leaves were picked, put into vats, fermented, dried and made into balls. The balls were dried 4-6 weeks and ground into powder, then wetted and stirred. The process of wetting and turning went on for 8-10 weeks to ferment.

It is said that Queen Elizabeth would not travel near the woad towns because of the stench; a decree forbade processing woad within 5 miles of the royal estates.

Woad was used for the beautiful blues in Medieval and Early Renaissance paintings, especially the blue robe of the Virgin Mary. Woad was mixed with plaster or egg white depending on the color wanted. It was also used to mix with indigo to cut expenses and in obtaining a black dye.

Woad is still used today as an ingredient in the blue uniforms of the London police.

Efforts were made to grow woad in Colonial America, especially in Conn. but it <sup>inferior quality - probably due to poor processing</sup> never really made much impact. <sup>wood was the first blue dye used by Colonists, carried over from Europe.</sup>

Madder, *Rubia tinctorium*

Linen dyed with madder has been found in Egyptian tombs on mummies. The Greeks and Romans used madder and in the 5th century it was grown in the Near East and imported to Europe. In the 7th century it reappeared as a European crop. In the 1500's Holland was the major source followed by France. Most madder imported to America came from Holland and France.

Strangely madder was never widely cultivated in America although conditions were considered quite suitable. In

American colonists brought <sup>in</sup> it to the <sup>new</sup> lands with them. It was the principal red dye during the 18th century. The color is obtained from the roots. Homegrown madder was simply prepared according to Thomas Jefferson who grew it on his plantation. It took 3 years for roots to reach peak yield. Fresh roots were beaten into a paste 12 hours after the roots were washed. He claimed fresh roots were twice as potent as dried root. Commercial madder imported from Holland went through many more complicated preparatory steps. First the roots were oven dried then pounded into powder. The husks removed in this first <sup>use</sup> pounding <sup>and</sup> sold at a low price

Next a second pounding resulted in separating out 1/3 of the remaining roots and after sifting these husks out, they were sold as intermediate quality. The final pounding left only the interior pure, bright part of the root. Then the madder was packed in casks and aged for 1-2 years for the potency to increase. Buyers had to contend with over aging, the possibility of adulteration with brick dust, sand, mahogany wood, almond shells, and other mineral and vegetable substances.

Madder was used to dye the British Army redcoat uniforms and also the red jackets of fox hunters. Madder was used in Europe and the U. S. until the last quarter of the 19th century when alizarin, it's main constituent was synthesized.

Madder staple dye for wool, cotton & silk

### Weld-Reseda lutea

Weld is considered the oldest yellow dye known to man. Romans considered weld as a color to symbolize purity and used it for bridal gowns.

Weld is a small plant native to Afghanistan and Iran and to the Middle Eastern basin. ~~XXXXXXXXXXXX~~ The dye is extracted by a water bath and the leaves, stems, and seeds of the plant are used. Large amounts of weld was required because the coloring matter was not concentrated. Weld was never used a great deal in America, mostly because expensive and many yellows available native to American soils.

### Quercitron-Quercus velutina

An Englishman, Dr. Edward Bancroft, on a journey to America learned that black-oak yielded an excellent yellow dyestuff (he named it quercitron) that he believed could become a cheap substitute for weld. It was exported and remained one of the dyes in commercial use until the second quarter of the 20th century. Before Bancroft published his discovery, American home dyers had probably used the bark of this locally grown tree for dyeing bright yellow woollens, cottons, linens, and silks.

Most color matter found in the inner bark or cellular coat of the tree trunk. ~~XXXXX~~ Ground into fine powder by millstones.

Usually the bark was mordanted with alum and cream of tartar. Wide range of proportions of bark to wool were used- from 1½ pounds of bark per 20 pounds of wool to 6-8 ounces of bark per 1 pound of wool.

In 1817 it was stated that the bark priced in New York for export was value at \$45-\$60 per ton. Quercitron contained much tannin and was used by tanners as well as dyers.

### Logwood-Haemaloxylon campechiannum

Logwood was one of the six principal dyes imported to America, where it sold for 6 cents a pound. ~~XXXXXXXXXXXX~~ Conflicts were fairly common over the logwood trade during the early years of the 18th century.

Logwood was introduced to England soon after Queen Elizabeth ascended the throne. In 1851, a law was passed prohibiting the use of logwood because the colors it produced were so fugitive. Actually too little was known about proper mordanting procedures to fix the dyes on the fibers properly at that time. The laws were repealed nearly a hundred years later during the reign of Charles II.

Logwood grew naturally in Central America, Mexico, and parts of Northern South America. The tree was marketable in 12 years. Logwood sold in form of logs 3-12 feet long, and rasped or chipped by the consumer. Buyers feared adulteration and preferred to chip up the log themselves. A Philadelphia news paper advertised chipped logwood produced by inmates of the Philadelphia prison for a reasonable rate, in 1798.

Logwood chips were wetted down and allowed to ferment slightly for a few days and then boiled in kettle of water. Depending on the mordants used the color ranged from silvery grays and purples to navy blues and was an important ingredient in dyeing black. The lavender and purples were more fugitive than the navy blues produced by mordanting with potassium bichromate, but this <sup>compound</sup> was not known until about 1800. Logwood

produced blues that were much cheaper than indigo blues, but not as fast. Logwood used, especially in compound dyes until World War II

### Home Dyeing in Early New York

Indigo was the most popular imported dyestuff. It took many days and much labor:

"To set a tub of 6 gallons, take five gallons of good old sig, to which add 2 gills of spirits, half apound of good indigo made fine; put it in a bag, wet it and rub it out in the dye, ~~then stir and mix it~~ then add two ounces of pearlash, and 2 ounces of good madder; stir and mix it all together, let it stand 24 hours; then add half a pint of wheat bran, stir it up all together, let it stand 24 hours longer, and if your dye does not come to work by this time, stir it as often as once in two or three hours, but do not apply your goods before your copper scum and froth rises, and the dye looks greenish when dropping, and your yarn or wool looks greenish when applied to the dye, which are symptoms that your dye is in good order for use; but you must be cautious not to crowd your dye too full, for many blue dyes are destroyed in this way. Be careful also about reducing your dye too low; always keep indigo in the bag, rubbing it out when necessary; and you need not stop your dye to recruit it after it has come to work; but make your additions when you take your goods out, as you find it necessary. Wring out the goods, stir your dye well together, cover it close, and place it where it will keep lukewarm.

It will not dye so quick as the other dye, but it will make a superior blue. It is commonly from two to three days in coloring for a deep blue. *Dyers Companion - Bemis*

The housewife preferred duller colors for everyday and work clothes and "boughten dyes were expensive. The frugal house wife frequently prepared walnut hulls, alder bark and butternut bark for browns.

Onion skins, goldenrod, ~~green~~ peach leaves, mullein and yellow oak bark made yellow. She also tried other herbs and weeds from the field and garden for other colors. Only experience taught her which were fast to washing and light. These recipes were passed from mother to daughter.

Red hues were obtained from imported madder and cochineal was used for scarlet. Cochineal was very expensive and used only for very choice pieces.

Elijah Bemis, author of "Dyers Companion" published in New York in 1815 states that for brown "butternut bark is the one most in use, and may be ranked as the first, it produces a great variety of shades and if rightly used its color is permanent, and is one of the greatest colouring substances in the Northern States.

Butternut bark could be used alone and the wool dyed at a scalding heat without special preparation. Copperas added after the dye was exhausted and the bark removed made a darker brown. The bark was best when used green but dry bark made a different shade and boiling had the same effect.

Most directions written for wool as this was the fiber most often dyed. Linen and cotton differed and were more difficult to dye successfully.

Mordanting was sometimes called "the water of preparation".

Alum was the most important. Copperas and tartar also were used. Nitromuriate of tin was used to set cochineal. Alum and tartar were used for madder and not boiled because boiling browned the color.

~~Some dyestuffs was used with several~~

Some dyestuffs were used with several different mordants for different colors.

More time was taken with mordanting than dyeing, evidently. Dyers Companion tells for yellow to boil with alum and tarter 6 hours in copper caldron, take up, let cool, place in a sack covered close, to lay 24 hours that the pours of the wool may inhale the salts, and be better prepared; then rinse well and shift the liquor from your copper, clean well; fill with clean fair water. If the water is hard boil with bran in a linen bag or sour water and boil.

Pokeberry was used with alum for a purple-red, Elderberry and sumac berries also give purple, Many found these to be too fugitive.

Iron was the mordant often used in homedyeing before other mordants became available. Rusty nails, rusty iron pots, iron shaving from the blacksmith were used. Iron made the colors fast but also saddened the colors, thus producing "drab" "charki" "sad color" "snuff" and "liver", names for early colors.

#### Old time mordants

Some primitive methods are still being used in some areas. Wood ashes still used in Peru.

Early Amerinan colosists used:

salt, vinegar, soda, cream of tartar, lye. "Drip lye" was made at home from wood ashes, and "chameber lye" (urin) was a ready source of ammonia and other salts. Urine was until recently and may still be used in Ireland, Scotland, and many parts of Europe. Male urine was sometimes said to better than female! Sumac galls and oak galls were both used as mordants as well as dyes. The galls on the leaves are caused by an insect whose attack stimulates the tree to excessive growth. Tannin, which is concentrated in the galls, is the mordant.