

# NATURE'S

## Grapevine

WASHINGTON CROSSING STATE PARK, NJ

Autumn 2005

### Natural Dyes

By  
Kent Long



Mankind has been experimenting with and perfecting ways to make dyes for millennia. People's desire to make fabrics as colorful as the world around them gave rise to an art form, which is rich in history. The resources needed for making natural dyes vary from one recipe to the next. Some dyes are very simple and some are very complex. Minerals, plants, insects, and other types of animals have all been used to make dyes. Knowledge of these dye recipes has been passed down from one generation to the next. Over time the art form of natural dyeing has gone through many changes. At one point in history natural dyes were thought to be obsolete by many because of the discovery of synthetic dyes. Some natural dyes are used more today more than they ever were before. Others are no longer used today because they are not commercially viable and difficult to manufacture.

Three dye plants have been commercially very valuable throughout man's history. These dye plants are indigo, madder, and woad, and their dye color is the reason for their value. Dyes that yielded the colors red, blue, and purple were rare and when a source was discovered to produce such colors, it became very sought after. Madder made a brilliant red dye, woad produced various shades of blue, and indigo made distinct purple and blue dyes depending on the recipe. Indigo eventually replaced woad as a commercial dye source. (continued on Page 2)



### The Poem that Made a Difference

This poem, written by Thomas J. Walker of Lambertville, was printed in the Trenton Times on January 25, 1912. The sentiment created by this rhyme was very instrumental in arousing interest from the state legislature to eventually support the creation of Washington Crossing State Park.

#### Washington's Crossing

Why leave unmarked the famous place  
Where Washington once led  
His little band of valiant men,  
Unclothed, unshod, unfed,  
To brave the river's icy snares  
That this great nation live;  
And yet in memory of the deed,  
No meed or honour give?

Save for the name, a moss-clad stone,  
No shaft, nor columns rise;  
And yet no spot in our fair land  
Is more immortalized!  
Is not the greatness of the past,  
The Crossing's cherished fame,  
Enough to build a monument  
All worthy of the name?

Our country's mighty wealth grows on,  
The millions mount apace,  
Yet not a copper, not a flag,  
To designate the place.  
Oh, countrymen, this long neglect  
Is dead, I hope for aye.  
Buy up the land, lay out the walks,  
Our country's own away!



## Volunteer Notes

**Adam Korwin**, Hopewell Twp., and the scouts and adult volunteers of **Troop 1776** replaced our aging bluebird nest boxes with new structures this past summer. For his Eagle Scout project, Adam obtained all the necessary materials and directed the construction of over three dozen new nest boxes by volunteers from his scout troop. Adam then brought his scout group out to the park to mount the boxes on posts in the fields along Brickyard Rd. The boxes are mounted in pairs in order to minimize competition from tree swallows. We wish to thank Adam, his family and Troop 1776 for their hard work and we congratulate them on a job well done.

**Willard Hutchinson**, Lawrenceville, donated a tanned skunk pelt to the Nature Center. The pelt will be used as an educational prop for wildlife and primitive technologies programs.

**Nettie Rekowski**, Ewing, and **Pricilla Damiani**, Ewing, have adopted the Yellow Dot Trail and have been maintaining the trail since January of this year. Nettie came out and spent hours of her time in July cleaning the Nature/Interpretive Center building and organizing the office and storage-work area.

**Jenny Schwing**, Robbinsville, **Terri Miller**, West Trenton, and **Nettie Rekowski** all came out to staff the Nature Center during interpretive Programs.

**Kent Long**, Titusville, donated some 60 hours of volunteer time to the Nature/Interpretive Center over the course of the summer. Kent was engaged in a variety of activities including trail and grounds work, maintenance, visitor services and interpretation and instruction. Kent also authored the enclosed feature article on natural dyes. Kent was employed as a Seasonal Interpretive Specialist here at the Nature Center but he went well beyond the duty of his paid hours with volunteerism.

**Catherine and Chester Urbanski**, Lambertville have been very helpful to the enforcement unit of WCSF, as they have been posting newly acquired state property to inform hikers and hunters of the purchase. As part of an attempt to create a continuous land area in the Sourland Mountains, the Green Acres unit in the DEP has been purchasing land from the Delaware River at Lambertville northeast toward Somerset County. The Urbanskis walk the state property almost daily and also assist with handing out information to the public as well as with litter removal.

✧ *Volunteers are needed for weekend help to staff the Nelson House and the Entrance Booth. The Nelson House is our only interpretive building along the river and it supplies information to visitors about historic events as well as the park in general. The Entrance Booth does not charge a fee at this time but we would like to place someone there to disseminate information. Both positions have flexible hours and would only be required on fair weather days.*

✧ *We also could use the services of a volunteer to make some blindfolds*

*for use in our educational programs. If you can sew and you would like to help us out, please call the Nature Center at (609) 737-0609.*

## Beehive Rescued

Visitors to the Nature/Interpretive Center are doubtlessly familiar with our observation honeybee hive. The colony survived the last winter for the first time in years, and did very well through early summer. Then, the bees failed to produce a viable new queen after swarming. As a result, the colony died off and the hive went out of service by the middle of August. In September, beekeeper Bob Krayner of Langhorne came to our aid with a new colony of honeybees and a new queen. The new bees have been installed in the hive and appear to be doing well so far. We are going to attempt to over winter the bees as we did last year by applying a supplemental heat source to the hive. Thank you Mr. Krayner.

**Natural Dyes** (continued) The color Royal Blue got its name because it was such a rare color only royalty could afford it. In the days of the Roman Empire, only people of great power and wealth wore robes of purple. Thus, originated the saying "born to the purple," which referred to someone born into a wealthy or well-to-do family. In the late 1700s early 1800s bureaucrats used tape made with a fabric that was dyed red to bundle official documents. The expression "cut through the red tape" came about because of the tediousness of untying and tying back up such papers in order to obtain information.

Washington Crossing State Park is famous for the historic events that took place there during the Revolutionary War. Washington and his army crossed the Delaware River, into New Jersey, on Christmas night to attack the Hessians in the city of Trenton. Most of Washington's soldiers did not have the blue Continental Army uniforms of the time but some did, and they were dyed with Indigo and woad. Some of Washington's soldiers took stolen red and gold British uniforms dyed over them with a blue dye creating uniforms of brown and green. The British soldiers, nicknamed "redcoats" had uniforms dyed with madder.

The earliest written record of the use of dyes can be traced back to 2600 BC in China. Ancient tombs in Egypt have contained mummies wrapped in fabrics that were naturally dyed. In 715 BC wool dyeing was established as a craft in Rome. In 331 BC, Alexander the Great found 190 year old purple robes when he conquered Susa, the Persian capital. The robes were in the royal Persian treasury and were said to be worth the equivalent of six million dollars today. Alexander also made mention, in the year 327 BC, of the "beautiful printed cottons" in India. Late 4th century Emperor Theodosius of Byzantium issued a decree forbidding the use of certain shades of purple except by the imperial family on pain of death. In the 1200s Rucellia of Florence, rediscovered the ancient art of making purple dye from lichens sent from Asia Minor. Brazilwood was used as a dye in 1321 and the country was named for the wood found there. (*continued next page*)



In the 15th century, Aztecs under Montezuma conquered the Mayans and 11 Mayan cities had to pay a yearly tribute of 2000 decorated cotton blankets and 40 cloth bags dyed with the cochineal insect. In 1464 Pope Paul II introduced, "Cardinals Purple" which was really scarlet. This dye came from the kermes insect and became the first luxury dye of the Middle Ages just as Imperial Purple had been for the ancient world. In 1856 William Henry Perkins discovered the first synthetic dye while trying to find a cure for malaria. This discovery changed the dye making trade from an art form into a science. People stopped looking for natural dyeing resources and started to use chemicals.

### Dyeing Mechanics

Natural dyeing requires four steps – washing the fabric, adding the mordant, dyeing, and rinsing. Washing the material is necessary to remove dirt and oil, which will hinder the dyeing process. Wool for example, contains lanolin, which must be removed from the yarn before dyeing. After a good soaking and lathering in soap water the fabric should be rinsed with fresh water with a trace of vinegar until all the suds are gone. The application of a mordant fixes the pigment in the dye to the fabric. A mordant is a chemical, usually a metallic complex or salt that reacts with both the dye and the fabric and serves as a sort of glue to make the color permanent. If a mordant is not used many natural dyes will fade and bleed when the dyed article is washed. Alum, potassium dichromate, copperas, copper sulfate, cream of tartar, and tannic acid are just some mordants one might use. Mordants usually affect the color in some way and a single dye used with different mordants will often bring about different results. For example, I discovered that wool dyed with cochineal on alum produced maroon or purple yarn whereas, the same dye mordanted with cream of tartar resulted in a much brighter red tending toward scarlet. Mordants are commonly applied to the fabric before the fabric is dyed.



Goldenrod



Jewelweed (Spotted Touch-me-not)

Dyeing and rinsing the fabric are the final steps in the natural dyeing process. The material is simmered in the dye bath for the required amount of time, which is different from one dye recipe to the next. It is important to not allow the bath to boil because the extreme heat will destroy many natural dye pigments. When the material has simmered in the dye bath for the required amount of time it is ready for rinsing. The best way to rinse is to start with fresh water that is the same temperature as the dye bath and to gradually decrease the rinse temperature by adding progressively cooler water to the rinse. Once all four steps are completed and the material is dry, the color emerges.

### Local Dye Plants

Natural dyeing is one of the nature self-sufficiency skills offered to visitors at the WCSP Nature/Interpretive Center. This past summer I had the opportunity to experiment with various natural dyes for the purpose of conducting interpretive programs, for several groups of children and their adult chaperones. WCSP harbors many plants, some fungi and an occasional insect, which are capable of producing pigments useful in dyeing natural fabrics like wool, cotton and linen. Some natural dye recipes can be quite esoteric calling for bizarre ingredients such as blood, glandular secretions and excretions from specific species of livestock and other animals. Some require alterations of the pH of the dye bath and some dyes, such as indigo, need to be alternately reduced and re-oxidized. However, many of our local plants will give up their pigments by simply simmering them with the fabric in an enameled pot of water with a mordant for 20-30 minutes. A pinch or two of alum is a good general mordant, which works well for most of these dyes and only minimally impacts the resulting color. *(Continued next page)*

Many useful dye plants are common and even weedy in certain locations around WCSP. Of course, they should be harvested respectfully and in moderation so as to avoid over-picking and eliminating them from any area. Bear in mind that it is against the law to harvest wild plants (excepting edible berries) in state parks and state forests in New Jersey without permission from the park administration. Black walnut is one of the best local dye plants. The pulpy green hulls of the nuts, when crushed and exposed to the air, will oxidize into a rich chocolate-brown that will dye wool various shades of yellow, tan and brown depending on the length of time the fabric is left in the dye pot.



Black Walnut

Black walnut hulls are such a good source of natural dye that they require no mordant at all, and they can be found lying on the ground just about everywhere in late summer and autumn. The berry dyes are useful for obtaining shades of pink, red, purple and blue. Wine raspberries, black berries, dewberries, blueberries, mulberries and strawberries mordanted with alum all yields interesting colors. Certain roots such as bloodroot and sassafras produce orange and rusty red respectively. Beware that the bloodroot wildflower is not very common in most locations and is best harvested from the garden where it can be cultivated and managed rather than from the wild. Most of the delicate pigments found in flowers tend to break down in the dye pot rendering them relatively useless for anything but shades of gray and tan. A notable exception to this tendency is goldenrod whose flowers offer a bright and colorfast yellow. The big surprise of the past summer was jewelweed or touch-me-not. The leaves and stems of this plant produced a vibrant orange color for me. Interestingly, the vegetative portions of jewelweed seem to lose their pigments by late summer when they appear to move into the plant's flowers. Seasonality is an important factor when considering dyeing. The same plant species might yield different results when harvested at different times of the year. Onionskins, beets and cranberries are just a few common household items that are useful in natural dye experiments in the home.

Knowing how to make dyes with materials from nature is a skill that has been developed, practiced, and refined throughout history. The next time you visit WCSP, be sure to stop at the Visitor's Center/Museum to view the Revolutionary War uniforms on display and consider what went into their colors. The Nature/Interpretive Center offers a natural dyes program to schools, scouts and other visiting groups. We are also offering a public event in natural dyes on October 8. See the enclosed autumn program schedule for further information. Remember that the materials and steps needed for dyeing fabrics and other objects is an art form and science that brightens our world. 🦋

Kent Long has worked at WCSP for 3 summers. He graduated from Hopewell Valley Central High School and is currently majoring in Environmental Studies at East Stroudsburg University of Pennsylvania. He is an avid runner and movie buff.

## Around the Park

🦋 Filming for the television show "The Amazing Race" took place at WCSP on July 7th. The reality TV program gives contestants (two per team) clues to search for yet, more clues and the team that finds them all first, wins. In its eighth year of production, the two per team contestants can sometimes travel around the world in this race. This season featured a family-of-four event. The families came to the PA side of the Crossing and had to row a costumed reenactor across the Delaware River to grab a US flag off of the NJ side and then row back to get their next clue. Check your local listings for a showing this autumn.

🦋 The Nature/Interpretive Center will be hosting volunteers knowledgeable in a variety of primitive living technologies on October 22. Come out for **Primitive Technologies Day**. See our program schedule for further details.



Archaeologist Bill Schindler (right) demonstrates the hand drill method of fire building at a previous year's Primitive Technologies Day.



# AUTUMN PROGRAMS

## AT THE NATURE/INTERPRETIVE CENTER

*The following is a list of activities being offered through the Nature/Interpretive Center at Washington Crossing State Park in Titusville, New Jersey. Some programs are offered free without registration requirements; some will require a nominal materials charge and/or advanced registration. Attendance is limited and is available on a first-come, first-served basis. All children must be accompanied by an adult. All programs will initially meet at the Nature/Interpretive Center. In the event of inclement weather, some programs might be canceled. It is always advisable to call ahead before coming out. Phone: (609) 737-0609.*

SOLAR OBSERVING ( all ages) Saturday October 1, 1:00 - 3:00 p.m. View magnetic solar storms safely through special filters on two telescopes. Learn how these storms can affect the earth and other interesting facts about our closest star. Free. Clear skies required.

SOLAR OBSERVING ( all ages) Sunday October 2, 1:30 - 3:30 p.m. View magnetic solar storms safely through special filters on two telescopes. Learn how these storms can affect the earth and other interesting facts about our closest star. Free. Clear skies required

NATURAL DYES (all ages) Saturday October 8, 1:00 - 3:00 p.m. Many interesting colors can be derived from plants this time of year. Come out to learn how several of our more common plants can be coaxed to yield dyes for coloring natural fabrics and take home a few samples of your own. Preregistration required. Materials charge: \$1.00 per person.

MUSHROOMS OF THE PARK (all ages) Sunday October 9, 1:30 - 3:30 p.m. Mycologist **Dr. Glenn Freeman** of West Amwell will lead this hike in which participants will explore the park for fungi and learn about these unusual organisms. Advanced registration required. Free.

AUTUMN FOLIAGE HIKE (9 yrs. - adult) Sunday October 16, 1:30 - 4:30 p.m. This is a naturalist-guided 3 1/2 - 5 1/2 mile hike taking on the park's natural and historic areas, and several interesting and remote sections of the park during the onset of the peak fall foliage season. Wear sturdy footwear. Bring drinking water, a snack and a pair of binoculars. Advanced required. Free.

BUILD A ROPE BRIDGE (8 yrs. - adult) Saturday October 22, 1:00 - 3:30 Participants will learn some basic knots and rope riggings which have been used by survivalists for generations. They will then utilize their newfound skills in constructing a suspended rope bridge which will traverse one of the park's stream beds. Advanced registration required. Free.

PRIMITIVE TECHNOLOGIES DAY (all ages) Sunday October 23, 12:00 p.m. - 4:30 p.m. Archaeologists and primitive technologists from throughout the region will be on hand demonstrating and discussing a variety of primitive skills that local Native Americans and Indigenous people from throughout the world practiced in prehistoric times. Free.

**NATURE / INTERPRETIVE CENTER CLOSED Sat. Oct. 29 - Tues. Nov. 1.**

SHELTER BUILDING WILDERNESS SURVIVAL(6 yrs. - adult) Sunday November 6, 1:30 - 3:00 p.m. This program will deal with the fundamentals pertaining to survival when lost in the wild. Participants will construct a weatherproof shelter completely from native materials. Advanced registration required after 10/4. Free.

SHELTER BUILDING WILDERNESS SURVIVAL (6 yrs. - adult) Sunday November 13, 1:30 - 3:00 p.m. This program will deal with the fundamentals pertaining to survival when lost in the wild. Participants will construct a weatherproof shelter completely from native materials. Advanced registration required after 10/4. Free.

FAMILY SCAVENGER HUNT (all ages) Sunday November 20, 1:30 - 4:00 p.m. Families and individuals will attempt to locate various natural objects in the park and obtain information about the area as they compete against themselves or others in this fun traditional game. Advanced registration required after 10/18. Free.

**NATURE / INTERPRETIVE CENTER CLOSED Thurs. Nov. 25 - Tues. Nov. 29.**

PLATFORM BIRD FEEDERS (6 - 11 yrs.) Sunday December 4, 1:30 - 3:30 p.m. Build a rustic hanging bird feeder from plywood and cedar boughs that will serve a variety of winter bird species. Bring your own hammer. Advanced registration required after 11/2. Materials charge: \$3.00 per feeder.

HOLIDAY WREATH MAKING (all ages) Saturday December 10, 1:00 - 3:30 p.m. Participants will learn how to identify several species of evergreens and use clippings from these plants to construct holiday wreaths. Preregistration required after 11/8. Materials charge: \$8.00 per wreath

**NATURE / INTERPRETIVE CENTER CLOSED Sat. Dec. 24, 2005 - Tues. January 3, 2006**



## AUTUMN PROGRAMS AT THE VISITOR CENTER/ MUSEUM

Call (609) 737-9303

HISTORY VIDEO - "POWS OF THE AMERICAN REVOLUTION." Saturday October 1, 2:00 p.m.. This 70-minute video tells the story of the American Prisoners held in the New York prison ships in Wallabout Bay.

HISTORY VIDEO - "SPIES OF THE REVOLUTIONARY WAR." Saturday October 8, 2:00 p.m... Nathan Hale, John Honeyman, John Andre and Benedict Arnold are just a few of the spies who played a large role for both the American and British during the American Revolution.

RECREATING THE BATTLES OF TRENTON AND PRINCETON IN A WARGAME. Saturday October 15, 2:00 p.m... The Battles of Trenton and Princeton will be recreated by using miniatures, dice and "Flint & Steel" rules. Visitors can observe and some will be able to participate as the historic military commanders by issuing orders to their military units.

PRESENTATION - MEET TIM MURPHY. Sunday October 16, 1:00 p.m... Stan Sapperstein will perform a one-man play as Tim Murphy, one of America's greatest but forgotten heroes.

HISTORY VIDEO - "JOHN AND ABIGAIL: LOVE AND LIBERTY." Saturday October 22, 2:00 p.m... This 45-minute video discusses the lives of John and Abigail Adams; one of America's greatest couples.

HISTORY VIDEO - "FOUNDING MOTHERS WITH COKIE ROBERTS." Saturday October 29, 2:00 p.m... This 50-minute video tells the incredible stories of the women who actually saw combat to the moral and legal victories of Elizabeth Freeman, a slave who sued for freedom.

LECTURE - "THE CHRISTMAS NIGHT CROSSING AND THE BATTLE OF TRENTON." Saturday December 17, 2:00 p.m. Using diaries and letters of the participants, Resource Interpretive Specialist Mark Sirak will give a lecture on the significance of the Christmas Night Crossing and the Battle of Trenton.

THE CHRISTMAS DAY CROSSING REENACTMENT. Sunday December 25, 1:00 p.m... Commemorate the 229th anniversary of George Washington's famous Christmas Night crossing of the Delaware River by viewing the annual reenactment.

# AUTUMN PROGRAMS AT THE JOHNSON FERRY HOUSE

Call (609) 737-2515

FALL FOODWAYS Saturday October 8, 11:00 a.m. - 4:00 p.m. This demonstration will focus on preparing the plentiful produce from the garden. Free.

THE FIRST THANKSGIVING -  
HISTORIC FOODWAYS CLASS This participatory event will feature Native American and Elizabethan English foods. Materials charge: \$40.00.

LANTERN WALKING TOURS. Friday December 23, 6:45 p.m. and 7:15 p.m.. Guided tour of the Nelson House, Harvey Barn and the Johnson Ferry House. Registration required. Fee: Adults \$ 5.00, Children \$ 3.00. Please call 609-737-2515.



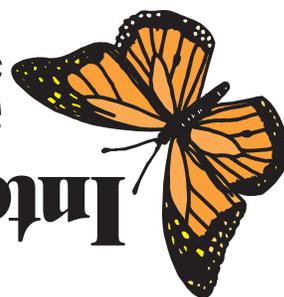


New Jersey Department of Environmental Protection



WASHINGTON CROSSING STATE PARK  
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Titusville, New Jersey 08560-1617

**Interpretive**  
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Nature's Grapevine is produced quarterly by:



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