

New Jersey Outdoors

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New Jersey Outdoors

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State of New Jersey



Thomas H. Kean
Governor

Department of Environmental Protection



Robert E. Hughey
Commissioner

Natural Resources Group

Helen C. Fenske
Assistant Commissioner

Resources Interpretive Services

Howard J. Wolf, Director
CN 402, Trenton, NJ 08625
Telephone: (609) 633-2102

New Jersey Outdoors Magazine Staff

Steve Perrone
Editor

Sally Dudley
Special Projects Editor

Contributing Editors
Sharon Ann Wander
Cathie Cush
Carolyn Bevis

Circulation
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NEW JERSEY OUTDOORS CREDO

This publication is dedicated to the wise management and conservation of our natural resources and to the fostering of greater appreciation of the outdoors. The purpose of this publication is to promote proper use and appreciation of our natural, cultural, and recreational resources, and to provide information that will help protect and improve the environment of New Jersey.

(Note: Costs of publishing the magazine not covered by subscriptions are met from general revenues available to the Department of Environmental Protection.)

The views and opinions of authors do not necessarily represent the opinion or policies of the Department of Environmental Protection or the State of New Jersey.

FROM THE EDITOR

Reader Survey Returns

We're still receiving the completed NJO Reader Survey forms printed in our March/April 1985 issue, but it's time to report to you what you've been telling us about *New Jersey Outdoors*.

Your answers to the first question, "What are your favorite interests, hobbies, sports?", reveal that 44% fish, 31% hike, 19% hunt, 19% are campers, 14% are gardeners, 16% like boating, 13% like photography, 6% like skiing, 8% are cyclists, and 1% like scuba diving.

Question 4: "How long have you been reading *New Jersey Outdoors*? Your answers: less than a year—9%; 1 to 2 years—20%; 3 to 5 years—35%; 6 to 10 years—17%, and over 10 years—18%.

Question 7: "Do you think NJO is succeeding in its efforts to inform and educate the people of New Jersey about our environmental concerns and the conservation of our natural resources?" The "Yes" response was 91%. This response has been steady at about 90% for all four NJO surveys over the past 9 or 10 years.

Question 6: "Which of the following attracts your interest first?" The responses are: 46%—recreational articles (camping, hiking, boating, etc.); 13%—editorials; 34%—parks; 30%—pictorial essays; 43%—nature study; 36%—historical articles; 44%—fishing & hunting articles; and 30%—environmental education.

Because we do not have enough space on our editorial page to discuss all the Reader Survey responses, we will make copies of the survey tabulations available to all interested readers. To receive a copy, please send a self-addressed stamped envelope to the following address:

New Jersey Outdoors
Reader Survey
CN 402
Trenton, N.J. 08625

Steve Perrone

IN THIS ISSUE

The Revolution Revisited by Mark Edward Lender acquaints us with the major role New Jersey played in the War for Independence. The author is Editor of *New Jersey History* magazine.

Christmas Past by Patricia Reardon locates and discusses the various Christmas festivals to be held at many historic sites and state parks in New Jersey during the month of December.

Steven K. Brush describes a planned holiday walk for the family at Monmouth Battlefield State Park in the article titled, *To Monmouth for a Holiday Walk*.

In the article titled, *Something Old, Something New*, author Scott McGonigle discusses the successful marriage of an old firearm, muzzle-loaders, and a new season.

Old Man, Old Buck, by Gary Yaker, is a story that reveals the reverence and

respect an old hunter has for wildlife.

The Indians named the wild cranberry, Sasemineash and believed it got its deep red color from blood. That's what author Cornelius Hogenbirk writes in the article, *Birth of a Cranberry Bog*.

Delicious nutrition from New Jersey's marshlands—that's *Wild Rice*, according to the Cook College student authors.

Halley's Comet Returns, by Helen Collins, discusses the return of the comet and the places it can be viewed. The comet last appeared in 1910.

You can enjoy birdwatching this winter without getting frostbite. Read *Indoor Birding* by Billie Jo Hance.

Extremely large freshwater fish have been caught by New Jersey anglers *Fishing for Pike, Pickerel and Muskie*. Biologist Robert Steward discusses the introduction of tiger muskies and northern pike to New Jersey waters.

The secret to *Enjoying New Jersey's Winters* is dressing in layers and keeping your head covered. Author Kenneth W. Dahse tells us how.


The Carol Decker painting on the inside back cover introduces the Wildlife in New Jersey article, *Mice*, by Mimi Dunne. Ms. Decker also provided the sketches on page 36.

As a public service we are reprinting the New Jersey waterfowl stamp on our back cover to remind you that the numbered and signed print of the stamp will be available up to November 15, 1985. The mallards in flight were painted by David Maass, one of the nation's best known wildlife artists. We want to make sure you don't let this date slip by and then it will be too late to buy the print at the issue price.

For all information on where, how, and other information on the waterfowl stamp, turn to page 13.



*The
Revolution Revisited*



BY MARK EDWARD LENDER

The War for Independence swept into New Jersey on November 20, 1776. Leading some 6,000 men, General Charles Cornwallis crossed the Hudson River from Manhattan, climbed a rocky trail up the Palisades, overran Fort Lee, and launched the invasion that drove Washington across the state and into Pennsylvania by early December. The shock of the British assault went deep. From that point until the end of the war the state was an active military theater, scene of countless skirmishes and raids, and of some of the toughest battles of the entire conflict. When the guns were silent, which was not often, the Garden State was a chief encampment and supply area for Washington's troops; for over seven years, the military was a fact of life for local inhabitants. New Jersey surely was, as historians later called it, "the cockpit of the Revolution."

Over two hundred years later, New Jersey is a vastly different place. Many of the sites that hosted events of considerable importance during the war are gone now or changed beyond all recognition. Yet a surprising number of Revolutionary landmarks have survived both time and development. Virtually all sections of the state have something to offer, and visitors can trace highlights of New Jersey's Revolutionary heritage by following the 1776 route of the invading British army.

Start in Fort Lee which anchors the New Jersey end of the George Washington Bridge and near which the Palisades assault path of the British can still be seen. The town itself is densely populated, and the area bears little resemblance to the battleground of 1776. But at Fort Lee Historic Park, a visitors' center explains the British assault, which left patriot General Nathanael Greene barely enough time to evacuate the continental strong point. Cornwallis' men poured into the works in time to capture a number of rebel stragglers.

Next, take the New Jersey Turnpike south to New Brunswick, where the patriot army retreated after the Fort Lee disaster. Home of Rutgers, one of the original colonial colleges and now the state university, New Brunswick saw considerable action in 1776 and 1777. Near Rutgers' picturesque administration building, Old Queens, a marker indicates where young Alexander Hamilton commanded an artillery battery, holding the British temporarily at the Raritan River while Washington moved south again toward the Delaware.

The territory around New Brunswick is also rich in its Revolutionary heritage, and a number of colonial homes are still in good repair and open to the public. Worth seeing are Buccleuch Mansion, home of cavalryman Anthony Walton White, and across the Raritan in Piscataway, the Cornelius Lowe House, the sole surviving building of the colonial town of Raritan Landing. Just east of the Lowe House on Route 18 is East Jersey Old Town, a village composed of colonial and Revolutionary structures moved from other central New Jersey locations (often to save them from the wreckers' ball). A number of Old Town's buildings

Atop the Palisades a brigade drills in a reenactment at Fort Lee Historic Park.



PAUL J. TAYLOR

The Indian King Tavern in Haddonfield was a meeting place for the N.J. legislature in 1777.

The oak where the wounded General Hugh Mercer lay dying still casts its shadow on Princeton Battlefield State Park.

GREG JOHNSON



have been restored and given period furnishings, and the Indian Queen Tavern, once host to John Adams and other Founding Fathers, is worth a special visit. The furnishings are not original to the building, but many pieces are in superb condition and the restored interior offers a feeling for the workings of the colonial tavern, one of the most important social institutions of the era.

Across the Delaware

In early December, when Washington led his men to temporary safety on the Pennsylvania side of the Delaware, the patriot cause was sinking fast. The fate of the Revolution hung in the balance as the Continentals recrossed the river on Christmas night to strike the unsuspecting enemy garrison in Trenton. The Johnson Ferry House, where the general took up temporary headquarters during the crossing, still stands on the New Jersey river bank in Washington Crossing State Park, straddling Route 29 in Titusville. Now restored, the Ferry House marks the beginning of "Continental Lane," the original route of the advance on Trenton. The modern visitors center at Washington Crossing features the Swan collection of Revolutionary War weapons, documents and memorabilia, and a brief film on the Battle of Trenton. For anyone unfamiliar with that clash, a stop at the park will be well worthwhile before proceeding to Trenton itself.

Follow Route 29 south to Trenton (not Washington's route, but close to it and easiest by car), and drive to the Battle Monument at the intersection of Broad and Warren Streets. The tower, with elevator service to an observation platform, is over 150 feet high and marks the site from which Continental artillery pounded the surprised garrison. The British lost almost a thousand prisoners and, temporarily, the military initiative. Washington's victory ultimately forced the enemy to give up most of New Jersey, and provided a much-needed boost for rebel morale. Handsome bronze plaques by sculptor Thomas Eakins, depicting scenes from the battle are on the base of the monument. The originals are now on display in the New Jersey State Museum on West State Street. Close by the museum are the Old Barracks, a handsome stone structure built during the French and Indian Wars and used during the Revolution by both British and American forces. They are the best such buildings anywhere, and a nominal entry fee brings an interesting tour.

On to Princeton

After another clash at Trenton on January 2, 1777, Washington struck again at Princeton on January 3, some 12 miles north on Route 583. It was not a long fight, but the Continentals drove some good British regiments from the field, much of which remains intact along Route 583/Mercer Street (after rebel General Hugh Mercer, killed in the battle). The Princeton Battlefield Monument commemorates the battle, and a good deal of the surrounding area is now part of Princeton

Battlefield State Park. The park also features the Thomas Clark House, in which General Mercer died of his wounds. The original section of the house remains much the same as it was in 1777, and six rooms with period furnishings are open to the public.

In town, rebel artillery forced the surrender of other enemy troops holed up in Princeton University's Nassau Hall. It is an impressive building, and Princeton students regularly take visitors through. The environs of Princeton are also worth exploring: a number of beautifully restored homes dating from the colonial period are on nearby roads, including Morven, built by Richard Stockton, one of New Jersey's signers of the Declaration of Independence (65 Stockton Street). Another important home, Rockingham, is close by in Rocky Hill; take either Route 27 or 206 from Princeton, and turn onto Route 518 in Rocky Hill. Rockingham, also called the Berrien Mansion after its Revolutionary owner, served as Washington's headquarters in 1783. Congress, then sitting in Princeton, rented the mansion for the general's use, and it was there that he composed his famous "Farewell Address to the Armies." Given to the state in 1935 and restored in the 1960's, Rockingham is open to the public.

The Military Capital

The next stop is Morristown, where Washington found a haven after Princeton (follow Route 206 north and then Route 287 north). Actually, the Continental army spend three winters here, including the most brutal of the war in 1779-80, when troops endured privation far beyond their miseries at Valley Forge. Morristown National Historical Park administers over 900 acres comprising one of the nation's most impressive Revolutionary sites. Start with a visit to the Ford Mansion on Morris Avenue, which served as Washington's Headquarters in 1779-80 and has been faithfully restored. Just behind the mansion is a small but excellent museum, which shares quarters with a superb library. Not far away is the site of Fort Mifflin, an earthwork constructed in 1777, off of Western Avenue. An explanatory tablet marks the hill-top position which affords a scenic view of the town. Jockey Hollow, the main army encampment, lies three miles south on Western Avenue and is a picturesque island of wooded hills and grassy fields in the middle of a rapidly developing region. A visitors center, reconstructed army huts, the Wick House and farm, and well-marked sites and trails offer rare opportunities to explore the state's—and the nation's—Revolutionary past.

South to the Watchungs

After the Morristown winter of 1776-77, the war moved south. The British had wintered between Perth Amboy and New Brunswick, where a savage campaign of small-scale raids and skirmishes centered on rebel efforts to deny the British intelligence and forage from the rest of the state. The actions, however small, also allowed Washington to season his

new Continental outfits for the coming campaign. In April 1777, the Commander-in-Chief sent advance units to positions around Middlebrook in the Watchung Mountains, to keep an eye on General William Howe's men in New Brunswick and in May he shifted the main army there.

To reach the Watchungs from Morristown, take Route 287 south to Route 22 east, picking up Voessler Avenue near Bound Brook. Washington camped his men at strategic locations here, overlooking the region south to New Brunswick and guarding the approaches north, lest the redcoats strike toward Morristown. Most of the 1777 campsites, however, were temporary and visible remains are few. Still, the woods offer some pleasant walking, and at Green Brook on First Watchung Mountain, Washington Rock State Park provides a superb view of the plain below. Tradition has it that Washington watched British troops maneuvering from one particularly good vantage point, marked with a small monument today.

The towns just below the Watchungs hold a rich legacy of the Revolutionary years. There are over 40 pre-Revolutionary buildings in the Somerville, Scotch Plains, and Westfield areas alone, most of them easily accessible from Routes 22 and 28. Westfield has the Miller-Cory House, which dates from 1740 and remains open as a living museum of early American farm life. The Scotch Plains Public Library sells a guide to the old structures there (which are still private homes, but well worth seeing, if only from the outside), while Somerville offers two state-owned historic gems located conveniently across from one another on Washington Place. The first is the Old Dutch Parsonage, which the Dutch Reformed Church erected in 1751. The resident minister during the War for Independence, the Rev. Jacob Frelinghuysen, visited occasionally with George and Martha Washington when they stayed across the street at the Wallace House. Owned by Philadelphia merchant John Wallace, the Wallace House was Washington's headquarters between January and June 1779 during the Continental Army's second encampment at Middlebrook. Restored by a local historical society and conveyed to the state in 1946, the house now features a museum devoted to the Revolutionary era.

In spring of 1777, Washington's use of the Middlebrook positions began to work in his favor. He played cat-and-mouse with Howe daring the British commander to attack the Watchung heights and offering the redcoats no chance for a showdown battle. Frustrated with patriot tactics, and wanting to get on with his attack on Philadelphia, Howe abandoned the state in late June and went to Pennsylvania by sea.

The British Take Philadelphia

The 1777 campaign turned out to be a bloody and drawn-out affair. Howe finally took Philadelphia, but not without a series of costly engagements. One of the bitterest was a ghast-



PAUL J. TAYLOR



PAUL J. TAYLOR

Revolutionary enthusiasts reenact the Battle of Monmouth each June.

ly repulse of British assault at Fort Mercer in Red Bank, Gloucester County (now a 20-acre park). The rebel militia bungled the pursuit, and the mauled Hessians were able to rest briefly at Haddonfield before regrouping and pulling back to Philadelphia.

While there are no signs of this ill-fated march left in Haddonfield, the town remains a favorite of those interested in historic preservation. A special historic district has buildings from virtually all American periods, with the Indian King Tavern as the centerpiece on 233 Kings Highway. Constructed about 1750, and much altered over the years, the Indian King served as a tavern, inn, and also as a temporary State House. The Legislature met here for several months in 1777 when the fighting in the northern part of the state threatened the security of the patriot government. Indian King also made a more indirect contribution to the political affairs of the young republic: the inn-keeper's niece was one Dolly Payne, who, tradition has it, danced more than once in the spacious second-floor ballroom; she was the future wife of President James Madison. Owned by the state since 1903—it was the state's first such historic structure—the old tavern is now open to the public and host to a continuing series of historical and civic functions.

The British invasion of Philadelphia provided the background for two other historically significant state-owned homes. One has a particularly gruesome history. After securing the rebel capital, the British launched a number of raids into New Jersey for forage and intelligence. In March 1778 British officer Colonel Charles Mawhood sent 300 men to surprise an American garrison quartered in the village of Hancock's Bridge. Striking swiftly, the raiders overwhelmed the militia and killed some 30 of them. The Hancock House, however, scene of the tragedy, remained a local landmark and became a State Historic Site in 1931. Restored in the 1970s, it is now open to the public; Hancock's Bridge is about 5 miles south of Salem, an easy drive on a particularly scenic road.

The Longest Day

The British army quit Philadelphia in June 1778. The conflict had widened when France declared openly for the Americans, and the King's troops could not hold the Pennsylvania city if they were to fight on more important fronts. Their retreat across New Jersey to New York brought on the longest single day of fighting of the entire conflict—the Battle of Monmouth. Equipped with new French arms and well-drilled, Washington's men broke camp at Valley Forge and caught up with the redcoats near Freehold on June 28. Firing opened in the morning near the battle monument on Court Street, close to the Monmouth County Historical Association, which has an interesting museum and a wealth of information on the battle. As both sides brought up more units, fighting intensified in a rolling area cut by woods and streams outside of the village. Fortunately, the main battleground has survived virtually intact, and is now Monmouth Battlefield State Park. Follow English-town Road out of Freehold to reach the visitors center, where exhibits explain the day of combat, and how the Continentals finally fought some of the best outfits in the British army to a stand-off by nightfall. The Craig House, home of local militia paymaster John Craig, who saw action that June day, stands on park grounds on Schibanoff Road. Built in 1710, the state has restored it to its eighteenth-century appearance. The Old Tennent Church, used as a hospital during the fighting, and the house that served as British General Henry Clinton's headquarters are close to the battlefield as well.

A Last British Push is Repulsed

A line of historic sites marks the last major fighting in New Jersey. A drive up Morris Avenue/Route 82 from Elizabeth toward Springfield roughly retraces the route of the British as they launched their final serious incursion into the state on June 6, 1780. Washington's main army was up on the Hudson River highlands at the time, and the British may have intended to push all the way to Morristown, where the Continental artillery park lay only lightly defended. During the war years, Eliza-

beth boasted some lovely homes, not the least of which was Boxwood Hall (also called Boudinot Mansion), the residence of Elias Boudinot, one of New Jersey's most prominent patriots and one-time president of the Continental Congress. The house later saw visits from the likes of Washington, Alexander Hamilton, and other political leaders of the young republic. After the initial enemy thrust ended on June 7th, Elizabeth was the scene of considerable skirmishing until the 23rd. Boxwood Hall, however, escaped harm. It is now state-owned, and has been open to the public since 1943.

Moving up Morris Avenue early on June 7th, the invading soldiery passed Liberty Hall, the home of Revolutionary War Governor William Livingston. While still a private residence today the beautiful structure is partially visible from the road and designated by an historic site marker. Union, then known as Connecticut Farms, lies about two miles west, and the British, now facing tough opposition, swept into the town with a vengeance. They burned the church and 14 homes before pulling back. Reinforced, they attached again on the 23rd, this time pushing all the way to Springfield, where the rebels stopped them. It was here that the Rev. James Caldwell, who had lost his wife to an accidental American shot stepped into lasting fame. With patriot troops running short of gun wadding, the fighting parson rode from the Springfield Presbyterian Church tearing pages out of the congregation's Watts hymnals—"Put Watts into them boys!" he supposedly cried.

True or not, the story of Rev. Caldwell captured the patriot spirit that June. While the British briefly took Springfield, and partially burned Caldwell's church, the rebel line held outside of town. The British soon left, and active combat in the northern states, so common since 1775, was over. Reconstructed, the First Presbyterian Church stands today as a reminder of this last major battle on northern soil; and in front of the church, on Route 24, a small plot with a statue on a Minuteman recalls the action. Measured only in square feet, it is probably New Jersey's smallest park.

A full listing of surviving Revolutionary sites in New Jersey would involve a history of much of the War for Independence.

Shippen Manor, in Warren County, for example, is now being restored. The important foundry site of Ringwood Manor is already a beautiful state park. In Bordentown, the Gilder House, with its Revolutionary period furnishings, and Hoagland's Tavern, pillaged by Hessians in 1776, deserve a visit, as does the 1773 Friends' Meeting House in nearby Crosswicks. In Greenwich, site of the Greenwich Tea Party, the Cumberland County Historical Society has arranged an excellent walking tour of early buildings. For the present, it is enough to note that few other states have preserved so much of the Revolutionary era, or offer so many opportunities to appreciate the conditions and ways of life that shaped America at the birth of the republic.

A "Revolutionary" Trail

With the centennial birthday celebration of the Statue of Liberty scheduled for next July 4, there is renewed interest in the birth of this Nation and its history. The Statue of Liberty was a gift from the French people to the new American nation to commemorate its struggle and victory for independence.

New Jersey played a central role in that struggle—the linch pin between the northern and southern colonies. Its loss would have split the colonies, and the war may have been lost. Many significant battles and related activities occurred on New Jersey soil. Because these sites have been carefully preserved, the people of New Jersey can today, some two centuries later, visit these actual places and learn first hand about the events that created this country.

Some 20 historically important sites in New Jersey and in eastern Pennsylvania are identified, described and mapped in a timely publication called "*American Revolutionary Times*." All are within easy driving distance. Developed and produced through efforts of the Council of American Revolutionary Sites—a consortium of historic organizations in New Jersey and eastern Pennsylvania, the *Times* is a chronological presentation of events from July 4, 1776 when Congress approved the Declaration of Independence to November 2, 1783 when George Washington wrote his Farewell Address to the Armies at his headquarters in Rockingham.

The Council hopes to help increase public awareness about the American Revolution and to develop an appreciation of the fact that our Revolutionary heritage is all around us. In addition to the *Times*, a teaching manual has been developed for schools in both states.

For a free copy of the *American Revolutionary Times*, write the Resources Interpretive Services, Department of Environmental Protection, CN 402, Trenton, NJ 08625. Multiple copies are available, but there is a charge of 25 cents each.

In the months ahead you and your family may want to renew your knowledge of this early American history. You are lucky, you can do it here in your own backyard.





ELBERTUS PROL



ELBERTUS PROL



Christmas Past

BY PATRICIA REARDON

Enter the world of Christmas past. No Scrooge will scowl in your direction nor ghost of Marley spoil your visit. Instead, the pleasurable scenes and sounds of earlier Christmases are yours to recapture as you stroll the State's historic sites during December. From simple home to ornate mansion, village church to country inn, members of various Friends of the Parks groups will welcome you to holiday celebrations as they might have taken place in 18th and 19th Century America.

St. Nicholas Day

At Allaire Village in Monmouth County, preparations are already under way for the reenactment of St. Nicholas Day in the year 1823. Festivities will take place on Saturday December 7 when more than 70 costumed volunteers will open the entire village to "live" the holiday in the tradition of yesteryear.

A tour of the village finds us entering one of the brick row houses built to provide homes for resident iron workers and their families. A copper kettle simmers on the hearth and several village women share "a dish of klappern" (gossip). Busy with their needlework, their tongues and fingers fly.

At the village church, the bell is tolling to summon villagers for a carol sing. Pine cone arrangements rest on high window sills, and fresh-cut greens permeate the crisp winter air.

Walking the narrow path to the foreman's cottage, we will note a candle in the window.

An old Irish tradition, the burning taper was said to light the Christ Child's way. The cottage was once the home of John Roach, who, as a boy of 15, arrived on these shores from Ireland, later becoming one of America's foremost shipbuilders.

Stopping by the farmhouse, we would see volunteers engaged in various activities familiar to the former residents, members of the Van Ryst family. As guests enter, Constance Dzenis, dressed in rose muslin, offers a "collation" of punch and sugar cookies. Her son, Michael, tends the fire while daughter, Victoria, arranges platters of delectable "victuals" on the groaning board. Upstairs, Mary Jane Oakes leads us through sunny bedrooms where we find several young ladies embroidering fine linens.

At the post office, the old postmaster will use a special cancellation stamp on Christmas card envelopes brought to him, while along the pathways, St. Nicholas will stop to chat with small groups of visiting children.

On this one special day, no more than 1000 people are permitted to visit the buildings of Allaire Village and entrance is by ticket only. These may be obtained by writing: St. Nicholas, Allaire Village, Allaire, N.J. 07727. Be sure to include four dollars for each ticket and a self-addressed, stamped envelope. Located in Allaire State Park, Wall Township, the village holiday display may be viewed through December. For information call 201-938-2253.



ELBERTUS PROL



With Washington in Somerville

Living history is also the order of the day at Wallace House and Old Dutch Parsonage in Somerville. Here on the Saturday evenings of December 14 and 21, candlelight tours will lead visitors through the residence of 18th century tea merchant, John Wallace, recreating the time that General George Washington was here in December 1778 before leaving to attend Congress in Philadelphia and returning in February, 1779 with his wife, Martha.

Participants in the candlelight tours may sample hot mulled cider, enjoy chamber music, and learn the contra-dance once taught in the colonies by itinerant dancing masters. Dancing, once a highly considered social grace, will take place in the spacious center hallway, its burnished ballustrade entwined in green garland.

On the tour, we will see volunteers baking, cooking, playing cards and games, doing needlework or mending gowns. Ladies may decorate their hair with fresh greens and men will wear sprigs of holly. The rooms will be decked with pine boughs, berries and nuts, with simple centerpieces upon mantles and tables. There will be no Christmas tree in the house since this tradition was not yet fashionable in 1778.

Throughout the month of December, special craft workshops in candle dipping, butter churning, spinning, leatherwork, herbs, and

penmanship will be presented for children and adults. Holiday decorations will remain throughout this period. The two historic sites are located on Washington Place, approximately one-half mile from Somerville Circle. For information call 201-725-1015.

South to Rocky Hill

Just a mile east of Rocky Hill and six miles north of Princeton, the gracious manor house, Rockingham, awaits the arrival of guests for the "Sights and Sounds of Christmas."

It was here that Washington resided in 1783 with his wife, his staff and some of his troops who pitched their tents on the lawn. Here the General entertained Hamilton, Jefferson, Witherspoon, Paine and Madison, and here he composed his "Farewell Address to the Armies."

On Thursday December 12, costumed volunteers will take visitors on the Christmas tour, starting in the white-pine panelled dining room aglow with soft candlelight, sparkling crystal and gleaming silver. The mansion will be lovingly decorated by members of the Stony Brook Garden Club with green boxwood, Queen Ann's Lace, fragrant herbs, pineapples, apples, nuts and dried flower arrangements in the 18th century tradition, and filled with the sound of 18th century chamber music. In the nearby stone kitchen house, "dressy tea" will be served in front of a warm hearth.

Rockingham is located on Route 518 at

A candle lights the window of the foreman's cottage at Allaire Village.

The dining room at Ringwood Manor is all set for a holiday feast.

Traditional greens and a tree are set up each year at the Steuben House in River Edge.

A profusion of poinsettias decorate a stairway at Ringwood Manor.

Rocky Hill. For information and tour reservations, call 609-921-8835.

At Waterloo Village in Sussex County, Christmas is a month-long event commencing on December 1. Each residence and public building will prominently feature a live tree dressed with hand-made ornaments and dried flowers. Poinsettia, fragrant evergreen and grapevine wreaths bedecked with baby's breath and velvet ribbon welcome the many holiday visitors to this once bustling stop along the Morris Canal.

Restored Waterloo appears today much as it was during the early 19th century. General Store, Stagecoach Inn, Towpath Tavern, Canal House, Weaving Barn, Saw Mill, Gristmill, and various 19th century residences comprise this historic site along the banks of the Musconetcong River.

On December weekends, the frosty air echoes the music of strolling carolers, bell-ringers, and tunes of the fife and drum corps. At Wellington House, elaborate antique ornaments and decorative arrangements recall Christmas in Victorian times while at the more rustic Tavern, plain wooden tables hold simple pine cone arrangements cradled in evergreen. Candles reflect on copper kettles and burnished pots. In a massive stone fireplace, crackling logs and kindling warm chilly guests arriving from outdoors. As a gingham-gowned barmaid takes orders for cider, wine and cheese, a strolling guitarist urges guests to join in the merry singing. Upstairs at the General Store visitors may browse through a feast of holiday gifts, all of them made by hand in the Village.

Waterloo Village in Allamuchy State Park, Stanhope, is open through December 30 (except Christmas Day) Tuesday through Sunday. For information call 201-347-0900.

A Victorian Christmas

Spacious and rambling, graceful Ringwood Manor in upper Passaic County presents the perfect setting for an annual Victorian Christmas display of grand and elegant proportions. First presented in 1972, and created by the Woman's Club of West Milford and co-sponsored by the Ringwood Manor Citizen's Advisory Committee, many consider the exhibit the most extensive and well constructed in the area.

Built by Abram S. Hewitt—America's foremost 19th century iron master and son-in-law of New York philanthropist, Peter Cooper—Ringwood Manor houses artwork, fine furnishings, china, crystal and silver of the kind that might have been found in wealthy homes of the period.

For six days in December, the manor doors will be open wide for visitors. Small clusters of guests will be led by hostesses in Victorian costume as they move through the magnificent wood-panelled Great Hall banked with red poinsettia. In the French drawing room, a lavish Christmas tree surrounded by antique toys and bedecked with a vast array of antique bells, angels and blown-glass balls, will fill the bow window with light.

In the cherry-panelled dining room, the table will be set for a winter banquet. Fine

china and crystal will reflect the glow of silver candleabras casting soft light on an ornate centerpiece of fruit, nuts, holly and berries. Sideboards offer an abundance of cakes, cookies, sweetmeats and holiday breads. From the Music Room, the gentle sound of the old pump organ wends its way merrily through the house.

For these few days, the west porch solarium will be converted into a "boutique" for locally made hand-crafted decorations and other items.

The Manor in Ringwood State Park is convenient to Route 23 or Route 17. The Christmas tours will take place on December 7, 8, 11, 12, 14 and 15. For reservations and further information, call 201-962-7031.

Through the Ages in Bergen County

A steady stream of visitors tour Steuben House in River Edge, Bergen County throughout December to view the annual holiday exhibit tracing the evolution of Christmas from ancient to modern times. The display is an education as well as a delight to the eye.

Each year curator Kevin Wright, his wife, Deborah, and Josephine Dolan, use historic sources to recreate decorations that reach back over 15 centuries to the celebration of winter solstice.

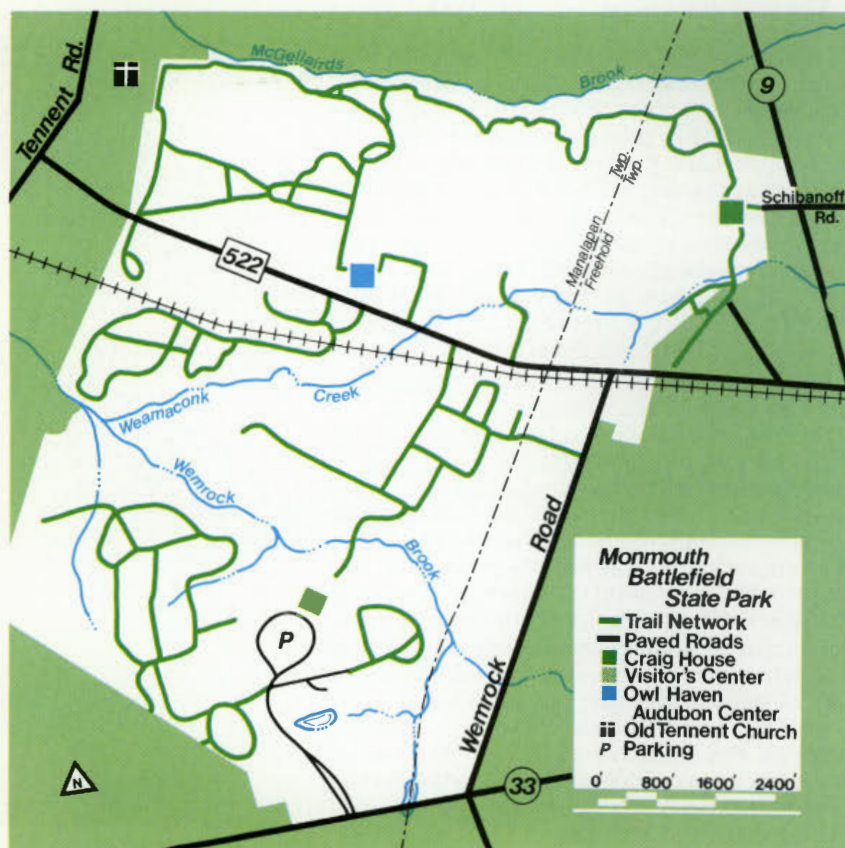
Christian imagery overlaps and meshes with ancient symbols—sacred mistletoe, the Druidic all-healing plant, cut with a gold or silver knife; the suspended kissing bough with apples representing the five planets visible to the naked eye; the wreath of holly and ivy representing male and female; greens for the survival of life in the midst of winter; the red glow of fire for the reappearance of the sun. On St. Nicholas Eve, wooden shoes (precursor to the more familiar Christmas stocking) filled with carrots and straw for the Saint's horse, will be set on the hearth. In the morning, good little children will be delighted to find these exchanged for fruits and treats.

On three special December evenings, the historic house will resound with the music of hammered dulcimer, fiddle, guitar, harp and cello as the Linda Russell Quintet makes merry with folk ballads, old carols, jigs and reels. Guests will be treated to a demonstration of the "limberjack," an early rhythm instrument in the shape of a dancing wooden man which the player pounds with her fist while singing along.

Steuben House is open year-round Wednesday through Sunday. Entrance to the three evenings of candlelight concerts and tours is by reservation only. For dates and times, call 201-487-1739.

The Christmas season is a time for rejoicing and remembering. Through the re-creation of Christmas past, we may recall for a brief moment the rich traditions of our ancestors even while we invent new ones for future generations. The red-nosed "Rudolph" guiding jolly Santa Claus will take his place beside St. Nicholas and his horse just as the Christmas stocking and the wooden shoes. Once again we may recall Charles Dickens' *Christmas Carol* and the immortal words of Tiny Tim, "God bless us, every one."

To Monmouth for a Holiday Walk



BY STEVEN K. BRUSH

When my family gathers each year for Christmas, we renew a practice which is second only to gift-giving in seasonal tradition. After breakfast on the big day we set out into the brisk air and quiet woods for a few hours of hiking. Even if some members of the family have not trodden a trail all year, come the holiday and they will be with us tramping about some Jersey swamp or hillside.

The place we hike this year could be Monmouth Battlefield State Park in Freehold. The park comprises 1600 acres of rolling fields and wooded, wet ravines. More than 25 miles of trails lead through a variety of habitats from rich forest and floodplain to scrubby second growth and active farmland. In park buildings, displays on the area's history and wildlife complement the outdoor experience.

The best way to get a feel for what Monmouth Battlefield has to offer is to start out in the red brick and concrete-vaulted Visitors Center. (Since the Center is closed on major holidays, you'll probably want to stop by sometime before you set out on a holiday walk.) From an elevated vantage point it affords a good view over the park. The farthest treeline is just within the northern boundary. A brochure of the park and a map of the trails, available at the desk, are a necessity for exploring the backcountry.

While you are at the Center, though, you may want to walk through the audiovisual,

historical program about the Battle of Monmouth and its significance in the fight for independence. It will take from 30 minutes to an hour. When I visited last summer, I learned that the Battle of Monmouth occurred when General Washington intercepted the British army on June 28, 1778 as it withdrew from Philadelphia to New York City. The British had dominated the field of battle for the first two years of the war. The Americans had just spent a harsh winter at Valley Forge. However, the training which Washington's army had received under Prussian Baron Frederick von Steuben stood them in good stead when they engaged the redcoats between Monmouth Court House (Freehold) and Tennent. The day ended in a tactical stalemate, but the Americans could claim a three to two advantage in casualties inflicted. When the British fled early the next morning for Sandy Hook to sail for New York, the Americans flew their flag in victory over these fields.

As you look north from the Center, the scene of battle is before you. The armies maneuvered across the open fields, utilizing the uplands between Wemrock Brook at the foot of the hill and Weamaconk Creek. They crossed Weamaconk (in the wooded ravine in the middle distance) on a road bridge called the West Morass Causeway, near present day Route 522. Artillery fired from the hills, including the one on which you are standing.

A Walk Through Fields

After pondering one of the struggles that established our freedom from Great Britain, you have a number of options for exploring the park on foot. Depending on how far you want to go, you can custom-tailor your excursion. Short walks can be taken on the red gravel path that circles the area around the Visitor Center. Trails into woods and overgrown fields branch off the gravel path at several points. The "YCC" trail, built by the Youth Conservation Corps, is one of the better routes.

Directly down the hill in front of the Center, a trail crosses Wemrock Brook and its floodplain on a boardwalk. Up the hill on the other side, the trail connects with a network of mowed swaths through old fields, woods roads and dirt roads alongside fields. Be warned about the trails here—most are unmarked and it's easy to become turned around in your directions. A compass would be helpful to use with the park maps. The other difficulty you will experience hiking is the same as that faced by the armies 200 years ago—crossing Wemrock Brook and Weamaconk Creek. Crossings are at a limited number of locations and traversing the park requires roundabout routes. Driving around it and parking at trail junctions may be the best solution.

By the time you crossed Wemrock Brook you may have begun wondering what fields of crops are doing in a state park. About one-quarter of the area of the park is under cultivation. One field was in soybeans this summer, the northern section in corn and a strip on the east is a neat orchard of apple and peach. Local farmers lease these fields from the state. This practice has done nothing to detract from the park in my estimation. In

fact, access around the field edges is improved. In terms of preserving the historical landscape, this is a practical technique to retain some open, agricultural fields similar in appearance to ones of 200 years ago.

Or Marshes and Woods

There are two other concentrations of trails in the park, both northwest of Weamaconk Creek. Access is best by taking Route 522 west from Route 9 or Wemrock Road to the Division of Parks and Forestry's Region II headquarters in a large, white house on the south side of the road. To reach the marshes, forests and overgrown fields along Weamaconk Creek, take a somewhat overgrown path from the back side of the carriagehouse parking lot and follow it across the railroad tracks. Bear right and you are in a maze of connecting trails through the moist woods near the Weamaconk. Along the creek itself is a marshy strip open to the sky. While deer abound throughout the park, as evidenced by their frequent hoofprints, this west-central section is the only place I actually have seen them—five in one day.

Besides the deep quiet and unspoiled quality of these low-lying marshes, fields and woods, the most interesting aspect of this area of the park is a bowl-shaped depression I found just off one of the trails. Approximately 80 by 100 feet and five to eight feet deep, the basin's gently sloping sides appear to hold water in wet periods because the only growth is herbaceous plants on its floor. Large pin oaks drooping long, lower branches surround this mysterious formation. A possible explanation for the depression would lie in the 19th century agricultural practice of mining the local "greensand," rich in magnesium and iron, for application to sandy loam soils.

Back across Route 522 is Owl Haven in a small house serving as a center operated by New Jersey Audubon Society. During bad weather, or good, its displays of live and stuffed animals can provide another dimension to your trip, especially if you have young trailblazers along. Owl Haven keeps varieties of turtles, owls and snakes for observation. A variety of nature guides is available in the gift shop. The Audubon Society also has established a licensed Raptor Rehabilitation center here, where injured birds of prey are nursed back to health for return to the wild.

Along McGellaird's Brook

From the parking lot of Owl Haven, another complex of trails leads into the north section of Monmouth Battlefield State Park. The trails lead ultimately to McGellaird's Brook on the northern boundary of the park. It is less accessible than some other areas of the park, but well worth exploring. A trail runs east and west along the low bluffs above the brook. Here you walk in the most impressive forest in the park. Yellow poplar (or tulip tree) grows to five feet in diameter. Beech and white ash, red maple, red and white oak and pignut hickory flourish, helping produce the rich, dark humus underfoot. Through it many animals have dug burrows, flinging out the orange subsoil in brilliantly-contrasting heaps. As

you walk the open, colonnaded forest and dip into an unexpected ravine feeding McGellaird's Brook, you come repeatedly to views down to the clear, rippled shallows. On the other side of the water is a broad wetland with willows, rose, greenbriar and grape.

The bluff-top trail at its eastern end winds south to terminate at the Craig House. This 1710 structure at the edge of a large corn field was home to John Craig, the paymaster for the New Jersey Militia in the Revolution. Restored and furnished to give an authentic 18th century appearance, the house is sheathed mostly with round-ended shingles and roofed with wooden shakes. The foundation is made of the heavy chunks of local bog iron. The Craig House is reached most easily by car by turning west off Route 9 at Schibanoff Road and proceeding past the Freehold Township commuter lot for 100 yards down an unpaved lane.

If your interest in history is not flagging, go west on Route 522 to Tennent Road, where a right turn will take you a half-mile to the Old Tennent Church, just outside park boundaries. The Presbyterian congregation for this church had formed in 1692; the building you see was 25 years old by the time of the Battle of Monmouth. The interior design features the pulpit and organ along the side wall, reflecting the New England origins of the founding settlers. Injured soldiers were taken here during the fighting to be attended to. Headstones in the crowded graveyard with dates before and after the Revolutionary War encounter bespeak the church's long history. It continues to be an active church. The bell in the steeple still rings the hours, sounding across the battlefield to the east.

It's not hard to get out for a winter holiday hike once you know its advantages. In the cold weather the crowds of summer are elsewhere, and the landscape takes on a still, almost private, atmosphere. Because Christmas-time brings to mind years past and people gone, you can feel more closely akin to people like John Craig and the buildings or places with which their lives were associated. And, when you return from the exertions of your outdoor ramble, you are quite ready to perform justice at the holiday dinner table.

Whatever your family prefers in outings, you probably will find something to your liking at Monmouth Battlefield State Park. The historically-minded can spend more time at the Visitor Center, the Craig House and, nearby, the Old Tennent Church. Kids will appreciate the animals at Owl Haven. The hiker and nature lover will find, as I did, that the park's backcountry is of a size and quality to sustain repeated visits.

Monmouth Battlefield State Park, Route 33 in Freehold is open for hiking all year. The Visitor Center is open except on major holidays. Hours for the Craig House are limited—inquire at the park office or Visitor Center. For further information, call 201-462-9616.

Owl Haven, Route 522 in Freehold, is open Tuesday through Sunday afternoons. For further information call 201-780-7007.

Duck Stamp Sales will Help Acquire Wetlands

Since the first duck stamps and limited edition prints were sold in 1984, New Jersey has earned over \$600,000 to acquire and manage the state's remaining fragile and valuable wetlands. This issue's back cover features New Jersey's second waterfowl stamp, designed by David Maass, one of the nation's best-known wildlife artists.

The prints are available from local art dealers. Note: The deadline for ordering prints is November 15. To find the dealer nearest you, contact the publisher, MIDWEST Marketing, Sullivan, Ill., 61951, toll free telephone (800) 382-5723.

A N.J. waterfowl stamp is required by law for all waterfowl hunters over 16 years of age. Stamps are valid from July 1, 1985 through June 30, 1986 and come in two denominations, \$2.50 for residents and \$5.00 for non-residents. Only individuals with a valid New Jersey firearm or bow and arrow hunting license may purchase 1985-1986 resident stamps before June 30, 1986.

Collectors may purchase resident (\$2.50) 1985-1986 stamps from July 1, 1986 through December 31, 1986 and non-resident stamps (\$5.00) from July 1, 1985 through December 31, 1986. All unsold 1985-1986 stamps will be destroyed after December 31, 1986.

To Order

Please include a stamped, self-addressed envelope with single stamp orders, a personal check for orders less than \$50 and a bank check or money order for orders over \$50. For resident stamps, a copy of a valid resident license must be enclosed with your order. Make checks payable to the Division of Fish, Game and Wildlife.

Return order form to:

New Jersey Division of Fish, Game and Wildlife

Waterfowl Stamp

CN 400

Trenton, N.J. 08625

	Quantity	Price	Total
Resident Waterfowl Stamp	___	\$ 2.50	___
Non-resident			
Waterfowl Stamp	___	\$ 5.00	___
Resident Plate Block	___	\$ 10.00	___
Non-resident Plate Block	___	\$ 20.00	___
Resident Sheet of 30	___	\$ 75.00	___
Non-resident Sheet of 30	___	\$150.00	___
Total enclosed			___

Name _____

Address _____

City _____ State _____ Zip _____



Something Old, Something New



BY SCOTT MCGONIGLE

Something old and something new, it is said, contributes to a successful marriage. In New Jersey, we have a *new* season with an *old* firearm: muzzleloaders. Since the muzzleloaders were first allowed in 1976, this form of deer hunting has grown rapidly in popularity.

While a number of reasons account for this, the most important is the challenge of putting venison on the table in much the same manner as did our great-grandfathers. Unlike the New Jersey shotgun hunter, and modern rifle hunter in neighboring states, the black-powder hunter has one shot—and only one.

To be successful, he must not only be a proficient shot, but a good woodsman as well. The black-powder hunter must stalk to within 100 yards of his target or wait for the deer to approach within that range, so that his shot will drop the deer.

A Special Season

To compensate for the many difficulties that face the hunter using black powder, the Department of Environmental Protection's Division of Fish, Game and Wildlife has created a special nine-day season that follows the bucks-only shotgun season. The muzzleloader season, like the other seasons that precede it, is a part of the Division's overall plan to keep the New Jersey white-tail deer herd healthy. For this reason it is carefully regulated.

Not everyone who owns a muzzleloader may hunt during the special season. Two permits are required: First, the hunter must obtain a rifle permit which requires attending a hunter-education course that concentrates on safe handling of rifles—both modern and primitive— and the game laws in New Jersey and passing written and field tests.

With this permit the hunter may apply between August 24 and September 9 for a muzzleloader, deer-season permit in the zone of his choice. If successful in a random drawing, the applicant will be informed and required to send in \$10. Those who are not successful may be offered a permit for one of the undersubscribed zones.

There is a logical method to this seeming madness: good deer management. New Jersey is divided into 51 deer-management zones. Not all offer the best hunting. Not all are as populated as others. Not all are even open for the muzzleloader season. By keeping the size of the deer herd in each zone compatible with the amount of suitable habitat, the health of the herd and the amount of damage they cause is controlled. The permit system keeps the number of hunters in balance with the herd.

Despite some drawbacks, black-powder

hunting has some advantages, one of which is cost. A good, modern, black-powder rifle can be purchased new for under \$250, and a kit for even less. Don't bother looking for too many second-hand ones. Once bought, most hunters keep them. Not only do these rifles provide a challenging way to hunt deer, but the brass-trimmed, octagon-barrel guns also look great over the fireplace. And they are a lot of fun for just plain target shooting, too. Many who get into black powder just for deer hunting end up shooting at weekend competitions throughout the state.

One word of caution: if the rifle is to be used for deer hunting it must be .44 caliber or larger. The most popular caliber in New Jersey seems to be the .50. After a month of shopping and comparing, I settled on a Thomson/Center .50 caliber Hawken, and have not regretted it. A number of manufacturers are turning out well-made, competitively priced muzzleloaders.

In addition to the rifle, another \$50 will be needed to buy powder, musket balls, patches, lubricant, percussion caps (or flints), and a powder measure. Unlike Pennsylvania where only flintlock rifles are permitted, New Jersey hunters may use either a flintlock or cap lock.

Of Flintlocks and Frizzen Pans

Where the cap lock uses a small metal cap that fits over a nipple that leads to the charge, the flintlock relies on flint striking the frizzen pan to ignite the main charge.

Many hunters have been disappointed when the shot-of-a-lifetime was lost because of wet powder in the frizzen pan. Although percussion caps are less susceptible to moisture, they should be changed every hour during wet periods; they also can absorb moisture. Likewise, powder for recharging should also be kept dry.

While it may seem nostalgic to wear buckskins when hunting with Dan'l Boone's firearm, nothing could be more foolish—or lethal. In fact, state game laws require hunters to wear a minimum of 200 square-inches of blaze orange. Many hunters wear a camo suit and an orange hat. The hat meets the safety requirements while the camo helps break up the hunter's body outline.

The principal reason for the rapid growth of black-powder is interesting. According to the Division of Fish, Game and Wildlife's *Whitetail Deer Report No. 10*, most of the hunters who participated in the 1983 muzzleloader survey made comments like the following:

"... the quality of the hunting experience was much greater than the shotgun alternative..."
"... a more individualistic and unique hunting experience ..."

Chances of putting venison on the table are slightly above 15 percent according to the report. Of course, that is just a dry statistic. A hunter's chances could be much higher—or lower—depending on how well he knows the area and the habits of whitetails. Naturally, no hunter ever turned down a little luck. That helps, too.

One of the newest hunting seasons has resurrected an old firearm. In doing so, the marriage of the two has brought to the surface some of the deeper reasons why modern man hunts: the one-on-one contest between man and game; a few meals during the year that will not come from beef fattened by chemical supplements; and finally, a chance to wait and listen on a cool autumn morning, observing the calm beauty of the rising sun glimmering through the leafless branches of a gnarled old oak—an oak that could have been a sapling when the first hunter carrying a muzzleloader passed by over 300 years ago.



PHOTOS BY
WARREN GARRETSON

Hunter sitting on Silent Hunter portable stand. Does not damage trees and may be used where permanent tree stands are illegal.

Hunter waits for deer to approach within 100 yards.





A sea of red surrounds workers as they harvest a flooded cranberry bog.

A delicate white cranberry blossom.

PHOTOS BY AUTHOR

Birth of a Cranberry Bog

BY CORNELIUS HOGENBIRK

Sasemineash, that's the name the Indians gave to the wild cranberry they found in the bogs along the streams and creeks of the New Jersey virgin pinelands. They used the crimson berries as medicine, as food, and as a dye together with red ochre. Later, colonial sailors learned that cranberries prevented scurvy (cranberries, as we now know, are rich in vitamin C).

According to a Lenni Lenape myth, the cranberry got its deep red color in a startling fashion. In ancient times the great pre-historic beasts gathered behind the hills, and there they fought. So fierce was this battle that the rivers ran red with blood, overflowing into the swamps and bogs and covering the cranberries, creating their blood-red color.

Today the cranberry is a multimillion-dollar New Jersey crop, grown on about 3000 acres in the counties of Ocean and Burlington in the Pine Barrens. Once it was just used as a tangy sauce to be served with turkey at Thanksgiving, but in the early 1960's Ocean Spray, the nation's largest cranberry cooperative, developed and promoted cranberry juice, soon to be followed by the blended drinks now so familiar on the market shelves. Interestingly, it is the West and Southwest that lead the nation in cranberry consumption.

Cranberries in the state were first cultivated in 1835, it is recorded, when Benjamin Thomas set out plants in a bog near Burr's Mills in Burlington county. Much has changed since then. Handpicking gave way to the cranberry scoop shortly after World War I, reducing the number of field pickers required by

two-thirds. Today the fields are flooded for harvesting, and specialized machinery has been developed to collect and to clean the harvested berries.

The key to a productive cranberry field is an abundant and continual supply of water. The farms south of Chatsworth on Route 563, for example, draw their water from the Wading River. When the fields are drained this water is returned to the river, and some of it seeps through the ground to collect in the Cohansey Aquifer. Little is wasted. So long as humans do not disrupt this water cycle the cranberry will flourish here, as will the Jersey blueberry, which is often grown as a companion crop.

To Grow the Best

Modern cranberry fields require a tremendous amount of cultivation to provide the increased yields that are an economic necessity today. About the time that many of us are getting ready to plant our first tentative rows of beans, when the oak leaves are the size of a squirrel's ear, the bogs are drained of their winter protective cover of water. This is an anxious period for the growers, as an unexpected frost could severely damage the swelling buds and shallow roots. Water is maintained in the ditches surrounding the bogs to reflood if necessary. Some growers now sprinkle the fields with their irrigation systems to keep the temperature above freezing at ground level.

Fertilizer such as 10-10-10 is applied in late June, a modest 10 pounds per acre, about one-fifth of what is needed for the blueberry crops. A fungicide may be applied to prevent leaf drop, as well as an insecticide, one pre-bloom and one post-bloom, to control scale, tipworm, and cranberry fruit worm. Much of this is accomplished through the use of low-flying airplanes. Weed control must also be undertaken whether by means of a tricky-to-use chemical weed killer, or by hand-operated mechanical devices. It is a great deal more complex to operate a cranberry farm now than it was in the days of Benjamin Thomas. Needless to say yields have vastly increased, and the berries themselves have been hybridized to provide richer color and larger size.

Starting from Scratch

Last year in August I witnessed the planting of a new 10-acre bog at the Lee Brothers blueberry farm south of Chatsworth. This farm dates back to 1869 when Stephen Lee's great-grandfather, an Irish immigrant, purchased the land and placed five bogs into cultivation. Today, 60 acres of the farm are planted in cranberries, and 60 in blueberries.

Few people are aware of the tremendous amount of time and labor that it takes to create a new cranberry field. First, a stump-cluttered swamp had to be drained. Dikes were built to hold back the water and allow the field to dry. Then the field was plowed, cleared of stumps and debris, and made as precisely level as possible, so that when flooded the entire 10 acres could be harvested at one time. In the days of hand picking a few feet of variation in bog level was of no importance, but today's water harvesting techniques require a flat field.

The cleanup operation unearthed an immense slab of bog iron, which had to be broken up into smaller pieces before it could be hauled away. At one time this area was the site of a bog iron furnace similar to the one at Batsto that furnished cannon and cannon balls to the Revolutionary Army.

Next, irrigation pipes, sprinklers and a new diesel pump were installed to provide the one inch of water per week required during the growing season. It took two years and approximately 2100 man-hours of labor just to prepare the field for planting.

100,000 Seedlings a Day

And now this new field was finally ready for planting. Each day for five days, busloads of itinerant farm workers were transported from Philadelphia. Many were Cambodian refugees who had fled their homeland during the political turbulence in Southeast Asia following the Vietnam war.

It was interesting to watch these workers as they squatted to press each seedling into the virgin swampland. They moved from spot to spot crablike without pause, or need to stand up for relief. They frequently laughed as they chattered to each other in their native tongue. Others removed trays of seedlings from a flat-bed truck, and preceded the squatting planters. As they walked along a row they separated individual plants from a bunch, and each was skillfully dropped into a machine-punched hole. Each planting spot contained a sprinkling of fertilizer that would release its nutrients over eight to nine months, and when the soil temperature had reached 70°F.

A relatively new cranberry hybrid, Crawley, obtained from a nursery in Oregon, was introduced into this field. It had previously been field tested at the Rutgers Research Center, Cranberry/Blueberry Laboratory near Jenkins Neck.

It took four and a half days to complete the planting of 400,000 seedlings and required 2244 man-hours of labor. It will take yet another two years before the field will be productive. At that time the Lee Brothers hope to see a bounty of rich, red, plump berries hanging heavy on the tiny-leaved, six- to eight-inch vines, as a reward for their efforts. Then this bog, too, will be flooded, and the harvest machine will enter it for the first time to loosen the berries from the vines with its rotating thresher.

The floating berries will be corralled by workers by means of flexible wooden frames, and gathered into a corner of the bog. There they will be scooped into a vertical conveyor, and loaded into 1000-pound wooden crates on waiting trucks.

This is a fascinating operation to witness. The bobbing wet berries sparkle in the sunlight like a pool of rubies. In fact an oft-used nickname for the cranberry is "Rubies of the Pines." Whether it is a tangy, eye-appealing sauce at Thanksgiving or Christmas dinner, or a refreshing, vitamin rich drink throughout the year, the cranberry has its well deserved place. Today's cultivated fruit is a valuable heritage from the past, when only the New Jersey Indians were here to gather the Sasemineash.

Stephen Lee operating water harvesting machine.



CALENDAR OF EVENTS

NOVEMBER

1-Dec. 22 CHRISTMAS AT THE GENERAL STORE, Allaire State Park, Farmingdale 201-938-2371

1, 15, 30 COMET HALLEY PROGRAM, N.J. Astronomical Association, Voorhees State Park, Glen Gardner 201-639-8500

1-Jan. 12 WILDLIFE IN OUR LANDSCAPE: A SPACE FOR ALL SPECIES at the East Brunswick Township Museum on 16 Maple Street. The show will feature New Jersey wildlife including animal displays, wood engravings of waterfowl and mammals, oil and acrylic wildlife paintings, and wooden carvings of birds and fish.

15 HALLEY'S COMET WATCH, Route 563, 12.5 miles south of Chatsworth 609-365-5451

15-Jan. 1 VICTORIAN CHRISTMAS, Lambert Castle Museum, Paterson 201-881-2761

16 HIKE TULPEHOCKEN MARSH, 11 miles. Meet at Carranza Memorial, 6.7 miles south of Tabernacle. 609-859-8160

16, 17 209TH ANNIVERSARY of Washington's retreat from Fort Lee, Fort Lee Historic Park, Fort Lee 201-461-3956

17 HIKE SPRING HILL and the West Plains, 10 miles. Meet on Route 563, .8 mile south of Chatsworth. 609-468-4849

21 PINE BARRENS SLIDE PRESENTATION, Collingswood Library, Collingswood 609-858-0649

24 HIKE SANDY HOOK NATIONAL SEASHORE, 16 miles. 609-665-4969

24 THANKSGIVING CELEBRATION, Miller-Cory Museum, Westfield 201-232-1776

27 FULL MOON HIKE, 6 miles. Meet at Atsion Ranger Station, Route 206, 11 miles south of Red Lion Circle. 609-268-0506

28 GET READY FOR THE TURKEY, 30 mile bike ride. Meet at Mt. Laurel

November 1985						
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December 1985						
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29	30	31				

Municipal Building Library Complex, Moorestown-Mt. Laurel Road. 609-665-4969

29 THANKSGIVING OF YESTERYEAR, The Morris Museum, Morristown 201-538-0454

29-Jan. 5 GRAND CHRISTMAS EXHIBITION, Museum of American Glass at Wheaton Village, Millville 609-825-6800

DECEMBER

1-30 CHRISTMAS AT WATERLOO VILLAGE, Allamuchy State Park, Stanhope 201-347-0900

7 ST. NICHOLAS DAY, Allaire Village, Allaire State Park, Farmingdale 201-938-2371

7, 21, 28 COMET HALLEY PROGRAM N.J. Astronomical Association, Voorhees State Park, Glen Gardner 201-638-8500

7, 8, 14, 15, 21, 22 CHRISTMAS EXPRESS with Santa Claus, Pine Creek Railroad, Allaire State Park, Farmingdale 201-938-2371

7, 8, 11, 12, 14, 15 VICTORIAN CHRISTMAS, Ringwood Manor, Ringwood State Park, Ringwood 201-962-7031

8 CHRISTMAS IN GREENWICH, Cumberland County Historical Society, Greenwich 609-455-4055

12 SIGHTS AND SOUNDS OF CHRISTMAS, Rockingham State Historic Site, Rocky Hill 609-921-8835

13, 20 CANDLELIGHT TOURS, Steuben House State Historic Site, River Edge 201-487-1739

14, 21 CANDLELIGHT TOURS, Wallace House and Old Dutch Parsonage State Historic Sites, Somerville 201-725-1015

21 CHRISTMAS AT SMITHVILLE HIKE, 4 miles. Meet at Smith Mansion, between Route 38 and the Mount Holly-Smithville Road. 609-267-0536

25 REENACTMENT OF DELAWARE CROSSING, Washington Crossing State Park, Titusville 609-737-0623

Wild Rice

BY LEA CURTIS
CHRISTINE LOCANDRO
MARJORIE METLITZ
SCOTT RUHREN
ROSEMARY ZALESKI

When we first investigated wild rice, we had no idea that it grew abundantly in our own state, let alone minutes from the home of one of our groups. Nor had we any idea of the rich history and unique characteristics of this plant. We were to present our findings in our Interesting and Edible Plants Class, taught by Roger Locandro, Dean of Students at Cook College, Rutgers, the State University.

Many people have heard the wild rice (*Zizania aquatica*). Although it has many names, including Indian rice, water oats, water rice, and crazy oats, it is in fact a type of oat and is also the only grain native to North America. The "rice" itself is a smooth, narrow, black seed usually a half-inch long.

Even in November after the grains have fallen and the plants are no longer green, the wild rice is not difficult to spot. Four to ten feet tall with one- to three-foot lance-shaped leaves wild rice has a two-part flower with a brown female part on top and a male part, cluster of many purple blossoms below.

Wild rice grows in still, shallow, fresh to brackish water of ponds, lakes, and river mouths. It favors mucky, peatlike bottoms and is abundant in the Great Lakes and upper Mississippi regions as well as along the Delaware River in New Jersey. This is where we found our specimens, along the edges of a large creek in southern New Jersey.

Although many people have seen wild rice in "long grain and wild rice" combination dishes, we found it to be important in its own right. Waterfowl and other birds of the marshlands eat about 10 percent of the wild rice crop. In fact, it is often planted in wildlife sanctuaries to provide birds with shelter and food.

Another group who appreciated wild rice were the Indians, who ate at least 10 percent of the crop and considered it their principal cereal food as well as a soup thickener, bread flour, and complement to game. The crop was so important that one Indian word for the month of harvest means "wild rice," and one group, the Menamini, derive their name from

manomin, their word for wild rice.

Indians were, and still are, the masters when it comes to harvesting wild rice. The process is difficult and sometimes dangerous, and attempts at commercial harvesting have been largely unsuccessful, although they are improving.

Rice is ready to harvest in late August in New Jersey, but in states where wild rice is an important crop a legal starting date is set to protect the plant. Laws also require that only Indians, using the traditional shallow canoe with six-inch sides can harvest wild rice on public lands. One Indian stands in back and pushes the canoe through the marsh with a 16-foot spruce pole while his partner sits in front bending the plants over the canoe. He strokes the heads so that the ripe grains fall into the canoe, leaving the immature grains still attached for a later harvest. Occasionally ergot, a pink or purple fungus, replaces the grains and often assumes their shape; these infected grains should be avoided.

In the past the Indians dried the grains in the sun, then removed the husks, or chaff, filling a skim-lined hole with wild rice then "danced" on the grains to remove the husks.

Considering the nutritional value (equal to wheat) and good flavor of wild rice, why is it not grown and used more? The plant is very delicate and harvesting by commercial methods is damaging to the grain. The traditional method of harvest, moreover, is not easy and can be done only on a small scale, raising the price of the product.

The fragility of the grain is a major obstacle to successful harvest. When combines are used, the plants are damaged for later harvests and the grains are often shattered, making them less appealing to buyers. Plant scientists, however, are developing ways to make the seed more resistant to shattering. Modern



crop developments include breeding stronger grains, freezing and refreezing seeds to increase their viability, and growing the plants in experimental paddies where they can be flooded, drained, dried, and harvested by combines.

Modern processing methods for wild rice are long and complex, resulting in a two-dollar-per-pound processing cost. The rice is first roasted in large rotating drums until the grains are golden brown. Then the grains are cooled and threshed in a drum containing rotating flails. Both of these processes must be done carefully, however, for over-roasted grains burn, under-roasted grains cannot be hulled, and over-threshed grains lose their outer layer, which contains the protein. Nonetheless, the yield ratio is quite high: one pound of finished rice per three pounds of fresh rice.

We found cooking the wild rice (or should we say, eating it) to be the most fun, and the results were delectable. Unfortunately, at six dollars a pound (because of the aforementioned harvesting and processing difficulties) it is a true luxury. Perhaps as geneticists improve the plants' harvestability, this will change. Yields increased from 200 pounds per acre in 1959, to 700 pounds per acre in 1967, and are still improving.

When using wild rice, remember that one cup of raw (processed) wild rice yields about five cups of cooked rice. You will need three to four cups of water for every cup of rice if you cook by boiling. Its flavor is nutty and distinctive, and excellent complement for meats, nuts and seafood.

We found several recipes (given below) which we tested and found to be very good. Although we admit that harvesting rice is probably harder than it sounds and that it is expensive, we hope that you will take the time to observe it growing in the marshlands along the Delaware, and especially to try our recipes

Valerie Wong, Cook College '86, enjoys Wild Rice Side Dish

Field of wild rice in a Salem County freshwater marsh.

DR. RICHARD ILNICKI

using this very interesting and very edible plant.

Where to See Wild Rice

Curious to see what wild rice looks like? Even in late fall, when the plants are dry and spent, they can be seen in abundance, primarily in the marshes along the Delaware River's major tributaries. Good places to view wild rice are along the Rancocas Creek in Burlington County, along the Cohansey and Maurice Rivers in Cumberland County, at Mannington Meadows and along Alloways Creek in Salem County. Sizeable stands can also be seen along the Wading River, downstream from Evans Bridge in eastern Burlington County. You can see and touch wild rice plants from the Marsh Trail at Rancocas Nature Center, Rancocas/Mount Holly Road, Mount Holly. Because wild rice needs fresh water to grow, it is not generally found in the saltwater marshes along the Atlantic coast.



If you want to try wild rice, it's best to buy some at your local supermarket or gourmet shop—either plain or mixed with long grain rice. Because of the involved harvesting and processing requirements, it's not practical to pick and cure your own.

Wild Rice Side Dish

1 cup of wild rice	1 tsp. marjoram
1/3 cup brown rice	1/4 tsp. rosemary
5 cups stock or water	1/4 tsp. thyme
1 carrot	1 tsp. salt
1 large stalk celery	dash pepper
6 green onions, chopped	pinch of garlic
2 tbs. oil	1/3 cup toasted almonds

Chop celery and carrot. Sauté onions. Add stock and boil. Stir in all ingredients except almonds. Bring to boil. Cover and simmer for an hour. Top with almonds.

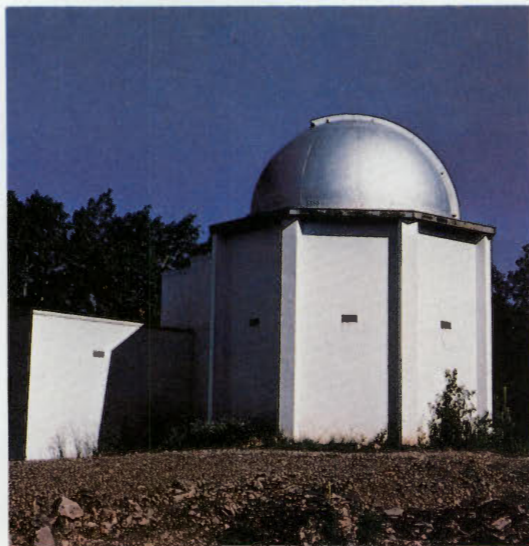
Wild Rice Muffins

1 cup cooked wild rice	1 1/4 cup flour
2 eggs, beaten	1 tbs. baking powder
5 tbs. oil	1/2 tsp. salt
1 cup milk	3 tbs. sugar

Preheat oven to 425°. Grease a dozen-muffin tin. Stir rice with eggs, oil, and milk. Combine flour, baking powder, salt, and sugar and add to rice mix gradually and thoroughly. Bake 12-15 minutes until lightly browned.



Halley's Comet Returns



BY HELEN COLLINS

There are billions of them, say the astronomical experts, perhaps even trillions. But the one currently putting in an appearance for the first time in three-quarters of a century is the most famous of them all.

Halley's, the comet that was first recorded blazing across the skies in 240 B.C., is once again nearing the earth, giving New Jerseyans a chance to view it with telescope, binoculars, or even the naked eye. With the exception of individuals blessed with exceptional longevity, seeing Halley's is a once-in-a-lifetime experience.

At Voorhees State Park in High Bridge, the New Jersey Astronomical Association (NJAA) is taking full advantage of this cometary season. A call to their Edwin E. Aldrin Jr. Astronomical Center at 201-638-8500 will result in a message direct from the observatory, announcing details about Halley's as well as the NJAA's viewing schedule. The association recently sponsored an open house as well, featuring a talk by Halley's expert Joseph Laufer.

Laufer, who has taken a leave from his job as associate dean at Burlington County College in anticipation of Halley's return, became intrigued by the comet when he realized that both his parents were born in 1910, the year it was last visible from earth.

A comet, according to Laufer, can be characterized as a "dirty snowball." In reality, it is a vast cloud of gas and dust following an elliptical orbit, with a starlike nucleus—the snowball—made of ice, dust and stones and mixed with frozen gases. As a comet approaches the sun, its outer parts begin to evaporate and the nucleus becomes surrounded by a hazy cloud that may stretch across a distance 10 times the size of the earth. Sunlight causes the cloud to shine and to appear as the comet's head and creates a tail by pushing dust and gas in the opposite direction.

Halley's, the brightest of the comets that pass near the earth, is the oldest known to man. In the 29 returns since it was first seen more than two thousand years ago, the comet has never been missed. While professional astronomers and amateurs alike have anxiously awaited its 1985-86 appearance, Halley's and other comets were once believed to be evil omens. This famous comet was thought to have foretold the death of the Roman ruler Agrippa in 11 B.C., the destruction of Jerusalem in 66 A.D. and the defeat of Attila the Hun in 451; its appearance in 1066 was associated with the Norman invasion of England later that year.

Astronomer Edmond Halley, the comet's namesake—pronounced, contrary to popular belief, to rhyme with valley—spotted the comet in 1682 and used mathematical equations to accurately predict its return some 76 years later. By doing so, Laufer points out, Halley proved that comets are part of our solar system rather than "flukes of nature."

While Halley's current appearance will be obscured by the proliferation of electric lights and by the position of its orbit in relation to the earth's, it will be studied more than any other comet in history. In March 1986, five unmanned space probes from around the world will carry cameras out to meet it.

Where to Look

In November, according to experts, the comet will grow steadily brighter, and will be visible with binoculars in dark places away from city lights.

On the evenings of November 15 and 16, Halley's will pass just south of the Pleiades, a hazy star cluster also known as the Seven Sisters visible in the eastern sky after darkness falls. Even with binoculars, the comet will ap-

pear only as "a dim, fuzzy blob" without a tail.

In December, Halley's will become faintly visible with the unaided eye, but only under the darkest conditions. By now it will be high in the southern portion of the sky, and amateurs who spotted it near the Pleiades should be able to follow it nightly. Viewers are advised to search for Halley's one and a quarter hours after sunset, just as darkness descends. Although many people expect comets to streak rapidly across the sky, Halley's will not appear to be moving.

As December turns to January, the comet will show up lower and lower in the sky, moving from the south to the west. By January 25, it will appear almost on the horizon, and by the end of the month it will set before the sky becomes dark and thus be lost to view.

Though Halley's will be blocked by the sun throughout most of February, it will reappear in the morning twilight in the east with a bright, starlike head as the month draws to a close. In March the view will improve, and late in the month it can be observed in the southeastern sky just before dawn, with a long tail. In early April the comet will be at its brightest low in the southern sky before dawn. It will then disappear from view until the last half of the month, when Halley's will return to the evening sky shortly before it departs deep into space until the year 2061.

A Chance to Stargaze

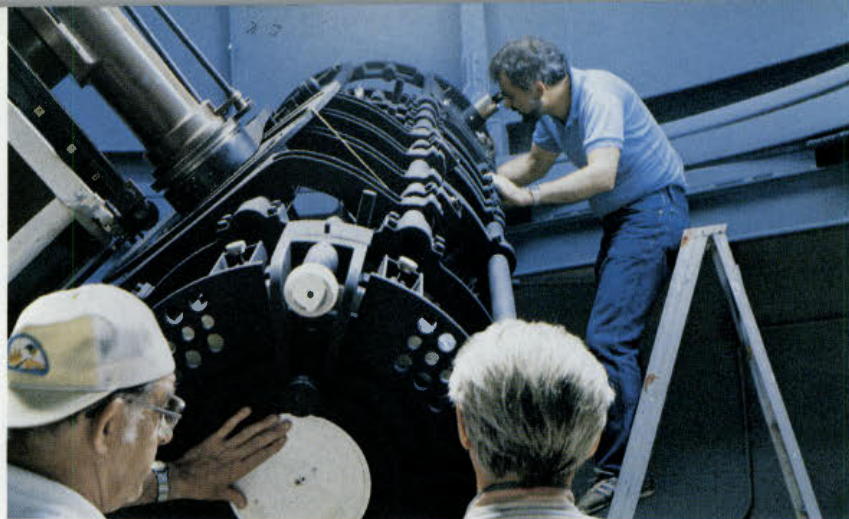
Halley's watchers, says NJAA president Ben Cavotta, can also spot familiar constellations, most of which are visible throughout the year. In the late fall in the southeastern sky, careful observers using a telescope, binoculars or the naked eye may find Orion the hunter, known in Greek mythology as Diana's lover and the tallest and handsomest of men. On Orion's shield, Cavotta points out, is the Orion nebulae, a cloud of gas that glows because of the nearby "nursery" where new stars are formed.

To find Taurus the Bull and the Pleiades, amateur astronomers can use Orion's belt as a pointer toward the west. The bull, which seems to be backing away from Orion in a never ending battle, has the Pleiades on its shoulder, resembling a very little dipper. With the naked eye, according to Cavotta, the Pleiades cluster appears to consist of about six stars; with binoculars, the same cluster seems to be comprised of 20; and with a telescope, that number multiplies rapidly.

To Build a Telescope

According to John Schultz, one of the seven charter members of the NJAA, it was telescope building rather than stargazing that prompted his interest in forming an astronomy club. In the early 60's, he recalls, he and his friends built a telescope, which each member planned to use as a prototype to build one of his own. When it was suggested that they pool their skills to build a giant telescope instead, their biggest problem became the need for equipment and money.

In 1965, the group incorporated and arranged to lease the 18 acres the observatory now occupies at Voorhees State Park. Soon the fledgling organization acquired a telescope



from Indiana State University and a 16-ton dome, 19½ foot in diameter, from Princeton University. Schott Glass Works of West Germany contributed a huge telescope mirror, needing only to be ground and polished.

It was the members themselves who transported the equipment, spent four years preparing the glass, and built the facility that houses the observatory. They also built a concrete pier that extends 14 feet below the ground and 12 feet above to protect the telescope from vibration. Finally, in 1976, the 26-inch reflector telescope, which is driven by a computerized mechanism that continually moves it to the west to compensate for the eastward movement of the earth, became operational. Looking through it, says Cavotta, is like looking through 8900 eyes all at once.

This past summer, the 150 members of the N.J. Astronomical Association were encouraged by the enthusiasm and interest shown by Voorhees' new park superintendent Steve Ellis. "The observatory is a unique point of interest," says Ellis, "and I'd like to help more people take advantage of all it has to offer." He distributes NJAA fliers to everyone who camps at Voorhees, and tells anyone who will listen about this special facility.

The NJAA meets at the observatory at 8:30 p.m. on the fourth Saturday of each month and offers evening programs several times a month. During fair weather, meetings generally conclude with a star party that often continues into the wee hours of the morning. For the next few months, the focus of their activities will be on Halley's. As Cavotta, who is planning a springtime trip to Barbados to catch a better look of the comet, explains, "It's Halley's, and this is the only shot at it we're going to get."

The Edwin E. Aldrin Astronomical Center, named for the first U.S. astronaut born in New Jersey, is located on Route 513 in Voorhees State Park, one mile north of High Bridge. For information call 201-638-8500.

Other observatories open to the public are located in Princeton, Cranford and Paterson. For information about their activities and viewing schedules contact the Amateur Astronomers Association of Princeton, Box 2017, Princeton, 08540; Amateur Astronomers Inc., c/o Sperry Observatory, 1033 Springfield Ave., Cranford 07016; or the North Jersey Astronomy Group, Box 4021, Alwood Station, Clifton, 07012.

N.J. ASTRONOMICAL ASSOCIATION PHOTOS

Halley's Comet the last time around.

Built by volunteers, the Edwin E. Aldrin Astronomical Center at Voorhees State Park has a dome 19 feet in diameter.

With NJAA's 26-inch telescope it's possible to see comets, constellations and nebulae.



BY SUSANNE BANTA HARPER AND SALLY DUDLEY

New Jersey's



Glorious Glass Collection

Down in southern New Jersey they make glass. By day and by night the fires burn on in Millville and bid the sand let in the light.
Carl Sandburg, 1904

The museum at Corning, New York may be larger and that at Sandwich, Massachusetts more famous, but the collection at the Museum of American Glass at Wheaton Village is unequaled. Ranging from pedestrian industrial flasks to flamboyant art glass the exhibits feature items made in New Jersey and give an appreciation of the state's unique role in America's glassmaking industry.

Glassmaking started in New Jersey when entrepreneur Caspar Wistar crossed the Delaware from Philadelphia in 1739 to establish America's first commercially successful glasshouse. He was also defying England's ban on colonial glass manufacture. Sparing no expense, he sought and ultimately found an ideal site for a factory on 1000 acres in Alloway, Salem County.

A Natural Combination

It was southern New Jersey's combination of natural resources that attracted Wistar and other 18th and 19th century glassmakers to Glassboro, Salem, Millville, Bridgeton and Vineland. The pine forests were a ready source of fuel for the melting furnaces that converted sand, lime and soda into glass. The area's virtually inexhaustible supply of pure sharp sand provided the basic raw material. Because of southern New Jersey sand's well-defined edges (as opposed to beach sand's rounded edges), the sand, lime and soda stay in suspension



dition that led to the creation of the lovely pitchers, bowls, paperweights and other decorative objects now so admired by collectors and curators.

Probably the best-known end-of-day pieces at the Wheaton Museum are the Millville Rose paperweights. In the late 19th and early 20th centuries, paperweights were a standard stationery store item, made at many other glasshouses throughout the U.S. and in Europe, especially at the St. Louis and Baccarat factories in France. Ralph Barber, known as the greatest glassblower in America for his skill at blowing double walled X-ray tubes, worked for several years with his end-of-the-day molten glass and a special crimp to create the first Millville Rose paperweights. Other glassblowers have followed his lead, and the Millville Rose and its variations—mushroom, umbrella and devil's fire—are still made today.

Of the many attractions at the Museum, the collection of elegant art glass is outstanding. This style is the result of a deliberate desire to create glass objects with artistic qualities. The technique uses metal oxides to tint the glass and produce a satiny or iridescent quality in the colors, which most commonly are gold, green and blue. Although the most famous examples of this style are associated with the name Tiffany, many New Jersey artisans—especially those at the Durand Art Glass Division in Vineland—produced works that rival Tiffany for both originality and artistic merit.

A Living Museum

At a reconstructed 1888 glass factory a living museum preserves the methods of the past. A short walk from the Museum, visitors can watch skilled artisans produce an assortment of beautiful objects while a narrator describes the process in detail. The glassblowers handle the 2000 degrees Fahrenheit molten glass with deceptive ease and speedily transform a bubble of glowing glass into a vase or paperweight.

Many paperweight designs seem to have gotten into the heavy glass orbs by magic—or so one might think before watching one being made. Craftsman Jeff Sammartino creates the design within a paperweight by pressing the molten glass ball into a form which contains bits of colored glass. As the glass is rolled, the indentation of the color is drawn up into the center. Jeff alternately heats and shapes the glass ball until the floral design he has chosen is fully spread out. In the final stage he cuts excess glass from the ball for a smooth, flat bottom and places the paperweight in the oven overnight for gradual cooling.

Part of Wheaton Village, The Museum of American Glass is located off Route 55 in Millville. There is an admission charge. A number of shops sell a variety of handmade glass and pottery items, many produced at the village. Although not inexpensive, they are often one-of-a-kind items. For a fee, you can make your own paperweight, guided by one of the master artists. For further information about hours and special events call 609-825-6800.

PHOTOS PROVIDED BY THE MUSEUM OF AMERICAN GLASS AT WHEATON VILLAGE.

A grouping of beautiful American glass from the Wheaton Museum includes an early 19th century south Jersey pitcher and flask on the left, an original Mason jar and Millville Rose in the middle and a Durand art glass vase, third from right, rear.

Examples of the Millville Rose design developed by New Jersey glassblowers.

and do not settle out. The network of waterways that flow into the Delaware River offered a smooth and direct route to transport the finished fragile product to Philadelphia, a major market and port. And the salt hay that grows in the tidal marshes along the Delaware was a natural and effective packing material.

The business of the 18th and 19th century glasshouses was practicality, not art. They produced such homely wares as window glass, bottles, jars and flasks. The variety is surprising. At the Wheaton Museum there are round bottles, square bottles, tall bottles, short bottles, bottles in the shape of fish, pigs, pineapples, log cabins and more. The bottles are green, blue, brown, amber, clear, silver, or opalescent depending on what mineral oxides glassmakers added to the basic raw materials. There are bottles for tonics, for drugs, for cosmetics, for pickles, for fruit, for mineral water, for soda, for perfume, for ink, for hair dye. The list goes on and on.

There are examples of the early Mason jars, named for Vineland tinsmith John Mason. Working with a glassmaker from Crowleystown on the Mullica River, Mason developed the tin lid-jar combination still used by home canners today. Flasks generally have a common shape and a political slogan or other advertisement. Used for "strong drink" they were refilled at taverns with local brew.

An American Art Form

But man does not live by practicality alone. The Pine Barrens glass industry developed a tradition of giving the glassblowers the tailend of the day's pot for their personal use—a tra-





CORNELIUS HOGENBIRK



CORNELIUS HOGENBIRK



WILLIAM D. GRIFFIN



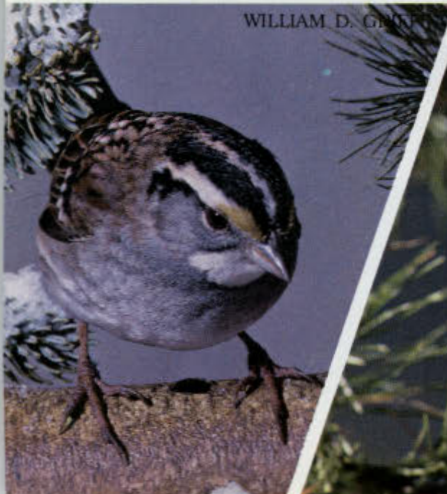
CORNELIUS HOGENBIRK

If you are a "summer person" as I am, you probably begin to shiver as soon as you see the first leaf begin to turn, bid your heartier friends adieu for the winter, and hibernate in the warmth and comfort of your never-quite-warm-enough home. There you wile away the winter weekends, venturing out for the first snowfall to make the obligatory snowman or to shovel the walk, then hurry back inside to hot chocolate, magazines, and indoor projects. If you enjoy this routine, good for you! Continue with your basement remodeling and bathroom painting, and ignore this article. BUT, if you gaze out the window wistfully, thinking that you would love to be part of what is going on out there—if only it weren't so darn cold—I'd like to suggest an outdoor activity you can pursue while you sip your tea and bundle your feet: winter bird watching in your own backyard.

When the leaves have been dashed to the ground by the November rains, and the first few frosts have killed everything except the weeds in my lawn, I break out the sunflower seed and cracked corn and fill my bird feeder. I have the simple, inexpensive redwood and glass type (pictured) installed atop a redwood pole in the corner of the backyard. It is in full view from the dining room window, and this room becomes my winter headquarters. I can observe the comings and goings of my backyard bird community while writing letters and paying bills, eating breakfast, talking on the telephone, reading, or just stopping by for a few minutes as a respite from other activities.

I am always somewhat amazed by the different types of birds that are attracted to the simple and hardly natural setup in my yard.

CORNELIUS HOGENBIRK



WILLIAM D. GRIFFIN



Indoor Birding

Winter Fun Without Frostbite

BY BILLIE JO HANCE

While my built-up neighborhood is near some wooded areas, it is typical of a central New Jersey housing development. The first year I set up the feeder, I saw cardinals, house finches, tufted titmice, and, of course, blue jays. Since then, the list has grown to include black-capped chickadees; the red-bellied, downy, and hairy woodpeckers; purple finches; numerous species of sparrows; juncos; and red-breasted nuthatches. When I see a bird that is new to the feeder, I run for the binoculars and the field guide; otherwise, the feeder is so close to the house that binoculars are not really necessary. In fact, I tend to find them a bit restrictive, as they limit the field of vision to one spot only. And the real fun of backyard bird watching is discovering how one's entire yard is involved in the feeder action.

Powerplays and Hierarchies

The hierarchy of the bird feeder is its most fascinating aspect. The smaller birds—the juncos, sparrows, and finches—flit to and from the feeder all day, as if eating were a continuous interjection into their other daily chores. As they eat, they nervously turn their heads this way and that, fearing that something will come along to claim their place. Something generally does; the blue jays, voracious eaters, swoop down on the feeder, usually in early morning and mid-afternoon. I have a love-hate relationship with these birds. They eat incredible amounts of seed, and seem to drop and spill as much as they eat. (This ground food is later cleaned up by the juncos.) The jays scrap and squawk, and can noticeably deplete the feeder in an afternoon. Though I complain about the dent they

put in my bird seed budget, I have to admit that they have an exotic quality about them—perhaps it is the prehistoric, pterosaurian look of their huge, tufted heads—which makes them fascinating to watch. They are definitely the bullies on the block, however, and reign supreme at the feeder.

The woodpeckers are interesting transients in the community. They do not feed on the seed, but seem to want to be associated with the action in a neutral way. They walk up and down the feeder pole, pecking at it half-heartedly. They aren't daily visitors, so when they do arrive, I observe them through the binoculars or the zoom lens of a camera I've set up by the window.

The tiniest birds, the tufted titmice, black-capped chickadees and the nuthatches, are my favorites. They are neat and fastidious in their feeding habits, and they remind me of the darling, innocent birds in the Walt Disney movies of my childhood. This year I have added a lovely little ceramic feeder, handmade in New Mexico and a gift from another bird watcher, to the outdoor scene. It has a small opening which discourages the jays so these miniatures can eat in peace. My chief enjoyment is to watch the nuthatch run up and down the silvery bark of the maple, with a seeming disregard for the laws of gravity.

As the winter wears on, the community fluctuates in size and diversity. From time to time there will be a two- or three-day stretch when many of the regulars don't come around, and I assume they are at someone else's feeder down the street. I always make sure, however, that the feeder is filled, and I put out extra seed during periods of heavy snow.

When the first spring rains find me squishing fat, juicy worms underfoot in my driveway, and the earth has greened up after the last surprise April snowfall, I stop filling the feeder until the following fall. I have found that the only birds that continue to come around after spring are the blue jays, starlings, and grackles, and I figure these big guys can fend for themselves. Also, since it is warm again, I come out of hibernation myself, and am busy with all the activities I couldn't do for the past six months, such as outdoor bird watching! I reserve this special pastime strictly for the long, cold winter.

So let it snow and blow and freeze. You don't have to get chapped lips and frostbite in order to be a part of the winter nature scene.

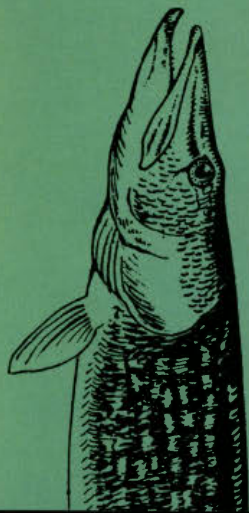
Top to bottom and left to right: Birds most commonly seen at feeders include the junco, white-breasted nuthatch, tree sparrow, white-throated sparrow, black-capped chickadee, tufted titmouse, house finch and bluejay.

CORNELIUS HOGENBIRK

CORNELIUS HOGENBIRK



Jersey State Library



Fishing for Pike, Pickerel & Muskie

BY ROBERT STEWART

No species of freshwater fish has inspired more fables than the northern pike. With a malevolent eye and tail-drooping posture, it was once identified as Luce, the waterwolf. The Anglo-Saxons compared it to their ancient weapon, the pike, which they called *esox* and the fish became *Esox lucius*, the savage and pitiless wolf pike.

Many fishermen believe pike are such voracious predators that they can single-handedly annihilate other gamefish. This is not the case. Pike, like other predators eat what is most readily available. They do not selectively feed on gamefish and in fact actually benefit bass and trout populations by helping to keep pan and forage species in balance. Scientists recognize that some predation is necessary for a quality fishery.

In North America, the pike family is made up of five species: chain pickerel, redfin pickerel, grass pickerel, northern pike and muskellunge, the largest of the group. The pickerel and muskellunge are native to North America only; the northern pike is found throughout the northern hemisphere. Only the chain and redfin pickerel are indigenous to New Jersey. Northern pike and muskellunge have been experimentally introduced into the state's waters in recent times.

In addition, several hybrids have been found. The most prominent for fishermen and fisheries managers is the tiger muskie, a cross between the northern pike and the muskellunge. This sterile hybrid has a rapid growth rate—exceeding one inch a month in the wild—and can be easily propagated and raised in a hatchery. Other members of the pike family can also be artificially hatched, but are more difficult to rear.

Specific Characteristics

Although it is not easy to identify the different pike species, each has specific cheek and gill cover characteristics. Chain, redfin and grass pickerel have scales covering the entire cheek and gill cover. Northern pike and tiger musky have scales on the entire cheek and the upper half of the gill cover. Pure-strain muskellunge have scales covering only the upper half of both the cheek and gill cover.

The redfin pickerel, with its dark green or brownish coloration, stubby snout, dark vertical bars crossing its sides and reddish tinged pelvic fins is easy to distinguish from the chain pickerel. Common throughout New Jersey, it is primarily a stream dweller. Rarely attaining a length of 14 inches, the redfin is seldom sought after by anglers.

The chain pickerel on the other hand is a prized gamefish, attaining lengths of over 24 inches and weights in excess of four pounds. The all-tackle world record, (and still the state record) was at one time held by a 10-year-old New Jersey angler: a nine pound, three ounce fish caught in Lower Aetna Lake, near Medford Lakes in Burlington County, in 1957.

In New Jersey, chain pickerel are found state-wide in ponds, lakes, bogs, streams and



Ben Ribaud with NJ record tiger muskie of 35 lbs. 2 ozs. caught at Delaware Water Gap.

rivers of every size and description. Spawning occurs in early spring, usually in March wherever there is thick rooted aquatic or flooded terrestrial vegetation—in marshy stream backwaters, overflow areas or shallow portions of lakes and ponds. Because of their penchant for vegetation, pickerel are often trapped in shallow pockets following the retreat of spring floodwaters. Females lay long strings of eggs, anywhere from 1,500 to 3,000 at a time. Incubation lasts from seven to ten days, depending on water temperature.

At first the fry eat minute plankton organisms. Their diet quickly changes to aquatic insects and ultimately to other fish. Even in winter chain pickerel are always in search of prey and ice fishermen take many with tip-up and hand lines, often in water only two to three feet deep. Primarily because of their voracious nature, chain pickerel rarely live more than six years, with a maximum life expectancy of only nine years.

1960's Introduction

During the 1960's the Department of Environmental Protection's Division of Fish, Game and Wildlife and several different sportsmen's organizations first introduced northern pike into New Jersey waters, most successfully at Wawayanda Lake, in Highland Lakes, and Spruce Run Reservoir in Clinton. Fish over 10 pounds have been caught at both locations. This experience and concurrent feasibility studies indicate that some of New Jersey's larger impoundments and river systems can support northern pike populations.

Extremely difficult to rear under hatchery conditions, northern pike are subject to high rates of mortality if techniques are not properly started and established. The related tiger muskie (a cross between northern pike and muskellunge), on the other hand, is relatively easy to rear in a hatchery and will readily accept a soft-pellet diet. Using experience gained raising tiger muskies, a successful northern pike program has been developed at the Charles O. Hayford Hatchery in Hackettstown.

Initial stocks of tiger muskies and northern pike raised at the Hayford Hatchery were introduced at Spruce Run Reservoir and Budd Lake in Morris County in 1981. The program's success is evident. A state record tiger muskie, weighing 17 pounds was caught in June 1984 at Budd Lake. Also, during the spring that year, 60,000 eggs were stripped from adult northern pike netted at Spruce Run. Taken to the Hayford Hatchery and carefully monitored, these eggs produced over 6,000 fingerlings for release just three months later.

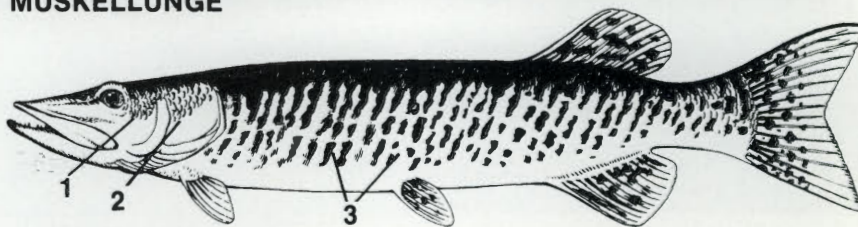
The future of New Jersey's tiger muskie and northern pike program appears promising. Stocking these species in New Jersey's larger lakes and rivers could provide more opportunities for better fishing for many anglers. With existing facilities, an interim annual production goal of 15,000 fingerlings has been set. To realize the full potential of this fishery, expanded warm water hatchery facilities are necessary.

PHOTOS BY DIVISION OF
FISH, GAME AND WILDLIFE



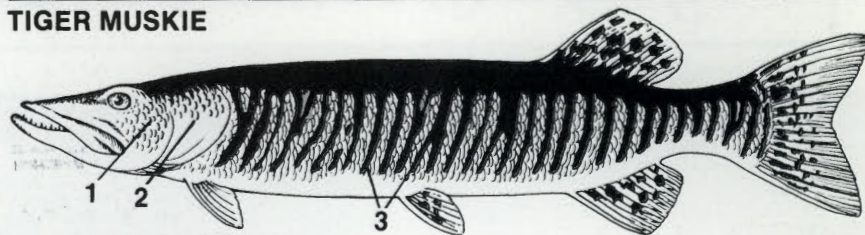
Herb Hepler with NJ record Northern Pike of 30 lbs. 2 ozs. taken at Spruce Run.

MUSKELLUNGE



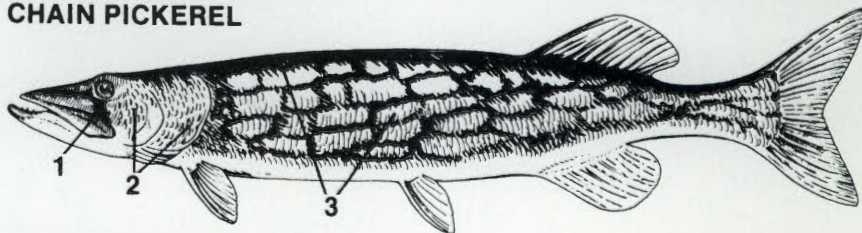
1. Upper half of cheek scaled only
2. Upper half of gill cover scaled
3. Usually grey-green with light vertical bars

TIGER MUSKIE



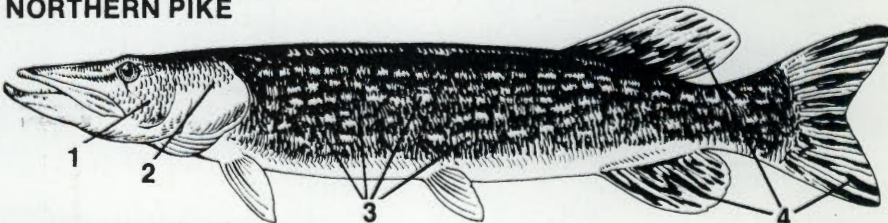
1. Cheek fully scaled
2. Upper half of gill cover scaled
3. Vertical dark grey-green bars about equal in width to light bars separating them

CHAIN PICKEREL



1. Distinct dark vertical bar
2. Entire cheek and gill cover scaled
3. Dark green back, yellow chain-like pattern

NORTHERN PIKE



1. Cheek fully scaled
2. Upper half of gill cover scaled
3. Dark green back, yellow bean-like spots (no distinctive chain pattern)
4. Dark striping on caudal fins and tail usually present

Note: There is a 24 inch minimum legal size limit on tiger muskies and Northern Pike in New Jersey and all sub-legal fish must be returned to the water unharmed.



Enjoying New Jersey's Winters





BY KENNETH W. DAHSE



When the cold winds begin to blow and the snow starts to fly, many people retreat indoors. They suffer under the misconception that it's too cold to enjoy the outdoors during winter.

Yet winter is one of the best seasons to enjoy the beauty of New Jersey's outdoors. Except for certain water sports, you can do almost everything you do in the summer without any of the disadvantages. During the winter, there aren't any crowds, there's no waiting, and there are certainly no bugs.

You can jog, camp, bike ride, hike, fish and backpack, as well as enjoy typical winter sports such as ice skating, sleigh riding, cross country skiing and snowmobiling.

The key to enjoying winter is staying warm. With the proper clothing, equipment and cold-weather techniques, this is easy. By using the proper procedures, you will be able to experience the unique beauty and splendor of the winter months.

Layers and Layers

A great way to stay warm and comfortable is to layer clothing. You can add or remove layers as necessary. The best materials for layering are polypropylene, wool and nylon. All three have certain properties that are far superior to other types of materials for maintaining comfort and warmth.

Polypropylene is excellent as an undergarment worn next to the skin. This synthetic material is actually spun plastic, yet it is as smooth and soft as silk. But most importantly, it doesn't become wet from perspiration. This is extremely important in staying warm.

Regardless of how cold it is, you will perspire during winter activities. This will soak common cotton undergarments, which causes the body to lose heat, making it uncomfortable and dangerous. Hypothermia (cooling of the body's core) can kill even in mild winter temperatures. Perspiration passes through polypropylene and onto the next garment.

Wool should be the second layer. One or more layers of wool will keep you warm even if the material becomes wet. It allows some moisture to pass through it, although it absorbs some, too. Down jackets are popular and are OK as long as they stay dry. Once they become damp or wet, they lose most of their heating ability. This is why wool is so superior. It's great protection against the cold even if it's wet.

The last material that is excellent for winter use is nylon. Although nylon breathes, allowing some moisture and heat loss, it protects you from the wind. The wind chill factor can change a mild winter day into arctic conditions in a few minutes. An outer parka is essential to keep the wind from biting into the body and sapping it of heat. It acts like a shield holding heat in and keeping cold out.

Cold feet, put on a hat

Experienced winter outdoorsmen say, "If your feet are cold, put on a hat." The body loses most of its heat through the head. This forces the body to pull warmth from the extremities to keep the head warm. By wearing a hat, you not only keep your head warm but the rest of your body, too.

A wool knit hat is the best choice. Many people prefer a balaclava. It is similar to a typical knit hat, but it can be pulled down over the entire face leaving only the eyes exposed.

Mittens keep hands the warmest. Gloves isolate each finger and therefore cut down the shared body heat. Wool again is the first choice. You can wear more than one pair, or buy an extra heavy pair. An outer wind mitt is a good idea also and will serve the same purpose as a parka.

Keeping the feet warm is especially important. Wool socks with polypropylene undersocks are the best combination. Rubber boots are best for overall warmth and keeping the feet dry. Leather boots will become wet if they're in snow for a long time, and they aren't warm. Sorel boots, which have rubber bottoms and leather uppers, are a favorite of many winter enthusiasts. They also have thick wool felt liners for warmth and are excellent for most winter activities.

Boots should be large enough so you feel comfortable wearing two pairs of socks. If boots are too tight, your feet will get cold. In fact, all winter clothes should be loose fitting so they can trap warm air produced by the body.

Besides clothing, there are several other ways to stay warm in the winter. Both food and activity can help keep the body warm. The body is like a furnace and food is like a fuel. Certain fuels are better than others for producing maximum heat. To stay warm in the winter eat foods high in carbohydrates

Top left: Author's daughter and cousin enjoying winter stream.

Top right: Mountain view.

Bottom left: Winter camping is not recommended unless you have had some formal training.

Bottom right: Author with full backpacking gear.

PHOTOS BY AUTHOR
EXCEPT AS CREDITED





*View from fire tower,
Stokes State Forest*

and fats, and eat often. Don't be restricted to three meals a day. Snack all day long and drink plenty of fluids (not alcohol—it will cause heat loss). Drinks such as hot chocolate, warm Tang, and Gatorade will help maintain body fluids, energy and warmth. Carry a thermos with a warm drink. Snacks of chocolates, cheese, dried fruits and salami help keep the body's furnace producing heat.

Stay active, stay warm

Staying active will help you stay warm. If you start to get chilly, exercise for a few minutes. If you are active and still cold, it's best to go inside.

Hiking in the winter is great. The cold, crisp air is filled with pristine scents, clear views and an abundance of details. Fresh snow on the grounds allows you to follow the signs of wildlife. On one hike that my wife, Linda, and I took we saw the tracks of deer, raccoons, field mice and groundhogs. We followed the deer tracks into a ravine by an icy stream and up a small hill. Then we spotted his tan fur glittering in the sun, backdropped against the powder white snow. Perfectly still, he watched us for what seemed like an eternity until we made some noise. Then he shot off like a bullet flying over rocks and disappeared into the white forest.

Bike riding is enjoyable. Many parks are open year round, offering bikers almost car-free roads. Island Beach State Park is a fantastic place to try the invigorating challenge of winter biking. You ride past dunes, listening to the pounding surf and whistling wind in relative solitude. The wild charm of the winter ocean is awe inspiring.

Ice fishing and ice skating are two most enjoyable activities. There are numerous lakes statewide to visit. One of the most popular is Greenwood Lake on the New Jersey/New York border. Northern New Jersey is usually cold enough to allow several good months for experiencing these sports.

Cross country skiing is a nice way to explore the winter forest. Unlike downhill skiing, there

aren't any life passes needed or lines to wait on. You can enjoy the solitude and scenery of the forest without any aggravation.

New Jersey's rolling hills are fantastic for sleigh riding. Although many people view it as a children's activity, it is actually a superb way to exercise and stay in shape.

Some people are even adventurous enough to try winter backpacking. Camping out during the winter is certainly a challenge and a danger. It is not recommended unless you have had some formal training. With most other sports, you can get out of the cold in a relatively short time. But with backpacking, you usually stay in the cold for at least 24 hours. This makes staying warm and comfortable more difficult but still possible with the proper skills and equipment.

Winter camping may seem like a lot of work, but the rewards are worth it. It allows you to encounter the forest in its full winter glory. The wind whistling through crackling and moaning trees is very eerie—almost supernatural. At other times, the silence is complete.

Regardless of what winter sport you enjoy, you need to adjust the gear and clothing to fit the activity. Generally, the more active you'll be, the less clothing you'll need. You should have enough clothes to keep warm when you are cooling off, but don't overdress to begin. This is the advantage of layering rather than wearing one heavy coat.

Many New Jersey parks and forests are open all year and offer a diversity of activities. For example, Ringwood State Park in Passaic County and Wawayanda State Park in Sussex County have cross-country skiing, snowmobile trails, hiking, sleigh riding, ice skating and backpacking. Island Beach State Park in Ocean County has bike riding, hiking, jogging, fishing, beach walking and boating.

If you desire additional information about the parks that are open year round and their activities contact Resources Interpretive Services, Department of Environmental Protection, CN 402, Trenton, NJ 08625, or call 609-633-2102.

Dear Editor

New Jersey Outdoors welcomes letters from readers. Letters for publication should include the writer's name and address and should be mailed to: Editor, New Jersey Outdoors, CN 402, Trenton, N.J. 08625. Letters may be edited for reasons of length or clarity. Please keep the letters coming. We'd like to hear what you think about the magazine. We'll also try to answer questions and if we cannot, we'll ask our readers for help.

I'm writing to congratulate you on the September/October issue, especially the articles about the many opportunities for people to learn more about our environment when they visit state parks or take a hike on one of New Jersey's many trails.

Although none of the articles identified them, five Natural Areas were featured in two articles: "New Jersey's Parks: Unique Classrooms for the Outdoors," and "Day Hiking the Gap." The environmental education programs at Liberty State Park, Washington Crossing State Park, Cape May Point State Park make use of Natural Areas at those parks to show people the variety of habitats found in New Jersey. And the trails at the Delaware Water Gap crisscross two Natural Areas along Dunnfield Creek and at Sunfish Pond.

All of these sites are part of the New Jersey Natural Areas System, established in 1961 and designed to preserve and protect the habitats of the state's rare or endangered plants and animals, the locations of unique geological features and representative examples of ecosystems. The 41 Natural Areas cover some 22,000 acres, and represent approximately five percent of all land owned by the state.

As a member of the Natural Areas Council over the past year, I've been impressed by the diversity of sites in the Natural Areas System and its effectiveness in preserving New Jersey's natural heritage.

Kathryn Porter
Mendham

Thanks for the tip. For further information about New Jersey's Natural Areas System contact the Office of Natural Lands Management, Division of Parks and Forestry, Department of Environmental Protection CN 404, Trenton, N.J. 08625.

The 61-acre Capoolong Creek Wildlife Management Area, described in the

July/August issue (Letters to the Editor) deserves some further consideration. This state-owned land consists of a narrow strip, 75 feet wide and 6½ miles long.

The original railroad track from Sidney to Pittstown generally followed the flow line of Capoolong Creek. Fishermen and women follow the stream, not the railroad line. In doing so they are trespassing, perhaps innocently. However, their conduct and regard for property and wildlife have not given bordering property much cause for concern.

Hunters with gun or bow do cause us much concern. They do not stay on the state land but use it to walk unnoticed into the back woods of private property. We post our land for no trespassing, no hunting, etc. and the signs are torn off or used for target practice. These are not sportsmen. They represent only a small portion of hunters. Thoughtful, careful and experienced hunters make their own arrangements for hunting deer directly with land owners.

Hunting on an abandoned railroad right-of-way owned by the State presents hunters with several problems that could make it a disappointing day. With only 37½ feet on either side of the center line of the state-owned land, the hunter must be certain to drop a deer in his tracks. If the deer is able to take a couple of strides and the hunter follows, he is trespassing in the pursuit.

Past references to Capoolong Wildlife Management Area have not fully described it and left out important considerations. An informed public helps make good relations and I hope you will publish this information.

J.G. Bradshaw
Pittstown

Capoolong Creek Wildlife Management Area protects one of the few streams in northern New Jersey with a native trout population.

State law prohibits carrying a loaded firearm or knocked arrow on private or public property within 450 feet of an occupied residence, school playground, or school. That puts most of Capoolong Wildlife Management Area off limits to hunters. The Bureau of Wildlife Management in the DEP's Division of Fish, Game and Wildlife administers the state's Wildlife Management Areas and tries to

work with neighboring property-owners to help solve the kinds of problems you have described. For further information and assistance contact Rogers Todd, Chief, Bureau of Development and Maintenance at 609-441-3281 or the regional superintendent in your area: north—Joe Penkala at 201-383-0918; central—Ray Porutski at 609-259-7954; and south—Rich Hall at 609-785-0455.

NJO is great but not enough people know about it. People see the TV ads for "N.J. and You—Perfect Together" for one minute and then they're gone. Push NJO and then people will read about New Jersey all year. I've lived here since 1959 and you have shown me more about the state in the last two years than I learned on my own in the previous 24. Keep up the good work

Dave Moore
Millville

Enjoyed your article on the Memorial Day Bike Race (May/June '85). My father belonged to the "Bay View Wheelmen," on South Sixth Street between Springfield and 16th Avenues. As a child it was always great to see them take off on Sunday morning. Can you tell me where the Irvington Hotel was and who owned it?

Mrs. W. Scholl
Roseland

Sorry, we don't know. Can anyone offer any leads?

Several months ago I read in the Bergen Record about an article in NJO listing the biggest and oldest trees in New Jersey. I would like to obtain a copy of that article.

Edward Higgins
Lyndhurst

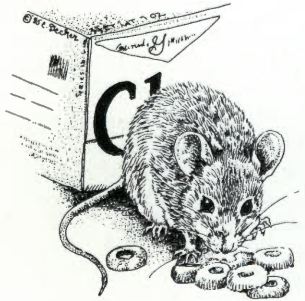
In the September/October 1984 issue, NJO published the seventh list of the state's record trees. Reprints are available from Resources Interpretive Services, Department of Environmental Protection, CN 402, Trenton, N.J. 08625.

Mice

By MIMI DUNNE



Deer mouse



House mouse



Meadow jumping mouse

Mickey Mouse's fan club is not likely to extend to his wild relatives. We all recognize mice, and some of us abhor the rodents when we see them in our homes or environs. Too often we assume the worst of these furry creatures—spreading filth and disease, destroying property. We may have a case against the house mouse, but there are at least ten other species of rats and mice native to New Jersey which have little or no impact on people, and have vital functions in the environment.

White-footed mice and deer mice are two of these those natives. They are both very common, abundant and similar in appearance. Both species are tawny, and though their coloring is variable, it is the shade of brown that deer take on in the summer. Both have white feet, but the deer mouse can be distinguished by its bi-colored tail. The upper half of the deer mouse's tail is dark, and the lower half white. The white-footed mouse, on the other hand, has a tail which is not distinctly two-toned. In both, the hairy tail is not quite as long as the head and body. Both species are active at night.

The meadow jumping mouse is another native, perhaps best known for its interesting means of locomotion. When observed in damp meadows or other open areas, it may look more like a frog than a mouse. Its hand legs are long, and its hind feet are much larger than the front feet. The tail, too, is long—several inches longer than the body—and has little hair on it. The long tail serves to counterbalance the mouse, in a similar manner as the tail in a kangaroo. This mouse hibernates in the winter.

The house mouse belongs to the Old World family of rats and mice. House mice originated in Persia and were introduced to this continent via the trading ships out of Spain and Italy. House mice are uniformly grey, and the tail is scaly and hairless. House mice cause tremendous losses to grain and other stored foods, and do structural damage to buildings as well. They are undoubtedly one of our worst introductions, albeit accidental.

All mice belong to the Rodentia order, the largest order of mammals in the world. All rodents have upper incisors, or teeth, which are continuously growing. These teeth are ground down during the consumption of normal food-stuffs, and supplements like shed deer antlers. Mice are distributed world-wide in nearly every conceivable habitat. Most of New Jersey's native mice are omnivores, consuming a variety of plant and insect matter. Their habit of consuming weed seeds and insects benefits

the farmer and gardener. Native mice are rarely of any economic importance.

Mice are famous for their tremendous reproductive potential. Consider, for example, the fecundity of an average white-footed mouse. Females become sexually mature at 10 to 11 weeks. Each female can have two to four litters per year, with two to six young per litter. The number of potential offspring from one female quickly becomes staggering. When this is multiplied by five or six females per acre in the average population, one begins to wonder why the world is not overrun with mice!

As it turns out, mice are well adapted for life in the "fast lane." It is a rare mouse that makes it to his first birthday. The role of mice in the food chain assures us that mice will never overrun the world. Why? Because too many winged, four-legged and reptilian predators depend upon a mouse meal for survival. Mice are adapted to producing many offspring, investing little parental care, and exploiting a variety of resources in the process. Their role as a food source for other animals cannot be underestimated. Their reproductive potential guarantees their survival as a species, barring the loss of suitable habitat.

In rural areas, the first cold snap of fall brings the "outdoor" mice in to homes and outbuildings searching for suitable shelter for the winter. White-footed and deer mice will use all manner of shelter, from old birds' nests and boxes to woodpiles, to cracks and crevices in buildings. The native mice, seldom of much consequence to the average homeowner, find themselves in trouble at this time of year. Once they're eradicated, though, they're not likely to be a problem.

Rodents have never generated the positive enthusiasm that birds and reptiles have enjoyed over the years, and as a result, little is known about the distribution and abundance of some of their members. In New Jersey, the Department of Environmental Protection's Division of Fish, Game and Wildlife's Endangered and Nongame Species Program is searching for ways to index small mammal populations in hopes of keeping tabs on their numbers and distribution. The tax check-off funded Endangered Species Program also keeps records of the more obscure rodents and small mammals. Some of these species, like the southern bog lemming, are interesting and important indicators of certain Pine Barrens ecosystems. Others, like the woodrat, have an enigmatic existence in New Jersey—their numbers are unexplainably low. All of these native mammals should be viewed as important and worthwhile members of Garden State ecosystems.

FRONT COVER

Cascading stream in northern New Jersey. Photograph by David Campione

INSIDE BACK COVER

White footed mouse nibbling on a fallen deer antler. Illustration by Carol Decker

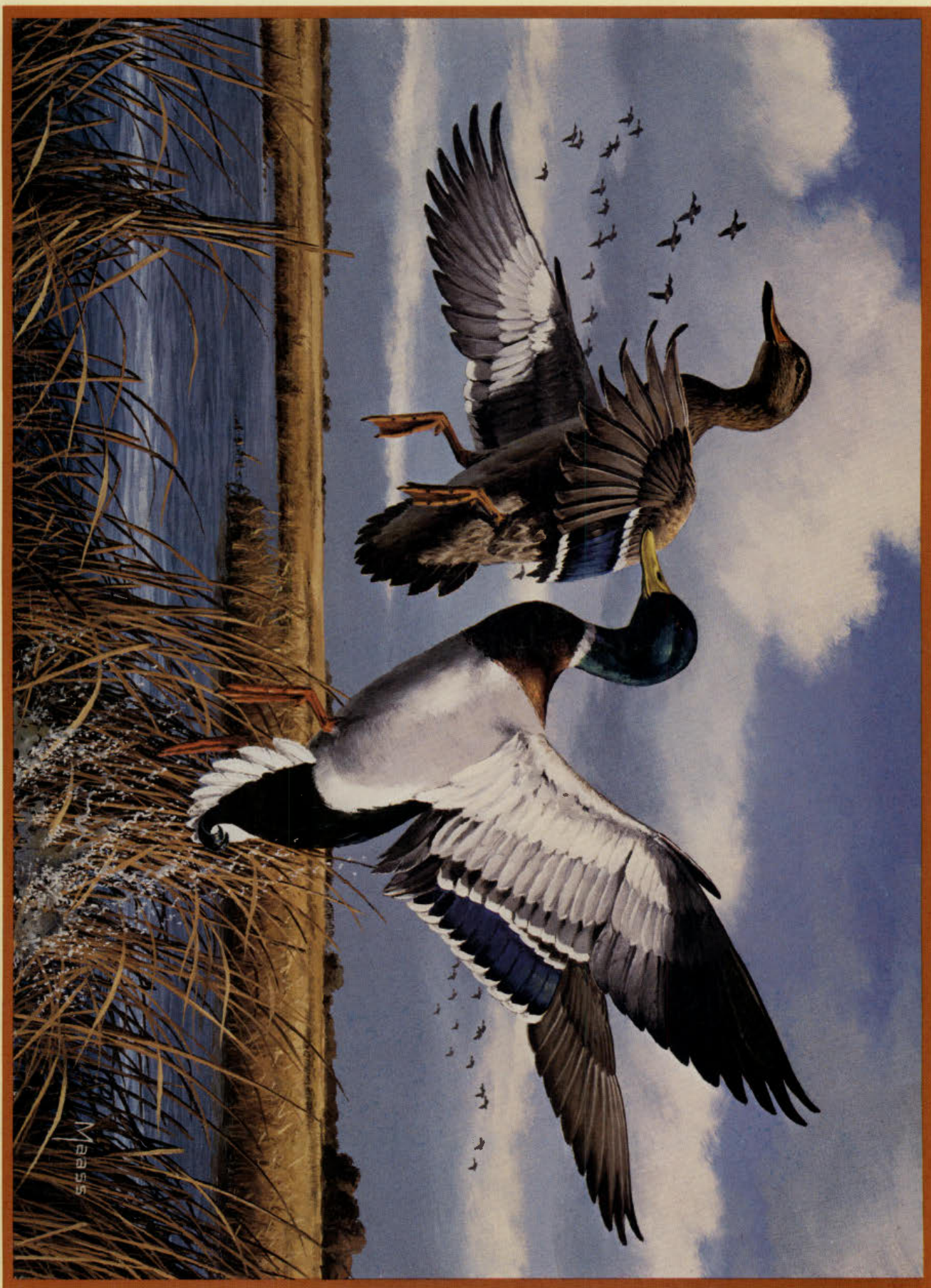
BACK COVER

New Jersey's second Waterfowl Stamp. Turn to page 13 for information on stamp and signed print sales information. Illustration by David Maass.



New Jersey State Library

'85 © Carol Decker



Maass