

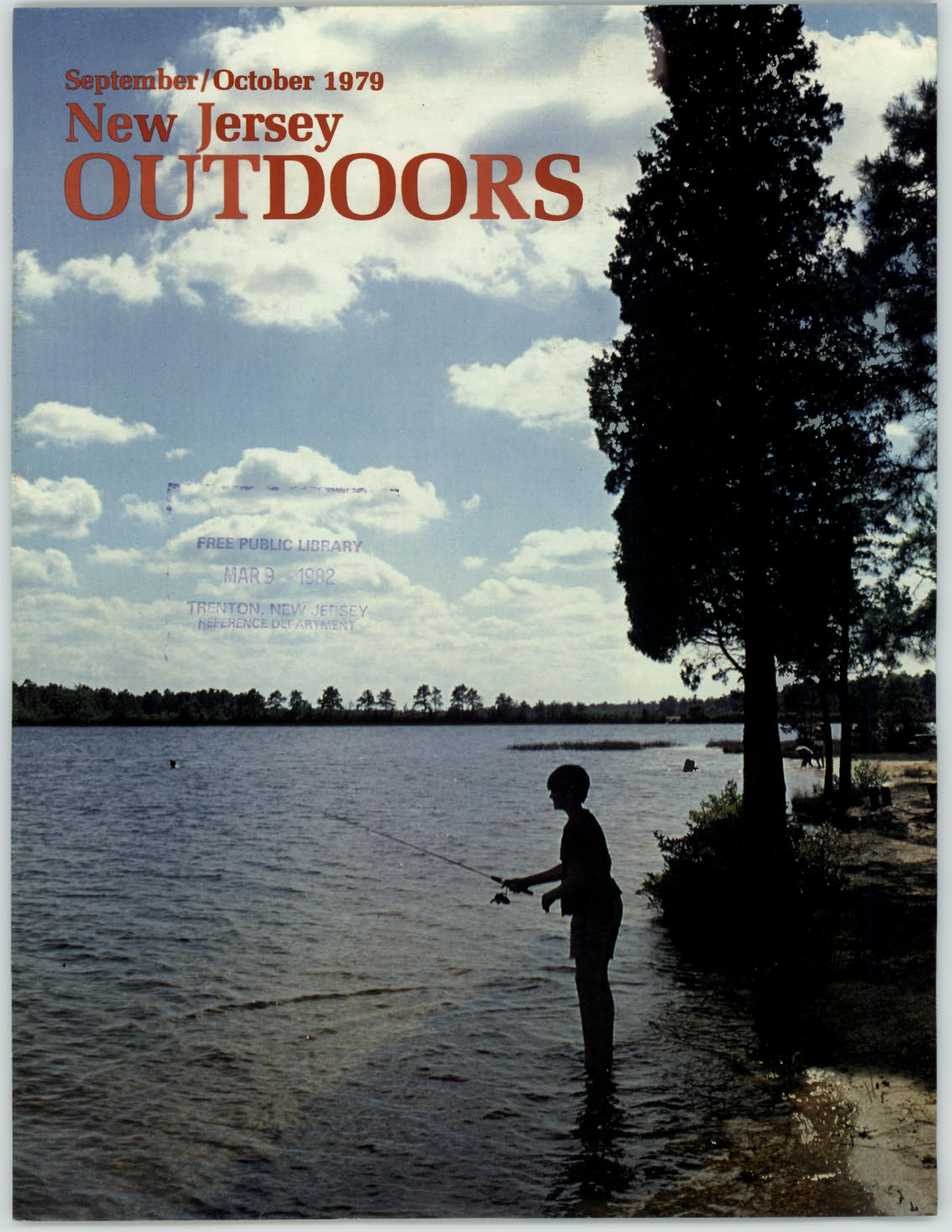
September/October 1979

New Jersey OUTDOORS

FREE PUBLIC LIBRARY

MAR 9 1982

TRENTON, NEW JERSEY
REFERENCE DEPARTMENT



State of New Jersey



Brendon T. Byrne
Governor

Department of Environmental Protection

Jerry F. English
Commissioner

Editorial Advisory Board

Al Toth, *Chairman*

Richard J. Sullivan

Irwin Zonis

Gordon A. MacInnes, Jr.

Gene Hill

New Jersey Outdoors Magazine

Steve Perrone
Editor

Harry Grosch
Photographer

Lucy Brennan
Circulation

Edi Joseph
Environmental News

Contributors

Bob Byrne

Roy Elicker

Joan Galli

Bob McDowell

Pete McLain

Sharon Ann Brady
Editorial Assistant

NEW JERSEY OUTDOORS is the bi-monthly magazine of the Department of Environmental Protection of New Jersey. This publication is dedicated to the wise management and conservation of our natural resources and to foster a greater appreciation of the outdoors.

(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.

New Jersey Outdoors (USPS 380-520) is published bi-monthly (six times a year) by the N.J. Department of Environmental Protection. Second-class postage is paid at Trenton, N.J. and additional mailing offices. Subscriptions are \$4.00 for one year, \$7.00 for two years, and \$10.00 for three years payable by check or money order to New Jersey Outdoors Mailing Office, P.O. Box 1390, Trenton, N.J. 08625. Single copies, if available, cost 80c. Change of address should be reported to the above New Jersey Outdoors mailing office. Send old and new addresses and the zip code numbers. The Post Office will not forward copies unless forwarding postage is provided by the subscriber. Allow eight weeks for new subscriptions and change of address to take effect. New Jersey Outdoors welcomes photographs and articles, but will not be responsible for loss or damage. Permission granted to reprint with credit to New Jersey Outdoors. Publication office at 3885 Quaker Bridge RD, Mercerville, N.J. 08619.

September/October 1979

VOL. 6. No. 5

New Jersey OUTDOORS

"Staying Alive" <i>By Wendolyn Tetlow</i>	2
The Wallpack Valley <i>By Norman B. Thompson</i>	6
The Who, Where, When and What of Hunting in New Jersey <i>By Joe Penkala</i>	8
Natural Dyes of Southern New Jersey <i>By Susan Grant</i>	10
More on Muzzle Loaders: Getting Started <i>By Fred Everson</i>	12
Zen and the Art of the Pine Barrens <i>By Jeanne C. Sutton</i>	14
Pine Barrens Moonshine <i>By Tom Reed</i>	17
The Historical Legacy of Three Village Churches <i>By Carleton V. Brairton</i>	18
Is This Really New Jersey?	22
Wildlife in New Jersey/ The Mourning Dove <i>By Bruce Hawkinson</i>	24
Marine Mammal Stranding Center <i>By Pete McLain</i>	27
"If You Love Lobster, You'll Like Tilefish" <i>By Susan Bonsall</i>	28

FEATURES

Guide to National Wildlife Refuges	16
More on Shad	16
Environmental News	16A
Wild Turkey Stamp Contest Winner	21
Young Waterfowlers	21

from the editor

A Fish Story . . .

Last year when the autumn winds became raw and blustery, I finally realized that summer had slipped by without saying goodbye and I didn't get to do as much fishin' as I said I would. But I say that every year—unlike Jim Moore.

For about a year or so I'd been hearing stories about this old black man who was catching whopper-sized channel catfish out of Dennisville Lake off Route 47 in South Jersey. These fish stories were carried to me by several Fish and Game biologists who had observed these catches and brought back some Polaroid prints to prove them.

So one sunny morning I decided to drive down to Dennisville and see for myself. I invited a photographer friend, Pat, and we picked up Freddie Ferrigno, the principal biologist at the MacNamara Wildlife Management Area in Tuckahoe. First thing Freddie said to me, "How can you be sure that he'll be there today?" I replied, "Freddie, you're one of the guys who told me he fishes there every day." We drove the short distance to Dennisville and sure enough Jim Moore had his line in the water.

I introduced myself to the slight angler with the large-brimmed high-crowned farmer straw hat and the faded tan overalls. He was surprised and pleased to hear that I'd heard about his fishing exploits "way up in Trenton." He said he had passed by this lake for more than 20 years on weekends

when he went fishing near the seashore with friends, always saying to himself that when he retired he would fish "that lake" everyday. And that's just what he's been doing.

I asked what he used for bait. He explained that he used worms for perch and freshwater cut bait for catfish, largemouth bass, and pickerel. He said always use freshwater fish bait for freshwater fishing. In the past several years he had caught more than 50 catfish, the largest weighing more than eight pounds. He also caught a six-and-a-half pound pickerel measuring 36 inches in length—that was the largest of many pickerel. He pointed to two floats bobbing in the water about 30 yards away and identified them as 40-50 pound test lines which he used to catch snapping turtles. He caught 17 snappers last year, three or four weighing 30 pounds or more. I asked, "What did you do with them all?" With a twinkle in his eye, he answered, "I ate 'em."

Before we left I asked, "Suppose I caught a couple of those channel cats—how would you suggest I cook 'em for a quick delicious lunch?" He said after you clean up a fish, roll them in corn meal, fry them, and steam fry them with onions. Then, he said, "Call me and I'll help you eat 'em!"

I'm writing this editorial in the middle of July although it won't be read until early September. This year I hope to get in some fishin' by that time. □

in this issue . . .

"*Staying Alive*" by Wendolyn Tetlow, a new writer, discusses the effects of environmental educational concepts on the young students at the School of Conservation in Stokes State Forest.

Wildlife biologist Joseph Penkala summarizes and analyzes the returns of the 1977-78 hunter harvest survey, a telephone questionnaire, similar to the Gallup Poll. Read *The Who, Where, When, and What of Hunting in New Jersey*, and the foregoing questions will be answered.

Is This Really New Jersey—our state as viewed through the camera eyes of several New Jersey photographers.

Author Fred Everson is back with *More on Muzzle Loaders: Getting Started*. If you're hooked on hunting with a front loader, then this article is required reading.

Our wildlife in New Jersey series *The Mourning Dove* by Bruce Hawkinson is introduced by the Carol Decker illustration on the inside back cover. The article is illustrated by Robert Pierro.

The Marine Mammals Stranding Center in Atlantic City has been involved in the salvage of some 60 stranded whales in the past two years. Author Pete McLain discusses the work of two biologists at the center, Robert

Schoelkopf and Shelia Dean.

A new author Susan Bonsall, of the New Jersey Marine Advisory Service, writes "*If You Love Lobster, You'll Like Tilefish*." This new deep-water fish with a lobster-like taste has provided a real boost to the local economy at Barnegat Light.

Another new author, Norman B. Thompson, writes about the picturesque beauty, the "yesteryear peace," the friendly craftsmen, the points of interest, and the areas to be explored in *The Wallpack Valley*. After reading this piece you'll want to journey to the northwest corner of our state to Wallpack Valley and visit such places as the nineteenth century town of Millbrook, Tillman Ravine, the Old Mine Road, Van Campen's Glen, and many other places of interest.

Still another new author, Susan Grant, writes about the *Natural Dyes of Southern New Jersey*. Ms. Grant includes "a list of dye-plants most valued by dyers past and present" and in the second half of the article instructs the reader on how to *Dye it Yourself*.

Carleton V. Brairton has been here before, but she's back with *The Historical Legacy of Three Village Churches*. Three central New Jersey


towns grew up around their churches: the Presbyterian Church in Basking Ridge; the Zion Lutheran Church in Oldwick, and the First Presbyterian Church in Mendham.

Zen and the Art of the Pine Barrens by Jeanne C. Sutton (another new author) is a different sort of article for our readers, a contemplative article. In fact, Zen is sometimes defined as "advocating self-contemplation as the key to the understanding of the universe." (and the Pine Barrens?) Ms. Sutton, a five-year resident of the Pine Barrens, shares her views, opinions, and "pure and curly-green contentments, that have grown from these views."

Believe it or not, *Pine Barrens Moonshine* by Tom Reed, still another new writer to our magazine, is about night hiking in the Pine Barrens. It's spooky—what with the Jersey Devil, the legendary witches of the Barrens, the werewolf of the Batona Trail . . . Try it on a moonlit night. □



New Jersey State Library



“...Staying Alive”

BY WENDOLYN E. TETLOW

The New Jersey School of Conservation

An Environmental Education Center

Fifteen of us—twelve fifth-graders and three adults—are standing beneath a hemlock tree at the New Jersey School of Conservation. Mountain laurel, rocks, and mixed deciduous trees stretch as far as the eye can see. Even though it is an autumn day, it is unusually cold, and rain is falling lightly around us, forming bright patterns on gold- and rust-colored leaves.

“What does the word *survival* mean to you?” asks one of the School’s resident instructors, addressing the group of students.

“Well,” volunteers a ponchoed 10-year-old, swinging an empty can to boil stream water for wild wintergreen tea, “It kind of means that if you’re out in the woods and get lost, you have to know how to take care of yourself.”

“That’s one way of thinking of survival, but I need a simpler meaning,” encourages the instructor.

“I know,” says another eager student, hopping from one foot to another, waving an arm in the rain, “it means just living.”

“Good,” approves the instructor, “it means *staying alive*. And we do that every day, don’t we, just by going to the refrigerator to get food. But today on our hike we want to search out some of the natural resources that enable us to stay alive. We want to explore our environment and try to understand some of the wonders around us—such as the air, water, natural food, and the things that go into providing clothing and shelter—and examine the relationship these things have to us as humans, and the effects we have on them.”

This basic ecological concept as presented to students of an elementary school in a course entitled “Survival” is just one example of the many exciting

ways in which the New Jersey School of Conservation presents its underlying philosophy. As stated in the School's *Teacher's Guide to Outdoor Education*, the purpose of its environmental studies program is to "...utilize the natural environment to cultivate in students a reverence for life through an ecological exploration of the interdependence of living things and to form in them a land ethic illustrating man's temporary stewardship of the land."

In 1949, as the result of actions by concerned educators and conservationists, the New Jersey School of Conservation was created to provide programs of conservation education for students and faculty members of the state colleges, as well as for students of New Jersey schools. Originally administered by the Department of Conservation (now the Department of Environmental Protection), the School of Conservation is currently the field campus for Montclair State College, operating under the auspices of the School of Professional Arts and Sciences.

Today, 30 years from its founding, the School of Conservation has grown from a small facility that offered courses to college students and operated a children's summer camp, to the largest resident center for environmental studies in the Western Hemisphere, attracting more than 10,000 students annually. Educational programming includes teacher training workshops, graduate and undergraduate summer courses, collegiate seminars, and sessions for public and private elementary and secondary school students.

Dr. John J. Kirk, Director of the School of Conservation since 1963, attributes the success of the School not only to the fine professional skills of the five-member teaching team whose accomplishments are known nationally and internationally, and whose continuity at the School has resulted in constant rapport among the staff and visiting teachers, but also to the creation and implementation of a sound teaching goal that affords each student an experience that can be applied to every day life for a better self-concept and for the betterment of the community.

For example, during a typical three-day period a student may be scheduled for sessions covering a wide-ranging curriculum; however, all ideas are presented in such a way that these separate subjects are integrated. During Action Socialization Experience (a session created by the School of Conservation in 1971 and now used at other environmental education centers throughout the United States) a group of students are required to organize as a team to master a given problem involving the use of outdoor obstacles. One such obstacle, for instance, is a six-foot-high, horizontal wooden beam that each member of a group must climb over, in a given amount of time, with only other team members to assist in the en-



6th Grade Students—going over the cargo net

PHOTOS BY AUTHOR



6th grade students on the climbing wall

deavor. This group effort—a favorite with students because of the camaraderie and team spirit it encourages—serves to build self-confidence and leadership within the individual student, which then carries over to subsequent sessions, as well as to future endeavors in the community.

Likewise, in Field Math a similar “unity of spirit” is again encouraged to help teams solve problems in measuring distance, or calculating the amount of water in a handful of peat moss, or figuring the amount of browse required to sustain one deer, or determining how many trees are needed to build one house. These calculations are then related to the individual student’s role in the biotic community: How much land and water does it take to support one human for one day and what is the impact of this requirement upon the natural world? “And what does Field Math have to do with conservation?” asks the instructor. “Things add up to make something...” responds an eighth grader, “...like all the years it takes for one tree to grow.”

Further sessions, falling into four areas of study (the humanities, social studies, natural and physical sciences, and outdoor pursuits) may entail sketching the many shapes and forms in nature; creating primitive music with natural objects; exploring a beaver dam; constructing simple weather instruments; learning to card wool and use a drop spindle; examining a local cemetery to learn of the area’s history; studying a stone wall for its many significances; penetrating the mysteries of a forest and its many uses; and discovering the secrets within a body of fresh water, to mention only a few. All sessions stress the importance of understanding how man is bound to his surroundings and how he alone can consciously alter the physical world around him. One special-education student who mastered the technique of spinning with a drop spindle during a session of “American Craft Heritage” said, “This is fun . . . I wish we could stay here longer.”

Outdoor pursuits are programmed according to the season: archery, boating, camping skills, fishing, hiking, orienteering, outdoor photography, rock climbing, curling, ski touring and snowshoeing. Most of these particular activities are offered not only because they use natural resources for recreation that is popular today, but because they reflect a past way of life. For example, snowshoes were used by American Indians as means of survival. Since they had to follow their food source, especially during the winter months, Indians developed a foot extender, which improved in design over the years to suit each tribe’s needs. Today outdoor enthusiasts use the same basic egg-shaped snowshoe (now called the bear paw) employed by the Indians thousands of years ago. Snowshoeing, like hiking, archery, fishing, and so on, is part of our heritage as a nation. Students at the



Teachers on the “Walk Through Time” geology trail

School of Conservation who participate in these outdoor pursuits learn how earlier man fit in with his environment.

Also available to visiting schools are persons from the State Forest Fire Service, the Bureau of Geology and Topography, and the Division of Fish, Game and Shellfisheries to conduct further programs related to environmental education.

Students are not the only ones to benefit from experiences at the School of Conservation. After Eco-Discovery (a self-guided exploration of the School’s facilities and natural habitat, involving the use of map and questionnaire), one teacher new to the School of Conservation said, “I can’t wait to get back and use some of these orientation procedures with my kids.”

Before teachers arrive at the School of Conservation with their students, they are encouraged to familiarize themselves with the School’s programs, and to assist in designing activities that are best suited for the interests and capabilities of their students. By acquainting themselves with the School’s offerings, teachers can develop classroom activities that prepare students for their experiences at the School. Most schools make reservations for a three- to five-day visit. Teacher-student ratio is one to ten, therefore groups are intimate and teachers are better able to maintain a closer relationship with the individual student.

Course offerings at the college level, graduate and undergraduate, usually run 10 days (with residence at the School) and may include such varied topics as “Introduction to Field Biology,” “Practicum in Environmental Education,” “Field Techniques for Teaching the Humanities,” and “Outdoor Recreation Skills.” The School of Conservation also offers a resident fellowship program whereby the student lives at the School, monitors sessions, and assists in teaching during an academic year, as well as satisfies



**6th grade students in a creative writing session
(160 year old Carriage House in background)**

classroom requirements on the campus of Montclair State College.

But the School of Conservation maintains relationships far beyond Montclair State College and the public and private schools of New Jersey. In 1972 the Osaka Youth Outdoor Activities Center and the School of Conservation were pronounced sister centers. Japan's center is the largest outdoor education center in the world. The Japanese have published a textbook on teaching the natural sciences that presents concepts employed at the New Jersey School of Conservation. The two schools continue to exchange ideas in curriculum development for the benefit of both.

Like her sister center in Japan, which is located not far from Osaka, the School of Conservation is 58 miles from Montclair State College, just outside of New York City. Originally situated on 35 acres of the former Skellinger Group Camp, a camp constructed by the Civilian Conservation Corps in the 1930s, today the School encompasses 240 acres ideally located within 25,000 wooded acres that comprise Stokes State Forest and High Point State Park in northwestern New Jersey. The rocky terrain and predominantly oak-hickory-ash woods support a variety of flora and fauna for students to study and enjoy. Lake Wapalanne, a small spring-fed lake, is used for recreation and water study. To the east of the School lies the Kittatinny Mountain, where instructors frequently lead hikes along the famous Appalachian Trail. To the west lies the Delaware River, used thousands of years ago by the Lenni Lenape Indians as a migration route to the sea. Students participating in social studies programs at the School can examine artifacts from these Indians and learn of their historical significance.

Facilities at the School of Conservation consist of two complete, rustic camps originally built by the Civilian Conservation Corps. Camp Wapalanne and

Camp Sequoya, which house 175 and 120 people, respectively, have sleeping and sanitary facilities. During the summer months Camp Wapalanne is operated for boys and girls between the ages of eight and fourteen who participate in natural-science and outdoor-recreation programs. Two outposts used by the camps house students in Dien Domes, structures that resemble Eskimo Igloos. Both camps utilize a nature center, library, infirmary, trading post, and large hall for meetings.

In keeping with the School's philosophy—that everything is inter-related, both natural and man-made—Dr. Kirk conceived of a project in 1973 that involved the reconstruction of a 160-year-old carriage house. Under the direction of their professor, who is recognized nationally in the field of historical reconstruction, students from Montclair State College dismantled the carriage house from the Tocks Island Dam area and relocated it to the School of Conservation. Employing traditional building methods in an effort to maintain historical integrity, students carefully replaced the wooden pegs that were used to hold the house together. Today the carriage house is used as a classroom for blacksmithing and to house the School's collection of colonial farm implements. It is one of three reconstructed buildings on the School's grounds.

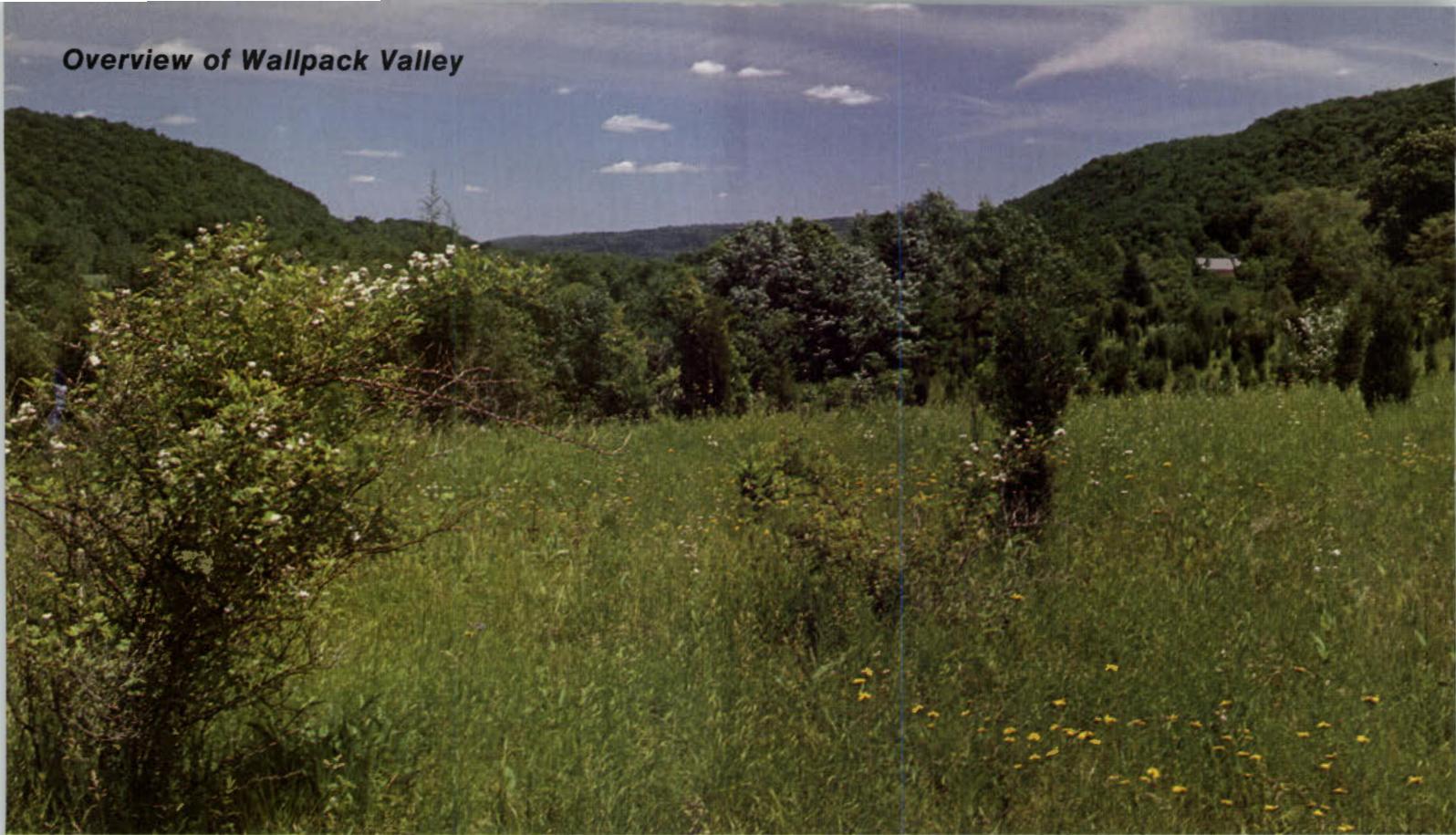
Other unique features, both recreational and educational, include a 23-foot-high wooden climbing wall; a confidence course consisting of rope ladders, Burma bridge, parallel ropes, and chain log; a geology trail that chronologically breaks down the earth's history by a series of stepping stones placed at measured distances; a plant succession observation area; an astronomy center; and a lapidary center.

New to the School of Conservation is a program that pre- and post-tests students to determine the influence of their experiences at the School. The results of this testing will assist the School's instructors in determining what areas of study need improvement.

Future plans for the School of Conservation include an increase in the number of teacher-training workshops, an expansion of college programs, and a better integration of graduate programs in environmental studies with other universities throughout the state.

Finally, the School of Conservation hopes to continue its relations with other countries in an effort to further an exchange of ideas to achieve a better world. In the words of Dr. Kirk, "... environmental education may prove to be the catalyst that not only saves the human race from extinction, but also may serve to unite all the people of the world in a common effort to find solutions to the perplexing and difficult problems that threaten life on the planet." "Staying alive" is an ecological challenge. □

Overview of Wallpack Valley



Text and photographs copyright Norman B. Thompson 1978

Buttermilk Falls



Van Campen's Glen



The Wallpack Valley

NORMAN B. THOMPSON

It had been a good weekend—canoeing with good friends on the Delaware. That pleasant tiredness that follows a day of physical exertion spread through my muscles and joints. As I started the long drive through northern Jersey toward Passaic, my mind turned to thoughts of a hot shower and dinner. Unfortunately, I was not the only one heading home that Sunday evening: Route 206 was packed with Jerseyans heading back from their Pocono retreats. As traffic ground to a halt, I decided to take my chances on the back roads—better to be lost and moving than knowing where I was and sitting.

I soon found myself driving down a narrow valley. The mountains on each side were covered with trees. Cattle grazed in pastures along a winding stream. I drove past a couple of tiny towns with neatly painted white houses

lining the road. These were not vacation homes. This was not a resort. There were no hotels here—not even a gas station. It was near sunset. The sky was turning pink. A hazy mist was forming in the valley. I felt that I had stepped into a fairytale land. My feelings were a mixture of excitement at finding such a beautiful place and a tremendous calm that radiated from my surroundings.

Since that evening several years ago, I have been back to the area many times. I have explored by car and on foot. I have visited historic houses and towns, and have hiked to places frequented only by deer. I have visited craftsmen and farmers at work. People are always friendly and interested in taking time to talk. Each time I go, I discover new things to see and new people to talk to.

No single geographical name seems to be used for the valley. It is the valley of the Flatbrook, but no one seems to call it that. It is generally known as the Wallpack Valley (also spelled Walpack). The name apparently comes from the Indian wahlpeck, meaning whirlpool, or walpeek, meaning deep water. Most of the area has been bought up by the federal government to become part of the Delaware Water Gap National Recreation Area, which encompasses land on both the Pennsylvania and New Jersey sides of the Delaware River from the Delaware Water Gap north to Port Jervis. Much of the rest of the area is State

Forest and State Wildlife Management Areas. Almost all of the few summer homes built in the area have been torn down or moved; park employees live in many of the remaining houses. A few homes and farms are still privately owned and others are leased back to their original owners. The City of Passaic leases a former Boy Scout camp and a 150-year-old farm as part of an alternate education program.

Original plans for the Recreation Area encompassed a reservoir to provide flood control, a water supply, and hydroelectric power. A dam was to be built at Tocks Island on the Delaware, about five miles north of the Water Gap. In 1966, the Army Corps of Engineers began acquiring the land which would be flooded—this included much of the Wallpack Valley. Surrounding this reservoir was to be the National Recreation Area, made up of land being bought up by the National Park Service. Environmentalists, outdoorsmen, and local residents objected to the dam construction, with the result that the start of construction was continually put off; the fate of the area remained in limbo for many years. Finally, the National Parks and Recreation Area of 1978 declared the Delaware a National Scenic River, thus affording it protection from damming. This law has put a *de facto* halt to the Tocks Island Dam construction.

We can only conjecture at the early

Continued on page 26

THE WHO, WHERE, WHEN, AND WHAT OF HUNTING IN NEW JERSEY

BY JOSEPH PENKALA

ILLUSTRATIONS BY
ANTHONY HILLMAN



Wide choice of weapons

Who hunts in New Jersey? What do they hunt for? How successful are they? Where do they hunt? When do they hunt? How often do they hunt? All these questions are of great interest to the wildlife manager. The hunter is the prime user of the wildlife resource. He is also a primary factor in its management. An understanding of the hunter and his activities aids the wildlife manager in making the decisions that ensure the wise use of this natural resource.

For the last 20 years the Bureau of Wildlife Management of the New Jersey Division of Fish, Game and Shellfisheries has been conducting hunter harvest surveys in an attempt to answer these questions. From 1959 to 1974 the information was gathered by a mail survey.

Thousands of questionnaires were sent to hunters each year. The hunters mailed back their responses to the questionnaire on a postpaid card. In 1974 the survey was changed to a telephone questionnaire, similar to the Gallup Poll, in which sample group of hunters were called and asked a variety of questions about their hunting activity. The data obtained from the survey is used to guide management decisions.

The results of the 1977-78 hunter harvest survey are typical of those that have been collected over the years. We think that you will find the answers to our "Who does what?" questions interesting and informative.

WHO HUNTS IN NEW JERSEY?

The average New Jersey hunter is male and between the ages of 20 and 40. He is a blue-collar worker who owns his own home and whose annual family income is under \$20,000.

In most cases he is the only hunter in his household. While this description fits the "average" hunter, it is no characteristic of all hunters.

Hunting tends to be a male dominated sport with 99% of all participants being male. While most hunters are in the 20-40 age category, hunter ages range from 10 years to the middle 80's. Blue-collar worker is the most common general category of occupation, followed by white-collar, self-employed, and retired. The annual incomes of these people range from \$5,000 to well

over \$20,000.

Hunters come from all counties of the state. Urban counties tend to have fewer hunters than suburban and rural counties.

WHAT DO THEY HUNT FOR?

New Jersey has a wide variety of hunting seasons. No matter what your preference, you should be able to find a season to suit you. Some of the state's hunters are jacks-of-all-trades, hunting a variety of game with a number of different weapons. Others are purists and devote all their time to a specific kind of hunting. Considering the 150,000 to 160,000 firearm hunters and 36,000 bow hunters in the state, the list of preferences is long.

Small-game firearm hunting is the most popular, with an average of 123,000 participants. Of this total number of small-game hunters, 80% pursued rabbits and pheasants, 40% squirrel and quail, and 30% grouse.

Firearm deer hunting is the next most popular type with 107,000 hunters out during the firearm buck season, 20,000 on the either-sex day, and 2000 active during muzzle loader season. Archery deer is next with 36,000 participants, followed by waterfowl hunting with 35,000. Woodchuck hunting has a following of about 7000 hunters. Other types of hunting with lower levels of participation are clapper rail, crow, raccoon, and fox hunting.

While these are the numbers of hunters participating in a particular type of hunting, the Garden State sportsman is primarily a jack-of-all-



80% of hunters pursue rabbits and pheasants



trades, or a hunter for all seasons. Eighty-seven percent of all small-game hunters are also firearm deer hunters; 75 percent of all archery deer hunters also hunt with firearms; and 50% of all duck hunters also hunt small game and deer. The question in New Jersey is often not whether to hunt but rather what to hunt for.

HOW SUCCESSFUL ARE THEY?

The satisfaction and enjoyment derived from hunting is a complex entity. A whole host of different factors come together to make an enjoyable day afield. One of these factors is the game harvested. The harvesting of game is central to and the essence of the hunting experience.

During the 1977-78 season an estimated 370,000 pheasants were taken. The average bag per hunter for the season was 2.3 pheasants.



Not many mudhen hunters

About 689,000 rabbits were also bagged, with a season average of 4.4 rabbits per hunter. A reported 242,000 squirrels were harvested—an average bag of 1.6 per hunter for the season. An average bag of .96 quail per hunter and a total harvest of 150,000 was reported. Fifty thousand ruffed grouse were bagged with an average per-hunter harvest of .32. Waterfowl hunters harvested a total of 223,000 ducks for a season average of 9.3 ducks per hunter. Among firearm deer hunters, one in fifteen was successful, among archery deer hunters, one in seventeen. The total deer harvest for all seasons during 1977-78 was 14, 419.

All these figures are more impressive if we keep in mind that New Jersey is the most densely populated in the country. Although substantial amounts of wildlife habitat are lost each year, the remaining habitat still supports healthy, viable wildlife populations. As long as the habitat can be preserved, wildlife has a future.

WHERE DO THEY HUNT?

Each of the 21 counties in the state provides some hunting opportunity; of course, the rural counties provide a good deal more than the suburban and urban ones. Hunterdon, Sussex, and Morris are the most heavily hunted counties in the north and Burlington, Cumberland, and Gloucester are the most heavily hunted in the south. Rapidly suburbanizing counties such as Monmouth, Middlesex, and Ocean still provide a large amount of hunting

opportunity.

Most hunting in New Jersey is done on private land. This is understandable, since most of our open space is in private ownership. However, public land provides a significant amount of hunting opportunity. The 150,000 acres of Fish and Game operated Wildlife Management Areas, certain state forests, parks, and selected federal lands comprise the majority of public open space available for hunting. With the continued development of private land in the state, these public lands will become increasingly important to the hunters of the Garden State.

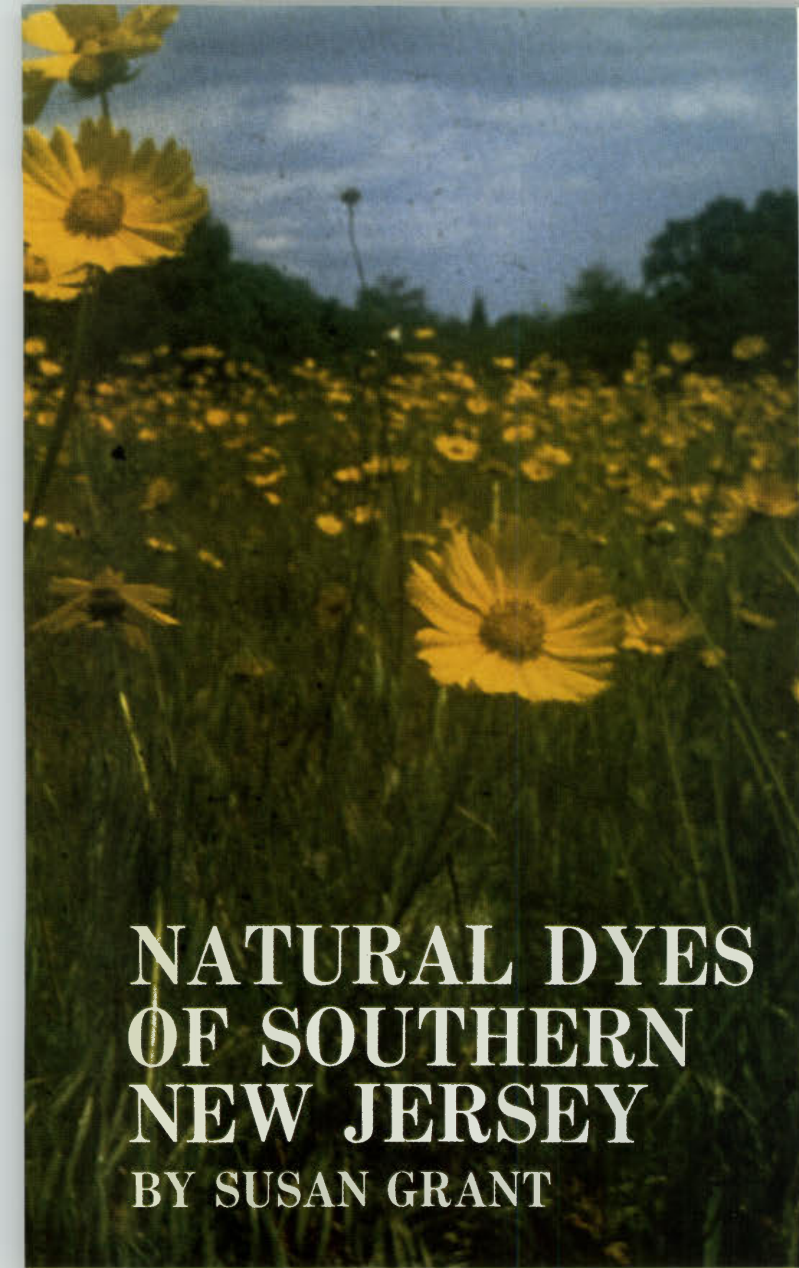
WHEN DO THEY HUNT AND HOW OFTEN

Most hunting activity takes place between the opening of archery deer season in October and the end of firearm buck season in December. Within that period, Saturdays and holidays are the most popular days to hunt. Opening days are a real phenomenon. The most intense activity is noted on the opening day of any season. The cultural tradition for this response reaches deep into the roots of the sport.

The average firearm hunter is active for nine days per season. If the hunter is also a bow hunter, he is active for an additional four days.

During the 1977-78 season, hunting in New Jersey provided a total of 1.8 million man-days of recreation.

This is just a sample of the information collected each year by the Bureau of Wildlife Management concerning New Jersey's wildlife and its users. The research effort of the bureau is extensive—in a rapidly urbanizing state like New Jersey, it must be. The wildlife resource has to be carefully and professionally managed if the citizens of the state are to enjoy the maximum economic, recreational, and aesthetic benefits that the renewable wildlife resource has to offer. A constant cooperative effort between the Division of Fish, Game and Shellfisheries and the sporting and interested general public is necessary if New Jersey's wildlife is to have a future. □



NATURAL DYES OF SOUTHERN NEW JERSEY

BY SUSAN GRANT

Closeup of *Coreopsis lanceolata*

PHOTOS BY AUTHOR

Any plant will dye plant or animal fibers when they are simmered together in a pot of water for 30 minutes to an hour and a half. With more than 1500 species of plants in New Jersey (not counting fungi), the natural dyer may not be able to see the forest for the trees. Historically, a few plants have been singled out because of their reliability, easy processing, and availability. Using Witmer Stone's boundaries for an area he defined as "Southern New Jersey" at the beginning of this century, I have put together a list of dye-plants most valued by dyers past and present, and I have noted the few whose existence is threatened in our area by development and destruction of their habitats.

There were two types of dyers in the original colonies—the commercial producer and the home dyer. Commercial dyers imported their technology from Europe, and often imported materials to match,

despite the expense, making little use of native plants until after the American Revolution, when economic independence became a necessity as well as a virtue. Then agricultural associations began encouraging large-scale cultivation of dye plants in earnest, and Thomas Jefferson and Dolley Madison pushed a home dyer's version of the Victory Garden; neither effort met with lasting success. Home dyers tended to make more use of local plants because they needed dyes only sporadically and in relatively small quantities, and because their budgets were small as well.

Back then, both commercial and home dyers on the East Coast had little luck with reds and blues. Indigo, *Indigofera tinctoria*, is a legume justly famous for its blue dyes, although the pigment is not water soluble—a singular exception—and must be nursed carefully through an alkali solution. A native of India and Egypt, it was cultivated on the East Coast of the United States until the abolition of slavery made it uneconomical because of the enormous hand labor involved in harvesting and processing the plant prior to dyeing. The powdered indogotin pigment can be purchased today, as well as a synthetic version of it. Wild Indigo, *Baptisia tinctoria*, is a member of the *Indigofera* family found in our areas; it is inferior as a dyeplant, and not worth the trouble.

Purists will also have to mail-order reds unless they cultivate madder, *Rubia tinctorum*, a plant of European origins which some early settlers included in their gardens. After three years of undisturbed growth, the roots are collected and chopped or ground, and yield a brilliant series of reds. Many of the wild bedstraws or cleavers, a subfamily of the *Rubiaceae* family, are often mistaken for madder; we have 11 species here, with 3 on the endangered list; no matter, none are any good whatever for red dyes. The alien *Galium mollugo* was introduced by Thomas Jefferson, who was disappointed with its performance.

Bloodroot, *Sanguinaria canadensis* (also called Sang-Dragon, or Red Puccoon), is a rhizome of rich woodlands whose bulbs have a yellow stain that Indians made lavish use of on their bodies. As a red dye, it is less successful; the pale shades it produces are only temporary, despite frequent claims to the contrary in dye texts.

Pokeberry, *Phytolacca americana* (Inkberry, Pokeweed, Scape, Garget, Pigeonberry) is another frequently cited source of red. It does occasionally grace fibers with a fleeting red before settling down to a ho-hum tan or dishpan gray. Only gorging grackles shooting from pokeberry bushes to clotheslines seem to have mastered the dye chemistry for permanent reds with this ubiquitous plant.

Yellows, however, we have in great abundance and variety. Black Oak, *Quercus velutina* (Yellow-Barked Oak, Quercitron), is "... the indigenous American dyestuff ..." and was our big contribution to the

international dye scene before synthesized colors. The inner bark of the tree trunk contains dye pigment and as little as 4 oz. can dye a pound of wool a bright and brassy yellow, without additional mordants or modifiers. Black Oak bark was also used in many compound dyes for drab, smoke, oliver, snuff, oranges, yellowed-reds and cinnamon brown, on cottons and silks as well—materials quite difficult to dye. When collecting bark, care must be taken to avoid girdling the tree, which can be found in dry woods, and bottomlands; a lifetime supply of yellow can be had from two or three trees.

Smartweed, *Polygonum persicaria* (Arsemarkt, Buckwheat, Lady's Thumb, Heart's Ease) is a pervasive alien on clearings, roadsides, and cultivated areas. When the plants were blooming, the leaves were picked, dried, and then soaked for several days to induce fermentation. The liquid was drawn off and heated and alum-mordanted cloth was added. Other polydonums probably would produce similar colors; Jefferson experimented with *Polygonum sagittatum* (Arrow-leaved Tear Thumb, Arrow-Vine), a late-summer bloomer found in swampy areas of southern New Jersey.

Goldenrods are present in 23 glorious varieties in our area; but three, *Solidago elliotii*, *S. rigida*, and *S. stricta*, are endangered. An impressive array of light-fast and washfast colors can be made from the 20 common goldenrods, using the flowers and leaves together, fresh. The abundance, vigor, and reliability of goldenrod should have made it extremely popular commercially, but it was ignored except by domestic dyers. A full range of yellows, golds, bronzes, greens and browns can be obtained with goldenrod and mordants and modifiers, making this plant a basic one in the dyer's palette.

Dock, *Rumex verticillatus* (Sorrel, Peterswort, Patience, Swamp or Water Dock), was widely used by home dyers for yellow or as a component of other colors. The leaves and roots of most members of the *Rumex* family could be used with predictably similar results.

White Ash, *Fraxinus americana*, was a yellow standby; you could count on it "... green or dry, boiled or simmered. . . ." Because of the extra toughness of the bark, Mockernut Hickory, *Carya tomentosa*, was also used on a substitute-only basis—commercially neither tree could compete with Black Oak for easy processing.

New Jersey Tea, *Ceanothus americanus* (Buckthorn), was well-known as a pseudo-tea during the American Revolution; its berries, when combined with a copper mordant, created a fine stable yellow. Other colors from other parts of the plant were surprisingly fugitive.

Sassafras, *Sassafras albidum*, a familiar tree of woods and thickets, was reported by Peter Kalm, an

early botanist, to give an exceptional orange when used in brass pot with water, urine and wool. Without the urine, you'll have to settle for a dull brown or ash from the twigs, bark, and roots. Early dyers used it as another tannin substitute as well.

Coreopsis has a number of species: *Coreopsis rosea* is the only one native to southern New Jersey and now this Rose-Colored Tickseed is on the endangered list. *C. tinctoria* was the most widely used in the past for variations on a theme of yellow to near-red. The alien garden escapee *C. lanceolata* is alive and well throughout the East and makes an excellent dye. Blooming from May through July in dry, sandy, open areas, its flowers can be plucked and used fresh or dry without any loss in quality or quantity or coloration.

Queen Anne's Lace, *Daucus carota* (Wild Carrot, Devil's Plague), is described in *Gray's Manual of Botany* as a "pernicious weed" but it can be harvested for its delicate yellow and yellow-green dyes. Mullein, *Verbascum thapsus* (Flannel Plant, Torchweed, Hag Taper, Parson's Staff), produces the same quiet yellows, either from the preblossoming tops or the whole plant, minus the roots.

The Milkweed family, *Asclepiadaceae* (Silkweed), has 12 members in our locale; *A. variegata* is endangered, Whorled Milkweed, *A. verticillata* and Smooth Orange Milkweed, *A. lanceolata*, have an undetermined status; Red Milkweed, *A. rubra*, is rare. At times, stems were used for fiber production; dyers can cull the leaves, flowers, and stems of the remaining eight species, which are found in a wide variety of habitats, and can be used for a series of gentle yellows.

Other noteworthy yellow-dye plants are:

Beach Plum, *Prunus maritima*—the most common wild plum in southern New Jersey, branching out on dunes and sandy spots; the leaves were collected for yellow dyes.

Bayberry, *Myrica pensylvanica* (Waxberry, Candleberry)—from the leaves came yellow, or, with copper as a modifier, an olive-gray. This common shrub is better known for its waxy berries used in scented candles and soap.

Tupelo, *Nyssa sylvatica* (Black Gum, Sour Gum, Pepperidge)—a tree of low, acid woods, swamps, or shorelines, whose bark was collected for yellow-tans with alum mordants.

Chamomile, *Anthemis tinctoria* (Golden Margeurite)—an alien flower blooming from June through September which makes a mellow tea as well as yellow dye.

Common Tansy, *Tanacetum vulgare* (Golden Buttons)—a vigorous dyeplant, introduced from Europe where it had medicinal value as well as a reputation for dyeing a sturdy range of yellows, bronzes, golds, and gray-greens with mordants and modifiers.

Continued on page 29

More On Muzzle Loaders:

GETTING STARTED

BY FRED EVERSON

If you are one of the many unfortunate hunters who missed out on the New Jersey's first muzzle-loader deer season last fall and plan to make amends this year, the time to get started is now. If you do not already have a rifle permit, the first thing to do is apply for a hunter education course. The only requirement is that the applicant be at least 18 years old. The application form can be had from any licensing agent, or by writing directly to the Division of Fish, Game, and Shellfisheries, P.O. Box 1809, Trenton, N.J., 08625.

By applying now, you will most likely get into the earliest course available. This should allow just enough time to complete the course, take the test, and get your Special Permit application in the mail. You may apply for the regular Either Sex Deer Permit or the Muzzle Loader, but not for both. The number of permits available last year for the three-day muzzle-loader season exceeded the number of applicants by nearly 4,000! So your chances of receiving a permit are excellent.

If you have already obtained a rifle permit, or if your application is in the mail and you do not own a muzzle loader, you should start shopping. But be careful! As interest in muzzle loading began to grow a few years ago, many companies rushed to meet the demand with cheap guns whose only real purpose is to decorate the mantelpiece. A bit of research on your part will help you to avoid making any mistakes in your selection, and assure you of buying a solidly built, functional shooter that has been designed for the rigors of hunting.

Once you have decided on a reputable gun manufacturer, you must choose a suitable caliber. While .44 is the minimum legal caliber in this state, experienced black-powder shooters will tell you that it lacks punch. I am not saying that a .44 or .45 will not do the job, just that a .50 caliber gun will do it better. It is a simple matter of physics.

A wider selection of bullets is also available for the big-bore guns. The Maxi-ball, a modern bullet by Thompson/Center, comes in .45, .50, and .54

caliber. It is an oversized bullet that does not require a patch and loads relatively easily. Although you should have a ball starter, this bullet can often be started with a great deal of thumb pressure. Once the rifling has engraved the bullet at the muzzle, it goes down smoothly. The only mess involved is in lubricating the sides of the bullet, but this can be done beforehand in the comfort of your home.

Also available in a wide range of calibers is the Minie-ball, an undersized projectile with a hollow base that expands into the rifling when the gun is discharged. This type of bullet was the standby of both sides in the Civil War because of its ease in loading and its inherent accuracy.

While the patch round ball is cumbersome and more difficult to load, there is much to be said for it. Certain guns will shoot the lead spheres much better than any other type of bullet, and as they are considerable lighter than elongated bullets, they have a higher velocity and flatter trajectory.

The aforementioned difficulty in loading is due to what we call "fouling." Black powder is messy stuff and leaves a residue in the barrel each time the gun is fired. Since this fouling builds up with each shot, an occasional swabbing of the bore is necessary. A patch saturated with alcohol does this job nicely.

Another consideration in your purchase will be the type of lock. If you want a gun that you can also use in neighboring Pennsylvania, it will have to be a flint lock, as that is the only type of ignition permitted there for the muzzle loader. Otherwise, the percussion lock is the only way to go. The flintlock is actually better suited to the advanced muzzle-loading shooter. The percussion caplock is much easier to work with and not as susceptible to wet weather as the flint. The hooked breech is another desirable feature to look for as it allows you to remove the barrel for a thorough cleaning. As black powder is extremely corrosive, this is an important consideration.

In addition to factory-finished rifles, there are many kits available. These kits are designed for people who like to work with their hands and not for those who want to save money.

Along with the gun, you should also have the appropriate accessories. A ball starter, a power measure, a spare ramrod, a spare nipple, and a nipple wrench are the bare essentials. A leather pouch to carry all of these lends an authentic touch, as does a flask or power horn. You will also need a pound of "Double F" black powder, or rifle-grade Pyrodex (a modern substitute black powder—if you can find any), percussion caps of the proper size, bullets, patches (if you are going to shoot round ball), a lubricant, and a powder



A few trips to the rifle range are needed to get the most out of your muzzleloader

PHOTOS BY AUTHOR



The half-stock, "Hawken" type rifle is once again riding a crest of popularity

solvent with which to clean the gun. Only after you have accumulated the recommended gear should you attempt a trip to the range.

The biggest difference between shooting a modern center fire rifle and a muzzle loader is the number of variables. Patch thickness, different brands of caps, lubricants, and even loading procedures will all affect your gun's accuracy. Shooting a muzzle loader is a complex process of finding out what works best in your gun, and that is likely to take a few outings.

A good place to begin is with the minimum legal powder charge of 50 grains. Try a five-shot group at 25 yards with this load. Increase the charge by five grains and try another group on a clean target. Repeat this procedure until you have

reached the manufacturer's maximum recommended load. Go back over the targets and pick the best group and you will know your rifle's most efficient load.

Sound easy? Well, not quite. If you do not get any kind of group at all you will have to make other changes. Try different bullets, thicker patches, other lubricants, or even a different brand or cap. Keep experimenting until it works—that is what muzzle loading all about.

Even the loading procedure affects accuracy. Try to be consistent in each step of the process, doing things the same way each time.

Always snap a few caps before you actually load a charge, to make sure the nipple is free of oil before you ram a ball down the barrel. Some shooters even pour 10 or 15 grains of powder when snapping the caps to burn any oil out of the barrel. This done, set the hammer at half cock. Pour a charge from your horn *into the measure*. Never pour powder directly into the muzzle from a flask or horn. While they may get away with this trick in Hollywood, it is very dangerous in the world of real guns. A lit ember left in the barrel from the previous shot could sent the entire flask up in smoke and you with it.

Take care that the muzzle is pointed safely away from your face as you pour the measured charge into the barrel. Tap the butt on the ground lightly to settle the charge. Now start the ball or bullet in with the short starter, if necessary. Use the ramrod to drive the ball down the rest of the way, being careful not to pound it out of shape, as this will reduce accuracy. Make sure that the ball is seated firmly on top of the powder charge. When you are sure that the ball is properly seated, mark the ramrod where it comes flush with the muzzle. This will let you know that your bullet is where it should be each time you load your gun which in turn will add to your consistency and improve your accuracy.

Although I have barely begun to discuss the subject, the information contained herein should be enough to get you started in the sport of muzzle loading. It may sound like a lot of time and effort, and it is. However, should you choose to get involved, you will find that shooting a muzzle loader can be addictive.

Hunting with a front loader is a thrill that any hunter would enjoy. The thought of downing a deer with a gun like the ones that made legends of Crockett, Boone, Carson, and Bridger is almost reward enough. And what better way to recall what was once a way of life in America, than to practice the art of hunting with a muzzle loading rifle? It is an important experience than anyone with a sense of history will surely appreciate. □



Zen and the Art of the Pine Barrens

By Jeanne C. Sutton

DAVID M. CAMPIONE

It's my opinion that the prime value of New Jersey's Pine Barrens lies in the way they express the art of Zen. "Zen" is one of those words everyone's heard—but no one knows very much about. The "Pine Barrens" are two of those words everyone's heard—but no one knows very much about. "It's my opinion" are three of those words everyone's heard—and generally don't care very much about.

If that's the case, why am I writing this at all? I don't claim the botanist's eye, or the biologist's. I'm not the voice of the politician, or the real estate agent. I don't have a membership in the Sierra Club or even a commitment to some esoteric-sounding religion.

What I do have is five years' worth of roots sunk in a section of New Jersey known as the Pine Barrens. I'm writing to share both the view I've had from here and the opinions, convictions, not to mention pure and curly-green contentments, that have grown from these views. I'd like to add to the images you may already see, the information you already have, whether you've been here or not. And if the affinities, links, connections, I trace between Zen and the Pine Barrens should make even a small case for caring about such things, well, then, that'd be okay with me.

I suppose as good a place as any to begin is at my house. It was built 30 years ago on land offered at a premium with subscriptions to a Philadelphia news-

paper. There were bungalows here already, scattered along the edges of a dredged-out cranberry bog, but the end of World War II saw the first real year-round development.

The builder made it one story high, then put half-logs on the outside walls, three bedrooms and two bathrooms inside, panelled it in wood, and put a fat, brick fireplace in the living room. He lived here with his family for the rest of his life, until his widow sold it to us. The community is now call Lake Pine (honest!), named after its prime feature, the ex-bog turned cedar lake, a mile-long, 50-foot-wide strand in the tight-woven, self-contained watershed known as the Pine Barrens.

Coming as I did, from seven years of wandering through the thickets of South Jersey apartment living (I've heard—and believe—that the population density in some of these "rental zones" exceeds that of, say, New Delhi) our just-under-an-acre lot was a revelation. It was also very accessible. Right from the start.

The names I learned—scrub oak, pitch pine, short-leaf pine—were as simple, straightforward, and unvarnished as the trees themselves. There were holly trees, too; then, first thing in the spring, here came these incredible ferns! Having seen these most ancient plants only at the florist's, I was totally unprepared for the way they made their appearance. First, a nickel-width circle of hairy, pale spokes, ending in flat coils, would poke through the pine needles, or grass, or moss under my feet. The coils unfolded fast enough, it seemed, for my naked eye to see, into parallel sets of damp, furry teeth. These dried and flattened and grew taller and wider until, pretty soon, no matter what direction you looked you'd see these huge, green, waving flags.

Then the lilies of the valley and violets (white, and lavender, and purple!) started blooming in every available space. It got so I couldn't wait to see what else had come with the territory.

More surprises! The bushes dotting the yard produced, besides neat, smooth, green leaves, thick clusters of an apple-blossom kind of flower called mountain laurel. The bushes along the back boundary (where the land starts sloping towards a still-unredged bog) dropped their tiny white flowers, held onto their beady centers, and turned them into blueberries. That we could pick. And eat!

By the time we cut holly for holiday decorations, there'd been so many unexpected pleasures that I was really looking forward to the "second season." I've had five now. Each one's brought adventures. Together, they make a kind of chronicle, a real-life history:

Getting the car "set," stuck in what's called "sugar sand" here, exploring at dusk near a ruined iron-master's mansion.

Living close enough to hear the fire that took a 200-year-old cranberry "house" turned private school, into history.

Being allowed to know (on his terms, not mine) a Pine Barrens native, who was a whole, old man.

Fantasizing at the Carranza monument (a place looking very much like a monument to the Barrens themselves) about Lindbergh, who, 50 years ago, completed his goodwill flight to Mexico; and Emilio Carranza, who died trying to return the...favor? Challenge? Compliment?

Driving through the "dwarf" forest—which is a medium-long stretch of very short trees on the way to the Jersey shore. So many people must pass them by, thinking they've been burned out, reseeded, and never know that such smallness is an evolution they cling to, a smallness science hasn't figured out yet.

Ha! Even as I sketch these things on a thumbnail scale, I find I'd like to expand them, tell you in minute detail what it *really* was like, how it *really* went. I can't do it, though. Why?

Because I'm headed, you'll recall, for Zen, for the dead-center essence of the Pine Barrens. If I tried to use my tales, top-heavy with ego, to take you there, it would mean a probable failure to arrive. So I'll share just one more ego-trip with you. Partly because it was a family outing "to the end of the world"; but mostly because I came back from that particular adventure having experienced what in Zen is called "satori."

"The end of the world" is actually quite accessible. It lies along Route 532 in Burlington County, about a mile and a half from where it intersects Route 72; none of which will speak to you unless you've been there—or memorize maps. If you should ever find yourself close enough, though, you can't miss it.

We rounded a bend in the road and there, dead ahead, was a sudden, incongruous hill. It rose straight up before us, exactly halfway into the sky.

Everything seemed straight lines and equal measures. The power poles shrank in size as they neared the hilltop. The tree line was spiked with mast-high cedar trunks, above a sea of solid, squat green pine. Clean blue sky butted against the trees, then notched into the T-square leg of the road dividing the hill in two.

The sky seemed to reach even higher as we began to climb the road. Something in me accelerated with the car. Even close to the crest, the sight stayed the same: so neat, so clear, no glimpse, not a single hint of what lay on the other side. I found my head emptying of judgments, words, thoughts. My vision fixed, focused straight ahead, on the point where the road reached the horizon.

An image flashed. Years ago I was a kid watching television. Dave Garroway closing his show; peering over his glasses, saying in a calm, friendly voice:

The world stands out on either side,

*No wider than the heart is wide,
Above the world is stretched the sky,
No higher than the soul is high.*

And there I was. Transfixed. About to be enlightened. The spinning wheels of my left brain—logic, analysis, the whole "I think, therefore I am" business—dissolved into "I am, therefore I am." Only it wasn't a thought. It was, rather, my right brain, knowing, in its intuitive, nonverbal, irrational way. A quantum leap of awareness. Smack into the now.

What happened was a rare, peak moment. What's more, the moment was sufficient as itself. I not only "got it," I *was* it, simple as that. And as complicated. What happened was satori (enlightenment). We crested the hill to find that the other side fell away in a long, easy series of little swells, covered with that pine security blanket, laid on white sugar sand, fuzzy, green, accessible. Not a bad place for the world to end.

Today, years later, that Western, left-brained, "I think, therefore I am" mind-set is still a firm part of me. But the Zen-side, if you will, that Eastern, right-brained "I am, therefore I am" soul-set, is, I've discovered, a firm part as well.

I've learned that zen is much less strange than its name-label suggests. Zen is not religious doctrines or philosophy, culture, or art—though you can find its tracks, its traces in all these places. Zen is not meditation, self-awareness, laughter, or enlightenment either—though you may experience these things. Zen is a soul-set rather than a mind-set, a kind of "inner game" of life, in which both your feet can remain firmly planted on the ground, so long as that other side of your mind, the non-word, non-idea side, is allowed to play as well.

A Zen life view allows all life to flow through in all its forms, meeting it with an openness not just of thought, but of being.

Zen is less foreign a country than we might suppose. Take, for instance, these words of an eighteenth-century Japanese poet:

*Coming and going, life and death:
A thousand hamlets, a million houses.
Don't you get the point?
Moon in the water, blossom in the sky.*

And, again:

*Does one really have to fret
about enlightenment?
No matter what road I travel
I'm going home.*

In my case, home means the Pine Barrens, where I have come to see the tracks, the traces, of the art of Zen.

"A thousand hamlets, a million houses"—that sounds like right here. Malls, crime, stress, commuters, offshore drill-rigs, sonic booms, "for sale"

Continued on page 20

book review

GUIDE TO THE NATIONAL WILDLIFE REFUGES

How to Get There
What to See and Do
LAURA AND WILLIAM RILEY

Two New Jersey national wildlife refuges are featured in a new book, *Guide to the National Wildlife Refuges* by Laura and William Riley, published in July by Doubleday and Company. They are Brigantine and Great Swamp.

Division of Fish, Game and Shellfisheries

More on Shad



1979 Delaware River Shad Run

Spring river flow conditions were ideal for the passage of American shad through the pollution block. This year's adult shad spawning run is regarded as the best run since 1963. Scattered reports from throughout the Del-

aware Bay area indicated that there were increased commercial catches of adult shad, and a significant number of young shad, 10 to 12 inches in length were observed.

Great Swamp was almost New York City's fourth jetport until some 6,000 citizens and 462 organizations banded together in 1960 to purchase it and donate it to the national wildlife refuge system. Now its more than 6,000 acres of wooded swamps, freshwater marshes, bogs and uplands produce some 4,000 young wood ducks each year and provide habitat for more than 200 species of birds, mammals such as deer, muskrats, fox, mink, otter, and beaver and a wide variety of interesting botanical species.

Brigantine on New Jersey's southern coast is among the most famous of all the nation's refuges and draws visits from naturalists from all over the world. Something of natural interest is going on there all year round. In early summer Canada goose pairs herd their young around the dikes in great numbers. By late summer the shore-bird migration has begun, followed by blue and

green-winged teals and pintails in September, black and shoveler ducks and brants in October, and climaxed by great flocks of snow geese in November. Winter is a good time for viewing predator species, including occasional bald eagles and peregrines, and in spring the shore and wading birds reappear to begin the natural year again.

Guide to the National Wildlife Refuges, published by Doubleday, is the first comprehensive guide to the 380 national wildlife refuges located in 49 of the 50 states in almost every kind of ecosystem. It tells how to get to the refuges, what to see and do there, and provides detailed information on motels and campgrounds, when are the best (and worst) times to visit and what to take along. It contains over 600 pages of text and almost 200 maps along with folios of color photographs of interesting birds and other animals to be seen in the refuges. □

The Lewis Fishery, the only non-tidal commercial shad facility on the Delaware River, captured a total of 2028 shad at Lambertville, N.J. This was almost twice the number of shad captured in 1978. The composition of males to females was 65% and 35%, respectively.

Generally, reports from all sections of the Delaware River indicated that anglers had experienced an excellent year for shad fishing.

Shad Tagging Program

A total of 1155 adult shad were tagged at Lambertville during the six week tagging effort. As of 5/22/79, 83 tags have been received from cooperative anglers.

Sam Osmun of Easton, Pa. caught three tagged shad on different occasions while fishing the Delaware River in the vicinity of Easton.

Shad anglers are reminded that their cooperation is vital in monitoring and evaluating the annual shad migration. Anglers returning tags will receive a small monetary reward, a Service

Award Certificate and biological information on the Delaware River shad project.

Raritan River Shad Restoration

The Raritan River Shad Restoration Project moved ahead this spring with extensive field work on the Delaware River. Four possible collect sites have been found where seining and transfer of the shad to a transport truck can be done with a minimum of stress on the fish. Locating such sites has not been easy because of the project's exacting site specifications: (1) a shallow landing area for the seine (2) a shore free of brush with a working area for a crew (3) a bottom free of obstructions (4) close access for the transport tank (5) a current slow enough for the handling of a 600 ft. seine and (6) a sloping bottom not over 10 ft. deep. Project personnel, while locating possible sites, have also become proficient at handling the large seine necessary to catch shad in the Delaware. This summer, time will be spent cleaning out the bottom obstructions at final sites.

The special circular shad transfer tank, needed to transfer the fragile shad between the two rivers, is already under construction in New England. It's expected to be finished this fall. □



Environmental News

U.S. and N.J. Join Forces to Crackdown on Illegal Dumpers of Toxic Wastes

The illegal disposal of toxic and hazardous wastes is a nationwide problem that is of special concern in New Jersey. DEP Assistant Commissioner for Science, Dr. Glenn Paulson, has pointed out that the problem is particularly acute in New Jersey because of its population, the highly industrialized nature of its economy and its geographic location in a coastal plain with abundant waterways and wetlands. In some cases, the chemicals that are dumped illegally are either known or suspected cancer-causing substances or are so highly inflammable as to make them an immediate danger to life and property.

"The collection, transportation and disposal of toxic wastes are integral parts of an illicit industry which makes millions of dollars a year," said state Attorney General John J. Degnan. For example, a chemical firm may have to pay between \$50 and \$100 to dispose of a drum of chemical waste (70 percent of the wastes are now hauled to out-of-state disposal facilities as New Jersey, at present, has only 20 such licensed facilities). The cost of disposing of the contents of an 8,000-gallon tank truck runs into the thousands of dollars. Yet, such a truck can be illegally emptied into a city sewer system in just eight minutes. Rogue disposal companies also mix toxic wastes with garbage and bury them in landfills where the toxics eventually leach into the watertable and enter the waterways of the state; they abandon drums of chemical waste at random sites or just abandon the truck (usually rented) loaded with the drums along the roadside, usually under cover of darkness (hence the term, "midnight dumpers").

State/federal legal actions

Only in recent years have the problems created by illegal dumping of hazardous wastes become generally known and thus law enforcement efforts in this area are relatively new. But, prosecution of such violators of state environmental laws has begun. For the past two years, the state Attorney General's office in cooperation with DEP has been investigating such cases and as of the end of June 1979, six indictments have been obtained against 12 individuals and six corporate defendants. Convictions or guilty pleas were obtained from all defendants in the cases disposed of, and several acting investigations are pending.

On the federal level, the U.S. Attorney's Office in New Jersey, under the direction of Robert Del Tufo, has instituted nine civil and two criminal actions in the nine-month period between October 1978 and June 1979 for violations of federal environmental laws. Actions were brought against dischargers of toxic chemicals, oil and other pollutants into the state's waterways, including the Salem Canal, the Delaware and Raritan Canal, the Arthur Kill, Newark Bay and adjoining waters in the industrial area of Newark. Fines and penalties assessed against individuals and corporate defendants ranged from \$500 to \$50,000.

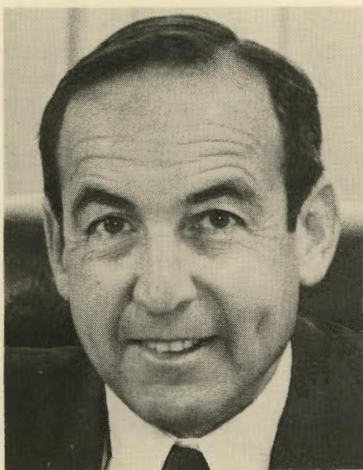
Despite ongoing investigative efforts, there are indications that illegal disposal may be increasing in New Jersey, and that more law enforcement capabilities—investigative, legal and legislative—are needed to curb its growth. Two steps to this end were taken this summer.

Strike force

New Jersey is forming the nation's first toxic and hazardous waste strike force specifically designed to detect and investigate illegal dumping of the dangerous substances, prosecute those involved, assess criminal or civil penalties and generally crackdown on so-called "midnight dumpers." The new inter-agency unit, which will coordinate continuing state and federal efforts, and chemical company and government efforts to deal with the problem, will be

DEP TOP MANAGEMENT CHANGES

- O'Hern resigns
- English named Commissioner
- Graham appointed Assistant Commissioner for Natural Resources



DANIEL J. O'HERN resigned from the position of Commissioner of Environmental Protection on July 13 to accept the post of chief counsel to the governor, effective July 16. During his 14 months as DEP's top executive, O'Hern endorsed the state's efforts to control de-

Continued on page 16B



JERRY FITZGERALD ENGLISH of Summit is the new Commissioner of Environmental Protection. Nominated for the position by Governor Byrne on August 3 and confirmed by the state Senate on August 6, Mrs. English was sworn in as commissioner on August 23.

Continued on page 16A

DEP TOP MANAGEMENT CHANGES

velopment in the Pine Barrens, opposed the construction of a dam on the Delaware River at Tocks Island and supported the creation of a federal oil spill compensation fund. O'Hern, who is an attorney, had been Mayor of Red Bank before his appointment as DEP Commissioner in May 1978.

English, an attorney, served as Legislative Counsel to the Governor for the five years immediately preceding her appointment as DEP commissioner. Earlier (1970-1974) she had been a partner in the Summit law firm of Moser, Griffin, Kerby and Cooper, which she entered as a law clerk in 1964, rising to Associate in 1965 and full partnership in 1970. She was elected to complete an unexpired term in the state Senate from 1971-1972. English was Assistant Counsel to the New Jersey Senate from 1971-1974. She has been active in community affairs including being the founder and president of the Friends of Watchung (a conservation organization which successfully stopped I-95 from going through Watchung Reservation). English received a B.A. degree in International Relations from Stanford University and a Juris Doctor degree from Boston Law School. She is listed in Who's Who of American Women. English is married and the mother of four children. □



DONALD T. GRAHAM, 41, of Brick Township was appointed Assistant Commissioner for Natural Resources on July 13. He will be responsible for overseeing the activities of the department's divisions of Coastal Resources, Parks and Forestry, Fish, Game and Shellfisheries, and the Green Acres Administration. Graham has been director of DEP's Division of Coastal Resources (formerly the Division of Marine Services) since 1974. In addition to his new duties as assistant commissioner, Graham will continue as division director of Coastal Resources until a replacement is named. Graham, a career employee with the department, entered state service in 1962.

DEP BUYS WETLANDS FOR PUBLIC USE

The department recently purchased 525 acres of salt marsh and wooded uplands in Little Egg Harbor Township (Ocean County) from the Nature Conservancy, a national land conservation organization. The land, located in the Great Bay and Barnegat Bay areas, provides excellent habitat for waterfowl and shore birds; and the marsh supports many species of fish, game and shellfish. The high quality wetland will be managed by DEP's Division of Fish, Game and Shellfisheries as part of the Great Bay Wildlife Management Area. Plans call for the land to be open to the public for fishing, crabbing, nature observation and hiking. The acquisition was made with \$96,250 in Green Acres funds. A federal grant application has been filed with the U.S. Fish and Wildlife Service for a 75 percent reimbursement. □

With Dep Approval

NEW JERSEY FIRMS ACT TO CUT DOWN DEPENDENCE ON OIL

Atlantic Electric Company will convert two of its three Deepwater station generating units in Salem County from oil to coal in a manner that will not harm air quality. The utility will use low sulfur coal and is installing the latest "state-of-the-art" pollution control equipment to ensure that state standards on emission of particulates and sulfur dioxides are met. The change to coal will be more economical for the company, according to a recent privately-financed study.

The two generating units supply power to the adjacent DuPont chemical manufacturing plant which pays a large part of the cost of the units' operation. DEP Acting Commissioner Betty Wilson, in the mid-July announcement of the project, said, "Both Atlantic Electric and DuPont should be commended for this project which will be a significant step toward conserving fuel oil by using coal, a far more plentiful resource."

George Tyler, director of DEP's Division of Environmental Quality, said the conversion from oil will produce two of the best coal burning plants in the nation from an air quality viewpoint. "DEP encourages the switch to coal under environmentally acceptable conditions," he said. □

Progress report

DEP PUBLIC PARTICIPATION PROGRAM

The department's Public Participation Policy, refined by comments and suggestions received at five public hearings around the state in late 1978, was adopted on April 9. It gives the purpose, designates the responsibility and spells out standards to measure an effective public participation plan.

The new policy will not affect the regular system of public hearings which are legally required for many DEP actions, nor will it reduce the responsibility of the Commissioner of Environmental Protection to make final decisions on any departmental action.

An Office of Public Participation was formed within the department to oversee and coordinate public participation activities of the various units of DEP, especially during preparation of new or amended rules, regulations or programs. When needed, public meetings will be called by the department to solicit public suggestions on proposed DEP

MARINE SERVICES REORGANIZED

A July 1 reorganization of the department's Division of Marine Services to manage the state's coastal resources more effectively included the consolidation of all project review functions into one office in an effort to expedite the permit process. The reshaping of the division along functional lines is being accomplished largely through the reassignment of existing personnel.

The unit's name was changed to the Division of Coastal Resources to better reflect the scope of its responsibilities.

Under the new organization, the Bureau of Tidelands will be responsible for sales of state-owned tidelands; the Bureau of Coastal Planning and Development—planning functions; the Bureau of Coastal Project Review—permit application review; the Bureau of Coastal Enforcement and Field Services—field inspections; the Bureau of Coastal Engineering—engineering services; and, the Bureau of Marine Law Enforcement will police the coastal waters. □

Continued on page 16D

TO REPORT ABUSES OF THE ENVIRONMENT CALL ACTION LINE 609-292-7172

Pinelands Update



GOVERNOR SIGNS PINELANDS BILL. The bill known as the Pinelands Protection Act was signed into law by Governor Byrne in a State House ceremony on June 28. The new law, Chapter 111, P.L. 1979, provides legislative authority for a state program to protect the unique wilderness area and the vast underground water supply beneath it. Byrne said that "100 years from today" this bill might well be considered the most significant he has signed.

Witnessing the signing are (seated, left) State Assembly Speaker Christopher Jackson, Senate President Joseph Merlino (one of the bill's sponsors), and Mrs. Jean Byrne. Standing, from left are Assemblywoman Barbara Kallek, state Secretary of Agriculture Philip Alampi, Assemblyman Thomas Deverin, Senator Charles Yates (co-sponsor of the bill), Assemblyman Gerald Stockman, Senator Frank J. Dodd, then Environmental Protection Commissioner Daniel J. O'Hern, and Community Affairs Commissioner Joseph LaFante.

Exemptions: Between March 2 and the enactment of the Pinelands Protection Act on June 28, the Interim Pinelands Review Board rendered decisions on more than 350 applications for exemptions to the temporary restriction on development and building permits in the Pinelands. A total of 271 applications had been approved (including 2,445 dwellings) and 81 had been denied (including 12,095 dwellings—the bulk of these in proposed multi-unit complexes).

Appeals Court action: A decision handed down by the Appellate Division of the state Superior Court on June 12 upheld the strict water quality standards, including the "critical area" designation, imposed on a 760-mile area in the central Pine Barrens in January 1978. In an unanimous decision, the court rejected the contention of the New Jersey Builders Association, the Town of Hammononton and farm groups that the regulations were "unreasonable, arbitrary and capricious." The three-judge panel (Judges John F. Lynch, John F. Crane and Herbert Horn) also ruled that the Commissioner of Environmental Protection acted within his authority when he adopted the anti-pollution regulations.

Supreme Court action: The New Jersey Supreme Court on July 5 dismissed the New Jersey Builders Association challenge to the constitutionality of Governor Byrne's authority in imposing the temporary restriction on building permits in the Pinelands in Executive Order #71, issued February 8, 1979. The court, in an unanimous decision, said the executive order lapsed on its own terms with the signing of the Pinelands Protection Act on June 28.

Pinelands Commission: The Pinelands Planning Commission created under Executive Order #71 was renamed the Pinelands Commission under the new Pinelands law. The membership of the 15-person board remains the same. (See these pages, NJO May/June 1979.)

Terrance D. Moore, 37, of Lake Hopatcong was appointed Executive Director of the Pinelands Commission by Governor Byrne on June 28. Moore, at the time of his appointment was Executive Director of the Newark Watershed Conservation and Development Agency.

Pinelands acquisitions: Many of the tracts being considered for purchase by the state have been previously identified by planning studies as critical to the preservation of the Pinelands' ecosystem. These include additions and interior exceptions to Wharton, Green-

Continued on page 16D

CLEAN AIR PLAN APPROVED

New Jersey's State Implementation Plan (SIP) for achieving federal air quality standards received conditional approval from the U.S. Environmental Protection Agency (EPA) on July 5. The plan, which was the subject of several public hearings before DEP submitted it to EPA by the January 1, 1979 deadline, is expected to receive final approval in the fall.

The U.S. Clean Air Act amendments of 1977 require each state to submit a plan to meet nationwide air quality standards by 1982. The standards have been set for air pollutants including sulfur and nitrogen dioxides, particulates (soot), ozone (smog) and carbon monoxide. Provisions for dealing with the last two auto-related pollutants are eligible for extensions to 1987, under the law.

Though New Jersey is satisfactorily meeting health-related primary air quality standards for sulfur dioxide and particulates, some parts of the state are not yet meeting the standards for the auto-related pollutants (carbon monoxide, hydrocarbons/ozone). DEP has requested an extension to 1987 to achieve compliance with the federal standards □

GRAY NAMED TO TOXICS POST



Dr. Sidney Gray was named acting director of DEP's Program on Environmental Cancer and Toxic Substances in June. Dr. Gray had been manager of the Risk and Health Assessment Unit in the toxics program. Gray, a resident of Princeton, originally was trained as a meteorologist and a physicist. Before joining DEP two years ago, his research and management experience included the social sciences as well as physical science and engineering. He had been employed for much of his career by the RCA Corporation. Gray received his bachelor's degree from New York University and his doctorate from Rutgers University. □



Continued from page 16A

Crackdown on Illegal Dumpers

financed by a \$500,000 grant from EPA and \$100,000 in state funds (\$600,000 in all).

The announcement of the grant award and creation of the strike force was made by Governor Byrne and EPA Region II Administrator Eckhardt (Chris) Beck at a press conference in Trenton on June 27 attended by representatives of the state and federal agencies involved. These included DEP, the Attorney General's Office, EPA and the U.S. Attorney's Office.

Governor Byrne, noting that New Jersey generates about 1.2 billion gallons of toxic waste each year, said, "I am under no illusions that this grant will put an end to the problem of toxic and hazardous wastes in New Jersey—but it will enable us to provide a truly coordinated and formal approach to enforcement and administrative aspects of the problem that has been lacking in the past."

EPA Administrator Beck said, "EPA has consistently found New Jersey to be highly sensitive to this issue and willing to make hard choices to deal with it, and it is therefore pleased to award the state the first EPA grant for this type of program... We are optimistic for its outcome, and expect it to become a valuable model for the rest of the country."

The grant will enable the state to hire attorneys to work in the divisions of Criminal Justice and Law and in the U.S. Attorney's Office to concentrate full-time

on the problem. The grant will also pay the salaries of two State Police sergeants, seven civilian investigators, two chemists and support personnel.

Four-part program

A comprehensive four-part program aimed at effectively coping with the rising tide of problems associated with the disposal of hazardous wastes was outlined by Governor Byrne on July 19.

- Use the Strike Force to intensify efforts by various agencies to detect and prosecute illegal handling and disposal of hazardous wastes.

- Impose new criminal sanctions for violators, including stiff fines and jail sentences for those convicted of illegal disposal.

- Amend the New Jersey Spill Fund legislation to provide funds for the cleanup of abandoned dump sites or illegal or mismanaged disposal areas.

- Appointment of a special advisory committee to tackle the question of whether it is feasible for the state to sponsor the construction of a major regional hazardous waste facility. The 13-member committee, made up of representatives from government, industry, and environmental interests, will be chaired by Rocco D. Ricci, chief engineer of the Passaic Valley Sewerage Commission, and a former DEP Commissioner. The committee will make recommendations to the Commissioner of Environmental Protection. □

Continued from page 16B

PUBLIC PARTICIPATION PROGRAM actions.

Chief of the Office of Public Participation is Ian R. Walker of Cranbury. Walker, who joined DEP in 1975, served as chief of the Office of Environmental Assessment in the Division of Water Resources prior to assuming his new post.

An 18-member volunteer committee which will advise the Office of Public Participation and make recommendations to the commissioner held its organizational meeting in Trenton on July 31. Half of the membership came from DEP and half from various public sectors. □

Continued from page 16C

Pinelands Update

wood, Lebanon and Bass River state forests and Swan Bay Fish and Game Reserve; West Plains Pygmy Forest; Oswego River Extension; Friendship Bogs; Bulltown; Batsto River Headwaters; and Cedar Creek Wild and Scenic River Area. □

DEP 1978 ANNUAL REPORT AVAILABLE

The Annual Report of the New Jersey Department of Environmental Protection for fiscal year 1978 has been published. To obtain a copy, please write to DEP Documents Distribution Center, Box 1390, Trenton 08625. □

SAVE OLD HUNTING LICENSES

With the fall hunting season approaching, DEP's Division of Fish, Game and Shellfisheries reminds New Jersey hunters to save their old firearm or bow hunting license to avoid being required to take, or repeat, a hunter education course. State law mandates that both adults and juveniles applying for firearms or bow and arrow hunting licenses must present their previous license (any state, any year) or a properly signed certificate showing that the application has satisfactorily completed the appropriate hunter education course. □

USE 1979 LEAVES ON 1980 GARDENS

Instead of bagging fallen leaves for the trash collector, consider recycling them through a compost pile. Leaves make a very good compost base. Add grass clippings, vines, dead flowers, vegetable waste, kitchen scraps and weeds. These materials become rich organic matter after a winter in compost. The result is an excellent soil conditioner.

To make a compost pile, mark out an area 3 to 5 feet square. Heap organic matter in layers about 6 to 12 inches thick, layering with commercial fertilizer if you wish, and one half layer of soil. To eliminate odor, keep the compost heap damp and maintain a top layer of soil. In the spring, work the compost material into the garden soil and into soil around trees and shrubs. □

ANTI-LITTER CAMPAIGN BEGINS

"Help the Garden State Live Up to Its Name—Don't Litter" is the theme of a special statewide campaign to renew our pride in New Jersey by keeping it litter free and clean. New Jerseyans from all walks of life, from large cities, small towns and rural areas are involved in grass roots projects like cleaning up graffiti and cleaning street signs to spruce up their communities. □

Nature's Paintbrush Colors



FALL FOLIAGE TOUR BROCHURE

DEP's popular "Nature's Paintbrush" foldout brochure, containing maps and text for six suggested leaf-turning tours—including information for drivers, bikers and hikers—will again be available from DEP, Division of Parks and Forestry, Box 1420, Trenton 08625; from any state park or forest office; or at toll booths on the N.J. Turnpike and the Garden State Parkway. □



Pine Barrens Moonshine

BY TOM REED

In order to exploit an unfilled niche, many animals have evolved to become nocturnal. I invite all who share my interest in ecology, spirit of adventure, and appreciation of solitude to try night hiking—exploit an unfilled niche in outdoor recreation.

Because of the limitations of the human eye, there is no better night on which to hike than that of the full moon (actually, the two days before and after the full moon, if clear, are also “moony” enough for good visibility). And because of the mysterious atmosphere created there by moonbeams, there is no better place to night hike than the Pine Barrens. I have awarded this status to the Pine Barrens not only because of its mystery but also of its geology. The soil of the area, actually ancient marine sand, is white. Consequently the sand reflects moonbeams and causes a trail to glow in the night. John James Audubon noted this as he traveled through the Pine Barrens one night in 1829.

He wrote, “the night was dark and gloomy but the sand of the road indicated our course very distinctly”. Under such conditions hiking at a three-mile-per-hour pace is easy, especially since a hiker need not worry about stumbling on a rock—there are none in the Pines.

My first experience with Pine Barrens Moonshine occurred a few years back, during the final days of October. There are many jeep trails lacing the expanse of the Pinelands, but since I prefer to hike a more narrow footpath, I chose to travel the Batona Trail. Those unfamiliar with this trail may

apply to the Batsto Village center for information, trail maps, and camping permits. Early on that October evening my companion, Scott “Bru” Brubaker and I stood at the Batsto trailhead awaiting the rise of our natural satellite. Although the air of the forest seemed damp, the air above was obviously dry: the atmosphere was totally invisible, with a clarity that revealed the depth of outer space. Since clear autumn nights are cool nights, we stood waiting bundled in all available clothes. We wondered just how bright the woods would be—how hard would it be to find our way.

After the full moon cleared most of the treetops, we shed down to hiking apparel (a wool shirt and sweater), hitched on our backpacks, and made way. We were amazed at the degree of illumination, especially with the moon still so low! We laughed at ourselves for carrying flashlights in our pockets; they were bulky and never needed on the trail.

In the eerie moonlight some functions of the eye diminish, to be replaced by imagination. We found that even though a distant object might be visible, we often would be unable to identify it. Illusions appear, but it is not your eyes that deceive you, it is your mind. Inanimate objects become creatures of the woods. In compensation for the limited vision, other senses become more acute. Temperature differences between the cold air which drains into the dips in the trail and the warmer air on the rises are felt as drastic. All sounds are amplified: footsteps are thunder, breath is wind,

and voices—well, we tended to hold all our conversations at well below normal volume. Bru says it is simply more quiet at night, but I think that because of the inability to concentrate on the vagueness of what is seen, you concentrate increasingly on what is heard, and therefore ordinary quiet is intense silence.

After a few minutes our footsteps and breathing returned to their normal less audible level, as our ears began to focus on sounds around us. Some of these were common: the rustling of leaves in the woods, or an approaching gust of wind roaring through distant trees. Some were unique and caught our full attention: honks and bugles cascading out of the northern sky. Eventually these noises came from directly overhead but our eyes could not detect the obvious source—migrating Canada geese. Further along the trail we were startled by loud snorts, obviously produced by a large beast only a few yards into the scrub oak. We stopped, straining our eyes to see. It snorted again then bounded away waving a white flag—a deer, perhaps a young buck in the rut. Later a Great Horned Owl solemnly inquired “Who are you? Who? Who?” thus the final, almost mandatory ingredient was added to complete our classic nocturnal wildlife experience.

I realized that I would not have known of their presence had these animals not sounded. Then I began to wonder what other beings were present yet unaccounted for because they were quiet. What about all those nocturnal rodents? Looking up at the moon gives you a sense of place—the moon is there, I am here, on Earth, in the sprawling Pine Barrens, deep in the heart of the Pine Barrens. What else is out there? What about the legendary witches of the Pines, the Jersey Devil, the Werewolf of the Batona. . . .

“Hey, don’t look at the moon so long—you’ll get moonblind.” “Yeah, I know what ya mean. Good thing we’re wearing wide-brimmed hats—woulda got moonburn.” It was late now, after midnight I suppose, and the moon was high and very bright. After a few miles more we reached the Batona Camp. The night hike was over. We bivouacked without using a flashlight, stretched out in our bags, and turned away from the brightness of the moon to get to sleep. □

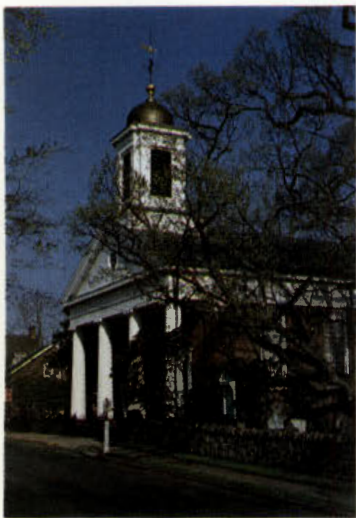
The Historical Legacy of Three Village Churches

BY CARLETON V. BRAIRTON

“It cannot be a town in law, unless it hath, or in past time hath had, a church and celebration of divine services, sacraments and burials.”

This old English statute defined the beginnings of New Jersey's earliest towns. And three lovely villages in Central Jersey—Basking Ridge, Oldwick, Mendham—grew up around their churches.

Fortunately the congregations and residents of these towns take pride in preserving the rich heritage of their churches. Not only are these structures architecturally beautiful, but the inscriptions on the cemetery tombstones reveal something of the hardships and endurance of our early settlers. A day in the country enjoying one or all three of these village churches (each is within easy driving distance of the other) can be a memorable New Jersey outing.



Basking Ridge The Presbyterian Church

The picturesque Presbyterian Church of Basking Ridge is uniquely situated at the foot of the main street. There is a stone slab over one of the doors



which tells the history of the church. “This church was rebuilt A.D. 1839, on the site of the former one reared A.D. 1749 where stood the Ancient Log Church near the beginning of the last century.” The present building with its stately white columns is a classic example of Greek Revival architecture, which was popular during the 1800's. However the original log structure dated back to around 1717, making this one of the oldest churches in New Jersey.

Standing next to the church in the graveyard is an awesome looking white oak. This tree is over 500 years old, and has a history all its own. There is a marker beneath it which was placed there in 1966. At that time the height was 80', the circumference 18', and the limb spread 138'. Today with care provided by church funds, it continues to grow. Since the turn of this century, the congregation and “Friends of the Old Oak” have helped preserve their landmark. In the early 1900's, experts from Trenton cleared its hollows and fill them with cement. Again in 1928, specialists filled 72 cavities in the base and trunk—including one in which three men could stand—with 3 tons of cement. They also strung cable to suspend the massive limbs which spread gracefully from its trunk. With a little help from modern man, this venerable tree has endured since before Columbus discovered America. And when it was already 300 years old, Washington, Lafayette and the Colonial troops rested beneath it's limbs.

Surrounding the church and tree is the Old Graveyard which contains gravestones from the original settlers of the town. Although some of the epitaphs have crumbled with age, many are clearly decipherable. The oldest recognizable stone belongs to Henry Haines who died in 1739. There are also the headstones of John McCullum and his wife Mary, who both died in 1760. Remarkably he lived to be 103 years old and his wife 84. His epitaph reads “Here lies ye body of John McCullum who departed this life April ye 18th A.D. 1760 in the 103rd year of his age.” This followed by a long inscription containing the warning: “Take may advice; . . . Make Ready All To Dye.” The graves of Revolutionary War soldiers number around 35, and there are also some veterans from the Civil War. The most famous gravesite, which is located near the fence which faces Finley Avenue, belongs to Mary Lewis Kinnen. Although born in Basking Ridge in 1763, she moved to Virginia when she married at age 15. In 1791 Shawnee Indians attacked her cabin, killing her husband and daughter; however, her brother, who was visiting from Basking Ridge, escaped with her two sons. Although severely wounded, Mary was forced to march to Ohio where she was later sold as a slave to a Delaware tribe. Through a trader, she slipped a letter to her brother who had returned to Basking Ridge. A year and a half later the note reached him,

and he rescued her in a daring escape. Nearly three and a half years after her capture, she returned to her sons in Baking Ridge, where she lived to be 85.



Oldwick The Zion Lutheran Church

Oldwick is a quaint village located in Hunterdon County just off Route 78. When it was first settled in the 1740's by German Lutherans, it was called New Germantown. After they built their church in 1750, the community grew.

This church is unique because the original structure has never been destroyed, only modified. Instead of a frame building, these German settlers built this church with thick stone walls just as it would have been in Germany. In sharp contrast to the elegant 19th century Greek Revival architecture, this church reflects the rural frugality of its founders. Today it is beautifully preserved with its white stucco exterior, green shutters and etched Gothic windows.

Not only has the community preserved the building, but also the church's fascinating history. Among the historical documents which relate to the church's history are the original Royal Charter issued by George III in 1761, and a vestry book and register begun in 1767 by one of its ministers.

What is most interesting about Oldwick's Lutheran Church is its cemetery. Reading the inscriptions, one can't help but wonder about the lives of these early Americans. There are a number of women who died in their 20's, perhaps in childbirth or with fever. A simple tribute to Mary Dorothy Vlier who died in 1803, age 24 tells something of her life: "A tender wife/ And mother dear/ A faithful friend/ Is buried here." Another woman who died in 1816, Rhoda Williams, lived to be 53, but her inscription tells of her sorrow. "Afflictions sore long time I bore/ Physicians prov'd in vain./ Till God did please to give me ease./ And freed me from my pain."

The oldest recognizable stone belongs to Anna Gertrude Pickel (1761), the wife of Baltus Pickel. Baltus Pickel, a wealthy farmer who owned 1,000

acres, was the most influential man of New Germantown in the 1700's. Throughout his life he contributed generously to the church, and left it almost \$5,000 when he died at the age of 79 in 1765. Although the present chancel was built over his grave, the headstone was moved behind the church under the pines. Interestingly, he had a son who died the same day, but there are no records of how they died—perhaps an accident or illness. We will never know. Throughout the cemetery names like Kline, Eick, Melick, Rinehard, Neff, Graff and Swakhamer reflect the German heritage of Oldwick. And to this day there are still descendent of these early settlers living in the area.

PHOTOS BY JOE SEIDEL



Mendham First Presbyterian Church

In the 1800's, one of the ministers of Mendham's Presbyterian Church, Reverend Thomas Hastings said, "I know of no church in any village which has so beautiful and picturesque a location." Today visitors to the Hilltop Church, as it is called, can still appreciate its beautiful setting. Seeming to reach to the heavens, the steeple of this colonial designed structure can be seen for miles among the hills surrounding Mendham. And viewing the New Jersey landscape from the church is well worth the trip.

Although the present structure, which is located on Hilltop Road just off Route 24, was dedicated in 1860, the first church, a wooden building with cedar shingles, was erected in 1745. The history of the church is wrought with calamity. In the winter of 1777-78, the pews were removed so that the church could be used as a smallpox hospital for Washington's troops. Twenty-seven soldiers who were hospitalized there died of this disease and are buried in the graveyard. There is a single stone marking their graves. On May 16, 1813, lightning struck during the services, killing Mrs. John Drake and seriously injuring several other parishioners. Although the church had a lightning rod, this had broken off eight feet from the ground, and the lightning entered a window.

When the old church was not large enough for the growing congregation, it was torn down and a new one built in 1817. However this was destroyed by fire in 1835. A new building was erected and later enlarged, but this too was the victim of fire in 1859. The cause was a faulty chimney. When the sexton started a fire to warm the church for services, the roof caught, and the flames completely engulfed the church.

Finally when the present building was completed in 1860, a 1500 pound bell was installed in the belfry. Soon after, its clapper weighing 70 pounds fell 80 feet and crashed through two floors. No one, however, was hurt. Although the inside of the church has been modernized since 1860, the exterior remains intact.

Located directly behind the church is the "Old Yard" which displays the unusually large headstones of Mendham's earliest families. This cemetery dates back to the 1740's and originated as a common gravesite for victims of a terrible epidemic known as "the long fever." Probably a virulent form of typhoid, this disease wiped out more than half of Mendham's population. The records of one family show its devastation. Between March 1749 and July 1749, Joseph and Lydia Thompson, five of their children and three grandchildren all died of this fever. Since many people had to be buried quickly, there were few marked gravesites.

During the 1800's and early 1900's, this cemetery became overgrown with weeds and bushes, and many headstones were cast aside and lost under piles of

broken stone. In 1920 the church's Board of Trustees established a fund to restore the Old Yard and keep it perpetually in good condition.

There is an amusing story about one of these headstones which had been lost in the 1800's and discovered during the restoration. It belongs to Daniel Beers who "made his exit" in 1790. The stone, which is next to the walkway, gives his age as 237 years, 3 months and 24 days. Actually he was 23 when he died. But the stone carver left a large space between the 3 and the y. In the 1840's an unidentified boy from the local boarding school expertly carved the 7 into the stone. At the time, this act of vandalism caused quite an uproar in the community. Today the headstone causes only astonishment.

Among the many family groups buried here are the Byrams. The oldest stone in the cemetery belongs to Nephew Byram who died in 1747. Here too is Ebenezer Byram, who established the Black Horse Tavern, which still exists in Mendham. One story also attributes the naming of the town to him. When he discovered that there were a number of unruly characters living in the area, he said, "I'll mend 'em." He then contributed money to build the first Hilltop Church.

Visiting these three village churches offers New Jerseyans a sense of pride in their historical heritage and identity. For more than 200 years, generations have worked to preserve the meaning and beauty of these early churches. We can be proud of their legacy.

Continued from page 15

The Pine Barrens

signs. We are living dead-centered along the "Bos-Wash Corridor," grinding out our garbage in machine mouths, drinking chemical-company water. This is no bell-jar, wilderness existence.

Zen, product of centuries of development on tiny islands, understands this perfectly. So Zen would not preach, if it could preach, or did preach, that such realities of life are evil. Unnecessary. Or even to be avoided. All Zen might suggest is that a vast garden-for-comtemplation lies nearby, at the very fringes of our lawns—and our lives—here in the West.

In the inscrutable East, such gardens are carefully devised to prod the right side—the intuitive, non-verbal, spontaneous, suggestive side—into letting go. Designers use tricks of form and space to accomplish this, carefully placing dwarf trees, dark water, white sand, mossy stones. The results? Asymmetric, hauntingly beautiful gardens whose vistas resemble, in repeated and striking ways, those to be seen throughout the Pine Barrens.

These not-so-inscrutable Western gardens had no designers. They laid themselves out, accidentally, spontaneously, unselfconsciously, through several

millenia—a fact that makes them no less capable of prodding us into a Zen-honed awareness.

It's not difficult. Observe these views. In the turn of the cedar bog, the fringes of pine rooted in scoured sand, the riot of detail in moss underfoot, the calm progression of stone, bush, tree, sky; in this we can reflect on the way our world, all worlds, lead. From the particular, the familiar, the near, out, around, and away, into the larger, the less near, the whole we label "life."

To understand that is to understand why I value the natural, built-in Zen garden quality of the Pine Barrens so highly. You may also appreciate why I can't help but feel frustrated as I watch the acreage around me compressed, paved over. Because there's more here than mere sanctuary for endangered frogs and flowers. We, the people, need this wild place, too, for its sky above, its water below, its spare forces of beauty—for its Zen essence.

A modest proposal: that we encounter the Pine Barrens as a surefire place to see ourselves. Not in the eyes of others, but with our own inner vision. That wouldn't cost a thing. Just don't be surprised if such encounters move you to make a few demands on yourself—to see, to know, to care. That's what happened to me. □



Wild Turkey Stamp Contest Winner

Noted wildlife artist Ken Carlson's painting of two Merriam's wild turkeys bested a field of 127 entries to win the 1979 Wild Turkey Stamp competition recently held at the National Wild Turkey Federation's annual contest in Augusta, Georgia.

Carlson's entry, entitled "Morning Roost," has been reproduced on the Federation's fourth Wild Turkey Stamp, purchased voluntarily by conservationists, philatelists, and private collectors. Revenues from the stamp are used for education, restoration and research.

In addition to the limited stamp issue (only 50,000 printed), a signed and numbered edition of prints (6-1/2" x 9") has been produced and is available through most reputable wildlife art dealers.

Priorities established for this year's funds include research grants totaling \$5,000.00 to be presented to Auburn University and Texas A & M University, production of 2000 trap-transfer boxes, and for the first construction phase of the nation's only Wild Turkey Research Center.

The 1979 Wild Turkey Stamp is available at \$3.00 per stamp, \$30.00 per sheet, while they last. A free stamp brochure is available by writing the National Wild Turkey Federation, Edgefield, South Carolina 29824.



1979 Young Waterfowlers Program

This is the fourth year the NEW JERSEY WATERFOWLERS ASSOCIATION has sponsored a class and a hunting day for the young hunters of New Jersey.

November 4, 1979

Highlands Yacht Club, Highlands, N.J. 8:30 AM Classes on Decoy Carving, Duck Hunting Methods, Duck Hunting Equipment and Boats, Waterfowl Identification, Hunter Ethics and Wetlands Conservation. Films will be shown and lunch served.

November 11, 1979

Wayside Skeet Club, Wayside, N.J. 10:00 AM The Program students will be given a chance to fire their shotguns at clay birds, and get some practice in for the hunting season.

SECOND HALF OF THE WATERFOWL SEASON

Each student will be assigned a seasoned Waterfowler as his personal instructor and taken hunting at the BRIGANTINE NATIONAL WILDLIFE REFUGE. A closed area of the Refuge has been set aside by Mr. Gaylord Inman, Federal Wildlife Service, Refuge Manager for the participants of the Young Waterfowlers Program. This is the best area in New Jersey for observing and taking waterfowl.

The Young Waterfowlers Program is open to residents of New Jersey, between 14 and 17 years old, who have a New Jersey Hunting Licence.

Complete the attached application and mail it to:

Bob Creeden,
Chairman—Young Waterfowlers
46 Asbury Avenue
Atlantic Highlands, New Jersey 07716

APPLICATION—1979

NAME _____

AGE _____

ADDRESS _____

HUNTING LIC. NO. _____

DATE _____

TELEPHONE NUMBER _____

SANDY HOOK By Jeanne Quinn

Over 11,000 years ago a sand spit was formed off the coast of what one day would be New Jersey. The northernmost tip of this sand spit formed a hook-like barrier whose contour, even today, is constantly changing, as the longshore currents carry the sands ever northward. The hook was formed by wind and sea while the area, which is now Sea Bright, eventually connected with it forming a barrier beach and protective alliance against the sea.

Sandy Hook is a self-contained world of wonder with a holly forest, salt marshes and fresh water ponds. Although the hook is surrounded by salt water, fresh water ponds abound where once there were salt lagoons. Because of the fresh water table five feet underground, plants are able to grow in abundance. Among the vegetation can be found beach plums, cattails, black-eyed Susans, Queen Anne's lace, prickly pear cactus, bayberry and blueberries. Dune vegetation such as sumac and beach plum help to stabilize the shoreline, while the holly forest provides a unique habitat for plants and animals.

No tree can be found growing along the shoreline over fifteen feet tall. The salt spray which blows constantly tends to stunt their growth.

The Hook lying along the Atlantic flyway is a major bird migration spot along the eastern shoreline. Over 300 species of birds can be seen there at various times of the year.

The salt marshes are spawning grounds for coastal and marine fishes. They provide feeding and nesting places for shorebirds and waterfowl, such as terns, gulls and sandpipers. The dunes are also the playground for rabbits and meadow mice. Clams, crabs, sand dollars and starfish can be gathered along the beaches. □

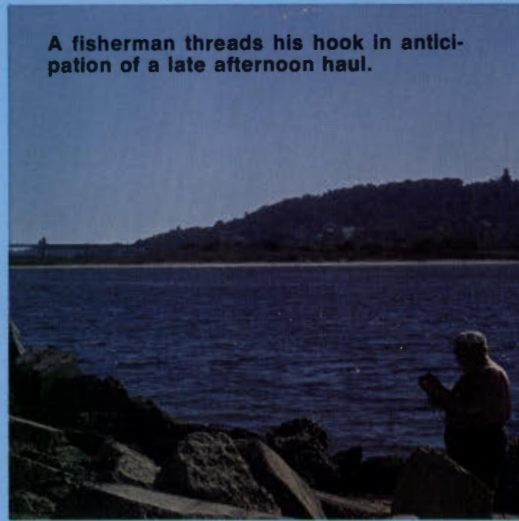
PHOTOS BY AUTHOR



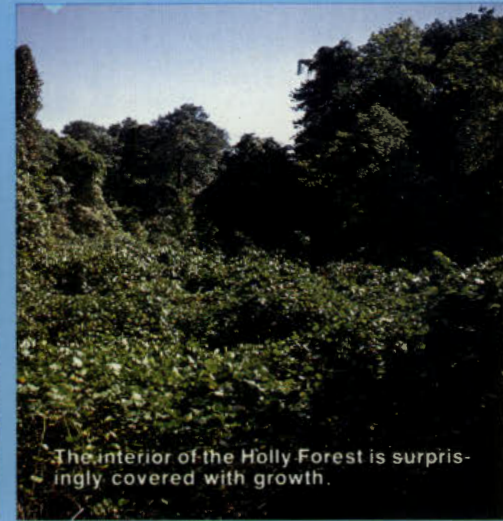
Ragweed grows out of the dunes.



A beach plum in winter. This year there were few plums from the bad winter of '78.



A fisherman threads his hook in anticipation of a late afternoon haul.



The interior of the Holly Forest is surprisingly covered with growth.

High Point—Carol Horling



New Jersey?



Fall Scene in North Jersey,
Pat Kingsland



Great Swamp—Jeff Keith



Great Falls of the Passaic at Paterson
Thomas Altavilla



Autumn Fields, Morristown Natural Historic Park
Gary Enters

Wildlife in New Jersey

THE MOURNING DOVE

BY
BRUCE HAWKINSON

The mourning dove (*Zenaida macroura*) is a member of the bird family Columbidae, the pigeons and doves. It has been known by different names throughout its history such as the "wild dove," the "rain crow," the "turtle dove," and the "grey ghost." The mourning dove is similar to the common pigeon in some characteristics; however, the dove is smaller, with a slimmer outline and a long, pointed tail. The dove's wings whistle in flight and can be heard from as far as 100 yards. Its plaintive cooing is primarily used by unmated males to attract females. Females rarely coo and never loudly. The cooing was originally thought to signal a coming storm, thus the name "rain crow."

In its early history, the mourning dove inhabited only what is now the southeastern portion of the United States; however, it has spread throughout North America and it now is found from southern Canada to Central America. This expansion was brought about by the extinction of the passenger pigeon and by the clearing of forestland for agriculture which increased the amount of available forest edge.

The mourning dove is fully capable of living in proximity with people; in fact, the ornamental plantings which suburban dwellers often favor, particularly evergreens, are excellent sources of nesting cover. Generally, mourning doves prefer evergreens for nesting early in the season and switch to hardwoods only later on as they leaf out. Where trees are scarce, as in the midwest, the mourning dove will nest on the ground. Nesting can begin as early as April but the peak occurs in mid-June.

The nest is crude but adequate to hold the average clutch size of two eggs. Incubation time is evenly split between the male and female. The eggs hatch in approximately 14 days. The nestlings are fed "pigeon milk," a substance regurgitated by the parents. Frequently a new nest is started before the preceding

brood is weaned. This multibreeding potential of the mourning dove enables it to raise three or four broods a season. The average pair of mourning doves can successfully raise four or five young each breeding season. The fledglings leave the nest on the fourteenth day and often group together with other young ones for a few days while attempting to locate food and water. Overall, one nesting cycle will last from 30 to 35 days. One interesting point is that mourning doves like to use robin nests, consequently where robin concentrations are high, dove nesting success may show an increase.

The foods that mourning doves like are mostly waste grains of corn and wheat left from the harvest and wild seed in fallow fields. The seeds of the grass family are favored by doves throughout their range. Mourning doves also eat snails, which may help fulfill their calcium requirement.

The mourning dove, like most members of the family Columbidae, migrates because it is of tropical and subtropical origin. It is poorly adapted for winter survival in northern regions. It must produce relatively more heat, to maintain its metabolism in a cold

ILLUSTRATION BY ROBERT PIERRO



climate than a nonmigratory species. Nevertheless, small numbers overwinter within their breeding range.

As a general rule, doves east of the Mississippi River migrate into the southeastern part of the United States, with some individuals traveling as far as the West Indies; however, most end up in the Gulf States. Birds banded west of the Mississippi River rarely migrate east of the Mississippi but move southward, and southwestward, into Mexico and Central America.

Sport hunting of the mourning dove is permitted in 33 states including Pennsylvania and Delaware. Uniform hunting regulations are set up by the U.S. Fish and Wildlife Service within the three dove management units—the eastern, central, and western. In the eastern management unit, there is a 70-day season with a daily bag limit of 12.

Predation represents only a small portion of the

total mourning dove mortality. Predators are the Cooper's and sharp-shinned hawks, owls, cats, and dogs. Animals which will raid a nest are blue jays, squirrels, and weasels. The big factor in dove mortality is weather. Severe spring weather and ice storms destroy nests and nestlings. Long periods of snow and ice will be detrimental to doves because they are ground feeders and cannot scratch through the ice. Eighty percent of all doves die their first year of life.

In order to keep track of dove populations throughout the United States, the Office of Migratory Bird Management in Laurel, Maryland, along with state cooperators, conducts surveys each spring. Of approximately 1000 randomly selected routes in the United States, three are in New Jersey. Through this census the condition of the country's population of mourning doves is determined and compared with other years. This ensures that the mourning dove will continue to exist and prosper for future generations. □



Continued from page 7

The Wallpack Valley

history of the Wallpack Valley. We know that the Dutch prospected for valuable minerals in the area at a time when New York was still New Amsterdam, prior to the English takeover in 1664. Some historians have suggested that the Dutch worked copper mines at a site a few miles north of the Water Gap and built a 100-mile-long road along the Delaware and Neversink rivers to transport the ore to Kingston. Other historians have argued that no mine was opened until much later, in the early 1700's. In any event, there is to this day a road along the Jersey side of the Delaware known as the Old Mine Road. Mining operations near the Gap continued sporadically until early in this century.

Several old stone houses built between about 1725 and 1750 still stand along the Old Mine Road. One of them was built by Isaac Van Campen, a member of the Continental Congress. John Adams traveled the Old Mine Road en route from Boston to attend Congress in Philadelphia and stayed with Van Campen.

In 1832, Abraham Garris built a grist mill on Mill Brook. This was followed by a general store, church, school, hotel, and the homes of craftsmen and others. Thus, the village of Millbrook was born. At its peak of activity, about 100 years ago, it was the economic, social, and religious center of a small farming community. But when railroads were built, they passed Millbrook by. Roads improved and farmers brought their products to larger towns for sale and did their shopping there. Also, local farmers were hurt by the growing competition from larger, more efficient, and specialized farms. Former farm land was abandoned and allowed to grow up with trees. The town of Millbrook declined.

Now, Millbrook is being recreated as a nineteenth-century town. Some of the original buildings remain and others

have been brought in from surrounding areas. Several homes and shops are furnished and open to the public.

Millbrook is at the southern end of the Wallpack Valley (actually, over a low ridge in the next valley). Following the Old Mine Road north from Millbrook, then turning right after crossing the Flatbrook, one comes to the town of Wallpack Center. Just south of town is an art gallery, the Water Gap Art Center. Nearby is a fine restaurant, the Walpack Inn, the only restaurant in the area.

Heading east down the main (and only) street of Wallpack Center one comes to an old cemetery, just outside town; many of the early residents are buried here. Crossing the intersection by the cemetery and heading up the hill ahead, one shortly comes to Tillman Ravine. Through this lovely hemlock glen, a path leads along Tillman Brook as it cascades down to the valley below.

Traveling a few miles north of Wallpack Center, one comes to Peters Valley Craft Village (labeled Bevans on some maps). Here, craftsmen work with metal, wood, ceramics, and textiles. Their shops are open to visitors. A gallery is maintained to show and sell their work and the work of other artisans.

But the main reason I go back to the area again and again is the reason I originally fell in love with the place—its natural beauty. I have already mentioned Tillman Ravine, above.

Janet McDowell wrote about Tillman Ravine in the May/June 1974 issue of *New Jersey Outdoors*. There are a number of other trails in the area. Most notably, the Appalachian Trail runs down a ridge of the Kittatinny Mountain which forms the eastern side of the Wallpack Valley. There are also a number of unmaintained and little-used roads in the area which may be hiked or driven on. (They abound in potholes—those with low-hung cars are advised to beware!)

I have not tried to present here a detailed description of the Wallpack Valley; this would take away from the fun of

exploring it for yourself. The beauty of the area is not overpowering. It is subtle. It doesn't have the magnificence of a Niagara Falls or the ruggedness of the Rockies or the remoteness of an Alaskan glacier. But it does have a yesteryear peace about it that I have found nowhere else.

Some specifics, if you go:

A good place to start your visit would be at the National Park Service information station, just off route 180 in the Water Gap. (Open daily April through October; weekends only, November through March.)

Millbrook Village is open daily, July through Labor Day.

The Water Gap Art Center, at Wallpack Center, is open Memorial Day to Labor Day on rather informal hours; generally weekends in June, every day in July and August. The gallery is sponsored by Artists for Environment, Star Route Box 14, Columbia, New Jersey 07832. Their Fellowship Program allows artists to live at the Recreation Area and to pursue their work for periods up to about three months.

The Walpack Inn opens daily at 5 PM (1 PM on Sunday) from mid-April to the end of November.

The studios at Peters Valley are officially open to visitors daily except Mondays, 1 to 4 PM, although you can generally find the craftsmen at work other times also. Please respect the craftsmen, as they are not salaried and generally must live off sales of their work. The gallery and craft store is open daily 10 to 5 except Monday, April through December. The Peters Valley Craftsmen sponsor weekend workshops, one- and two-week summer sessions, 10- to 13-week internship programs, and year-round residencies. For further information, call 201-948-5202 or write Peters Valley Craftsmen, Star Route, Layton, New Jersey 07851.

Still more questions? Write or call: Delaware Water Gap National Recreation Area, Bushkill, Pa. 18324. Telephone 717-588-6637. □

Millbrook General Store, Millbrook Village



Tillman Ravine





Sheila, Robert and friend

PETE McLAIN

Marine Mammals Stranding Center In Atlantic City

BY PETE McLAIN

There is a great interest by the public in saving whales, especially because several species are faced with extinction due to overexploitation.

However, other than people wearing T-shirts and displaying bumper stickers, little money is ever generated for the whales.

Down in historic Gardner's Basin in Atlantic City, two dedicated young people have been working against almost insurmountable odds in trying to save the whales and other marine mammals and turtles.

In a corner of the Basin they have erected a small headquarters, have a 24-hour telephone service and are known as the Marine Mammals Stranding Center. This is the first such center (to my knowledge) in the United States dedicated to salvaging and assisting marine mammals and reptiles which occur off the coast or become beached for one reason or another.

Robert Schoelkopf, 32, and his assistant Sheila Dean, 31, have been working under a CETA grant and the Atlantic County Man-

power Agency for the past two years. In that time, they have assisted 60 strandings of whales such as the sperm whale, beluga, pilot and several dolphins. They have also assisted with a number of sea turtles, mostly loggerheads, which have been injured, usually by boat propellers. While the success ratio is not high in salvaging whales, the information and techniques they record from the strandings are forwarded to the Smithsonian Institution, the National Marine Fishery Service and the State Division of Fish, Game and Shellfisheries.

Prior to the days of the Stranding Center, stranded whales and sea turtles were a major problem to shore communities which lacked the knowledge of how to care for or dispose of them. Presently, the Stranding Center is conducting most of the salvages under both federal and state permits. Schoelkopf spent several years handling and training sea lions and dolphins in Philadelphia and Atlantic City. Ms. Dean also has a background in training sea lions and dolphins and presently owns a 500-pound sea lion which lives at the Stranding Center.

In June these two biologists worked day and night to save a 12-foot pilot whale which came ashore in Wildwood in May. The whale was kept in a 14,000-gallon plastic swimming pool donated by the Shore Point Pool Company in Absecon. Veterinarians from Connecticut and Washington were not certain exactly what was wrong with the whale, except that it could not maintain its equilibrium and had to be supported 24 hours a day

lest it roll over and drown as water flooded its blow hole. These two workers took turns keeping the whale upright and also feeding it 40 pounds of mackerel a day to keep it alive. Late in June, the whale was transferred to Mystic Marine Life Aquarium in Connecticut where there is a staff to treat ailing marine mammals. It recovered.

The pilot whale occurs off New Jersey as they migrate up and down the coast. They travel in schools and the males are 18 feet long and may weigh 3,000 pounds. The whales breed when they are 7 to 12 years of age and, after a gestation period of 16 months, give birth to a single young which nurses for two years. One cannot help but be impressed with the almost human understanding of this sick pilot whale who seemed to know it was being helped while in the tank. It could easily bite a leg or arm off the biologists, but the whale was docile and seemed to appreciate the human efforts.

However, the chances of most whales recovering are slim, as only one beached whale in 100 survives. But this is the challenge the Marine Stranding Center accepts. Other than the CETA grant, which is due to terminate in October, the Marine Stranding Center survives on donations. Last year they collected only \$250. The National Marine Fisheries Service, under the Marine Mammals Act, has legal responsibility for whales. The agency's financial support is limited to supplying about \$200 a year in envelopes and postage. The N.J. Division of Fish and Game's Endangered Species Project provides \$500 a year to the Stranding Center to help in the salvage work.

What will happen to the Marine Stranding Center in October when the CETA grant runs out? Both Schoelkopf and Dean insist they are going to continue the program at their own expense. Possibly, some public donations will be forthcoming to help them. We hope so. □

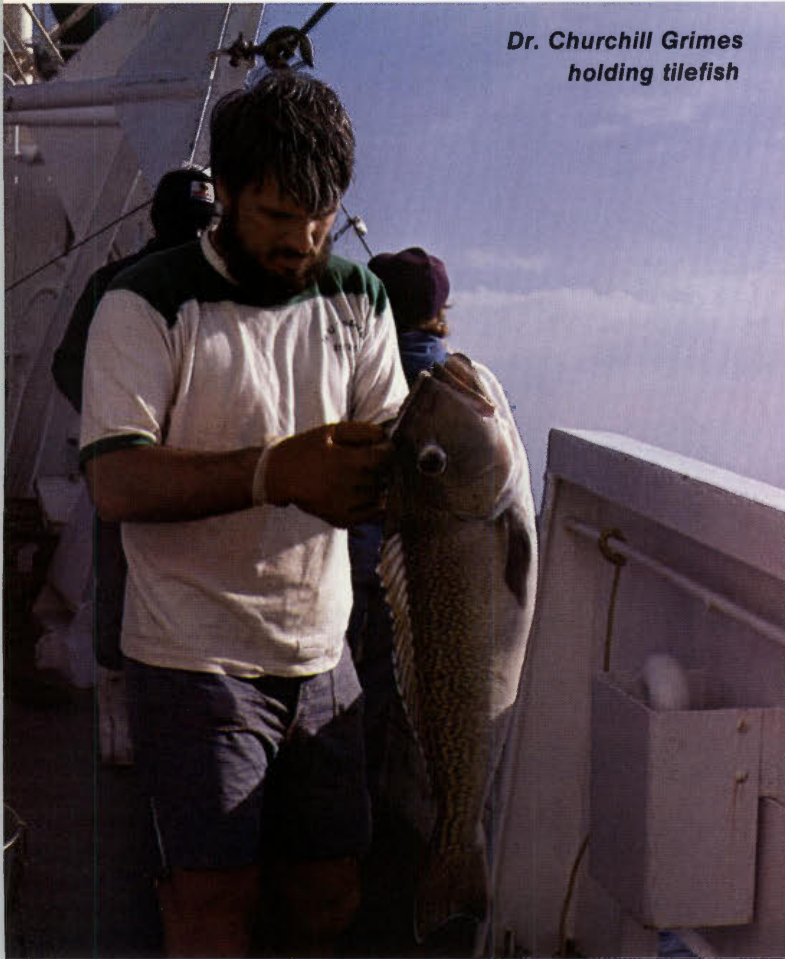
**"If you love
lobster
you'll like
tilefish"**



BY SUSAN BONSALE

New Jersey Marine Advisory Service

**Dr. Churchill Grimes
holding tilefish**



PHOTOS PROVIDED BY DR. CHURCHILL GRIMES

Pulling in a tilefish



This surprising expression has been making the rounds these days. But those who know how delicious tilefish really is and how well it sells have waggishly turned this around to say: "If you love tilefish, you'll like lobster." Can any fish really rival such an all-time favorite as lobster?

According to the initiated fish gourmet, firm pinkish-white tilefish flesh definitely provides a lobster or crab like taste treat. In fact, *Bon Appetit* magazine featured tilefish in its March 1979 issue, which surely earns tilefish, a place among the ranks of prestigious and palatable fish.

But more importantly, this mild-flavored, succulent fish produces profits in the pockets for many fisherman at Barnegat Light, New Jersey, which has been dubbed the "tilefish capital of the world." From here tilefish boats journey three to six days to the edge of the continental shelf and the deepwater canyons which tilefish inhabit.

Here the fishermen catch tilefish, those iridescent, pale green, blue, and yellow spotted fish, by long-lining. This entails stringing out miles of lines with baited hooks between surface buoys. Catches per boat average ten thousands pounds each trip over the year, with highs of thirty to forty thousand pounds in the spring when there is good tilefishing and lows of five thousand pounds or less in the summer when fishing is at its worst. Then it's back to the Barnegat Light docks to pack the tilefish and truck them to fishmarkets in New York City and other places.

This recent boom in tilefishing has created a fair number of jobs on Barnegat Light, a real boost to the local economy. But a larger question still remains. Can tilefish populations hold up under intensified fishing pressures?

Questions such as these are being addressed by two Sea Grant researchers at Rutgers University, Drs. Churchill Grimes and Kenneth Able, who are being funded by a National Oceanic and Atmospheric Administration grant. "The tilefish is really an interesting animal, but its biology is virtually unknown," says Dr. Grimes. "There has been almost no research done on the tilefish despite the fact that fishing is going great guns." So their overall research objectives is to develop a biological basis for the management of tilefish stocks in the Mid-Atlantic Bight. The need for such a management plan is a logical development in the series of events that boosted tilefish from relative obscurity into the limelight.

Tilefish have actually been around for a long time. The species was discovered in 1879 during a Smith-

Continued on page 32

NATURAL DYES

Black Walnut, *Juglans nigra* was a prized tree for its wood, its nuts as food, and the dark and lusty brown dyes the nut hulls produced without any additional chemicals. An iron kettle used as a dyepot would create a lasting black as the iron leached into the dyebath. The walnut hulls are very difficult to remove when green and at their best dyeing stage; dye-hards of today resort to driving over them with cars. They will stain your hands for several days, a characteristic the Indians purportedly made better use of. Butternut hulls, from the tree *Juglans cinerea* (White Walnut), are supposed to be just as good in the dyepot, and slightly easier to hull; unfortunately these trees are rare in southern New Jersey.

Light browns, khaki, grey, olive, and drab are not exciting colors in and of themselves, but at times dyers need duller shades to set off more brilliant hues or as part of compound dyes. As Witmer Stone lyrically wrote, "The swelling of the staminate catkins of the Alder is the first sign of awakening spring in the swamps of south Jersey. . . ." Alder, *Alnus rugosa*,

was sought when the sap was running. Small branches were collected, and the tannin-rich bark was stripped off immediately by children and dried in the shade; the bare branches were set aside for bean poles. Alder bark was another substitute mordant when preferred tannin sources weren't available; primarily it was used for grey-browns.

Nut-galls, an infection of the young buds on the smaller branches of some oaks, were the best source of tannin for home and commercial dyers if collected before the gall wasp (*Cynips gallaetinctoriae*) hatched; although there was much speculation about introducing this infection to American oaks on a large scale, we can be grateful that it was never done, and imported ground galls remained the primary source for commercial establishments. The home dyer used sumac instead of the costly and hard-to-come-by galls; there are three nonpoisonous sumacs in our area: Staghorn Sumac, *Rhus typhina*; Winged Sumac, *Rhus copallina*; and the most commonly utilized in the past, Smooth Sumac, *Rhus glabra*, also called Scarlet Sumac. The stalks were used for mordanting, and in yellow dyes with alum, and shoots and leaves in drab or slate; any part of the plant could be an additive to black dyes. The leaves were often dried



White Oak Leaf
(Browns)



Chestnut Oak Leaf
(Browns)



Sheep Laurel
(Olive-greens)



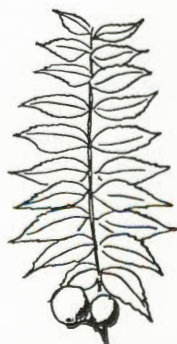
Arrow-Leaved
Tearthumb
(Yellows)



New Jersey Tea
(Yellows)



Tupelo Leaves
(Yellows)



Black Walnut Leaves and Nuts
(Browns)



Wild Indigo
(Blues)



Black Oak Leaf
(Yellows)



Smartweed
(Yellows)

and stored as powder for later use.

White Oak, *Quercus alba*, was used for a muddy tea shade called "Thee Bou," or added to other browns, as Chestnut Oak, *Quercus prinus* was added to red dyelots. Bark was stripped off the trees, chopped fine, and then boiled. The solution was then added to a dyepot as a stabilizer, and became especially popular around 1850-1860 as imported tannin sources became harder to get.

Hemlock, *Tsuga canadensis* is a straggler and rare in southern New Jersey, and a dyer should not count on using its bark for reddish brown coloring on wools. Disappointingly, Red Cedar, *Juniperus virginia*, an infinitely more common tree, is known only for khaki from its bark, twigs, small branches and berries. Sheep Laurel, *Kalmia angustifolia* (Lambkill, Pig Laurel, Dwarf Laurel), is a plentiful evergreen shrub known for its graceful spring blossoms; its leaves and twigs produce olive-greens in the dyepot.

Bracken Fern, *Pteridium aquilinum*, is abundant in our area, as Stone noted: "... the bulk of the undergrowth in open pine woods . . . large areas are covered by it alone, the flat tops of the fronds making an even surface which stretches away among the scattered trunks of Pitch Pines as far as the eye can reach . . ." As much as your hands can gather will dye your wools oliver-green, with mordants.

In 1856 mauve was accidentally discovered by a scientist in Victorian England and the end was in sight for natural dyes. By World War I the use of plants as dyes in the United States was very rare, except in some pockets of desperate poverty such as rural Appalachia and southwestern Indian reservations. Today this interrupted tradition is being revived as a hobby or as a modest cottage industry.

Why bother? Certainly it is easier to rip open an envelope of synthetic dye than to harvest and process bushels of plants with appropriate mordants and modifiers. But the enormous advances in industrial dye technology and expertise in dyeing fibers has gone into industry, and manufactured dyes available for home use are remarkably inferior to plant dyes and their commercial counterparts. Many plant dyes seem to have a remarkable vitality, subtlety, and depth which is lacking in synthesized colors, and a skilled dyer can create well over a hundred colors, shades, and tints from just a few plants and a handful of chemicals. In the rural areas of southern New Jersey, utilizing even a few of the more than 50 established dye plants described here, the natural dyer has available tremendous resources in every season.

Dye it yourself...

There are almost as many methods of plant dyeing as there are dye plants, and with the exception of Black Walnut hulls and Black Oak bark, which need no mordants, none of them are "natural." Without

the addition of chemical mordants and modifiers, most plants will produce weak and fugitive dyes. In the past, dyers resorted to nut galls, sumac, urine and other bizarre additives to get a wide range of permanent textile colors; today's dyers can simply order mordants and modifiers in refined, easy-to-use forms from mail-order suppliers or pick them up at local drugstores.

The approach described here is a pre-mordant, post-modifying method for wool dyeing. Wool is one of the easiest fibers to dye, and mordants alter its molecular structure to permanently bind with certain dye pigments rather than having colors just stain the surface. After dyeing, modifiers are used to create additional shades; by combining modifiers as many as 48 separate colors can be had from a single species of plant.

EQUIPMENT

Stainless steel or enamel pots or buckets are best. Smooth wooden spoons or rods turn the wool without snagging it. A small scale, accurate from 1/4 oz. to 4 pounds is used for weighing chemicals, wool and plants.

THE DYEBATH

Gather 4 pounds of fresh plant material for dyeing 1 pound of wool, or 4 oz. of dry materials.* Flowers can be fresh, dry or frozen; nut hulls, berries, leaves and stems ought to be used fresh. Roots, bark and twigs can be used fresh or dry; chop them into 1"-2" pieces and soak for 12 hours prior to dyeing.

Plant material can go loose into the dyepot with water to cover comfortably, or be put in a bag of loose, undyed cloth such as burlap, muslin or double-layered cheesecloth for easy removal later. Simmer for 90 minutes, just under a boil—higher temperatures destroy some colors and can harm wool.

WOOL

Wool can be dyed as loose fiber, yarn or fabric. Fleece "in the greige" may dye unevenly because of the residual lanolin; scour first if this is not what you want. Yarn should be made into skeins with loose loops tied around them. Make sure fabric has plenty of elbow room in the dyepot, and turn it more frequently for even dyeing.

MORDANTING

While the dyebath is brewing, mordant your wool. Dissolve the correct amount in a pot of water which will comfortably cover the wool, add wool and simmer for 90 minutes, turning the wool over every 20 minutes. Don't stir or agitate wool. Alum and chrome are the mordants; alum lays a light yellow foundation under the dye, chrome introduces a stronger grey-brown base.

For 1 pound of wool, use 3 oz. of alum (Potassium aluminum sulfate) plus 1 oz. of Cream of Tartar (Potassium bitartrate) in the mordant pot. The Cream of Tartar keeps the wool soft.

1/2 oz. of chrome (Potassium dichromate, also

*Exception—Black Oak Bark—4 oz. fresh to 1 pound of wool.

called Bichromate of potash) is sufficient to mordant 1 pound of wool—keep a lid on this pot—the fumes are dangerous!

Rinse pre-mordanted wool with hot water, and it is ready for the dyepot, or it can be dried and stored for future dyeing. Alum and chrome-mordanted wools can be dyed together—pulling two different colors out of one pot is always modestly thrilling.

DYEING

Remove dye plants from the bath, and add pre-mordanted wool. Cook just under a boil for 90 minutes, turning the wool every 15-20 minutes. If you like the results, rinse gently in hot water until it runs clear, and hang up to dry in an airy spot with no direct sunlight.

MODIFYING

If you want several shades from one dye session, put several units of wool in the dyebath, and modify them later. Remove half-enough liquid from the original dyebath, and add an equal amount of water, plus the proper amounts of modifiers. Add the dyed wool, and simmer just under a boil for 30 minutes, turning frequently. Rinse carefully in hot water until it runs clear; hang up to dry.

For one pound of wool you will need:

1/2 oz. Iron (Copperas, also called Ferrous sulfate or Green vitriol) plus 1 oz. of Cream of Tartar. Iron “saddens” the dye color, darkening it with a grey tone; yellows turn towards green, red-oranges toward browns. A handful of rusty nails in the pot, or an iron pot itself will have the same effect.

Or 1/2 oz. Copper (Blue vitriol, or Cuprous sulfate). Copper has a “Blueing” effect, turning yellows to mellow gold. A copper dyepot can contribute the same.

Or 1/2 oz. Tin (Stannous chloride) with 2 oz. of Cream of Tartar. Tin is a brassy brightener, making colors fairly glow. At times, this vividness fades.

Turning your dyebath to acid or base can produce appreciable hue changes. 2 cups of white vinegar (mild acetic acid) added to a base dye liquid can make unexpected variations; yellows go to green, oranges to copper. 1/2 cup of clear household ammonia for one pound of wool can dramatically alter an acid liquid—yellow can change to a darker orange; a rust can go towards red. Test your dyebath by removing a spoonful and adding a few drops of vinegar or ammonia; if it is neutral then both can be effective, used separately. Or buy some litmus strips at a drugstore for testing.

Modifiers can be used in combinations—for instance, adding iron and ammonia to a coreopsis dyebath with an alum-mordanted wool change the yarn from yellow to dark brown. As many as 48 shades are available from one species of plant if you use all the possible mordant and modifier combinations!

FASTNESS

To test for fastness to light, expose dyed wool to 3 weeks of direct sunlight from 10 a.m. to 3 p.m. Compare with an unexposed sample. To test for wash-fastness, stitch a piece of dyed wool onto a small piece of white cotton; wash by machine or by hand. Compare the washed sample with an unwashed one, and look for staining on the cotton.

SOURCES OF SUPPLIES

The following list has suppliers who are reliable and carry good quality mordants, modifiers and plant materials.

Write for a catalogue and prices.

“The Mannings”, R.D. #2, East Berlin, Pa. 17316

“Alliance Import Co.”, 1021 R St., Sacramento, Ca. 95814

“Gordon’s Naturals”, Box 506, Roseburg, Oregon 97470

“C.D. Fitzharding-Bailey”, St. Aubyn, 15 Dutton St., Bankstown, N.S.W. 2200, Australia (Best cochineal and indigo)

BIBLIOGRAPHY

“Dye Plants and Dyeing”—a handbook. Brooklyn Botanic Garden, Brooklyn, N.Y. August, 1973.

Field Guide to Wildflowers of Northeastern and North Central North America, Roger Tory Peterson and Margaret McKenny, Houghton Mifflin Co., 1968.

Gray’s Manual of Botany, M.L. Fernald. American Book Company, Harvard University, 4th. Edition, 1950.

How To Know the Wild Flowers, Mrs. William Starr Dana, Charles Scribner’s Sons, New York, 1912.

Natural Dyes in the United States, Rita J. Adrosko, Smithsonian Institution Press, Washington, D.C., 1968.

“*Natural Plant Dyeing*”—a handbook. Brooklyn Botanic Garden, Brooklyn, N.Y. Special Printing of *Plants and Gardens*, Vol. 29, #2, 1973.

The Plants of Southern New Jersey, Witmer Stone, Quarterman Publications Inc., Boston. Original edition published in 1911 as Part II of the “Annual Report of the New Jersey State Museum”; reprinted 1973.

“Rare or Endangered Vascular Plants of New Jersey,” David Fairbrothers and Mary Hough, Department of Botany, Rutgers University, New Brunswick, N.J. *Science Notes* #14, New Jersey State Museum, November, 1973. Reprinted March 1975.

The Tree Book, Julia E. Rogers. Doubleday, Page and Co., New York, 1907.



Handspun yarns dyed with goldenrod, coreopsis, and mordants and modifiers

you'll like tilefish

sonian exploratory cruise. But no commercial fishery developed because in the 1880's a shift in ocean currents brought abnormally cold waters into their environment, causing populations to decline drastically. Tilefish numbers rebounded in the early part of this century and in 1916 ten million pounds were landed, the largest number to date.

Through the years, the tilefishery has fluctuated from a few thousand pounds per year to several million pounds. But the fish never really caught on the public. "In fact," says Grimes, "they weren't necessarily called tilefish in the marketplace but were sold under a variety of names and as the base for fishsticks and fish portions."

Then in the late 1960's tilefishing caught on with sportsmen. In the past, other sport species such as bluefin tuna, swordfish, and blues drew sportsfishermen to Barnegat Light. As these fish became more scarce, tilefish swam in to fill the void. Here was a relatively unknown fish they could go after and catch in quantity.

Further, through the hard-working efforts and farsightedness of Captains John Larson and Lou Puskas, tilefish came back onto the market commercially as well. Larson and Puskas took their party boats, normally used minimally during the winter months, and went after tilefish which they then sold commercially, mostly to gourmet restaurants at first, then on the fresh fish market.

The word spread quickly after that. More and more commercial fishermen, mostly from Barnegat Light, invested in bigger and better boats so they could go tilefishing.

According to Dr. Able, "during the period from 1973 to 1978 tilefish ranked eleventh, eighth, sixth, fifth, third, and third again in finfish dollar value in New Jersey. In 1978, the tilefish boats brought in more than 4 million pounds of fish valued at 2.3 million dollars—quite a jump from the almost 3 million pounds valued at 1.4 million dollars in 1977."

This recent, intensive focus on tilefish creates a need to know more about the species. And this is just what Grimes and Able are working on. "Management of any animal resource is based on a sound knowledge of its population biology," says Grimes. "We need to under-

stand such things as age, growth, mortality, sexual maturity—just about everything."

Locally, the Barnegat Light fishermen have been very helpful. While most government-funded studies directed toward fish management don't exactly thrill fishermen, they do recognize a need to know more about the tilefish. So they've allowed samplers to go out onto the vessels to measure lengths and weights and obtain biological samples from thousands of tilefish. In addition, Grimes and Able bring hundreds of locally caught tilefish back to the lab where they take the stomachs and gonads plus samples of eye, liver, and muscle proteins. And they take the fishes' otoliths.

According to Grimes, "one way to age the fish is by using the otolith, a calcium carbonate concretion in the fish's inner ear—an ear stone, you might call it. These otoliths have a ring structure much like the rings on a tree. We examine some otoliths whole, others we section and examine microscopically to determine age." This information is then correlated with other data to validate the otoliths as annular marks.

Another aspect of their research is devoted to what they call "racial" studies. Here Grimes and Able are trying to find out if genetically definable subunits or races exist within the range of the fish. Since tilefish range from the Gulf of Maine to Guyana and throughout the Gulf of Mexico, the researchers have cooperated with commercial fishermen and the National Marine Fisheries Service to get fish samples from these far-off areas.

All the data Grimes and Able gather are subjected to rigorous statistical analyses. Preliminary "racial" study results show that the tilefish from the Gulf and South Atlantic are closely related, whereas those from the Mid-Atlantic are genetically different from the southern fish. "These differences are important in planning a management strategy," says Dr. Able. He states that "if genetically distinct groups exist over the range of exploitation, then there are different population dynamics at work. The fish will grow differently, live to different ages, and so on. Therefore, a different management strategy is needed to optimize harvest from each group."

It will be about two more years before Grimes and Able will have the data they need to develop a model which will allow them to examine the effects of different fishing methods and efforts on tilefish populations. In the meantime, the fast-becoming-popular tilefish is off and running in the marketplace. □

FRONT COVER

Fishing on the Mullica River in South Jersey—Photographed by Harry Grosch

INSIDE BACK COVER

Mourning Dove—Illustration by Carol Decker (See article on page 24)

BACK COVER

Autumn Colors at Hopkins Pond in Haddonfield—Photographed by Richard Montemurro



Carol Decker ⁹
© '79

