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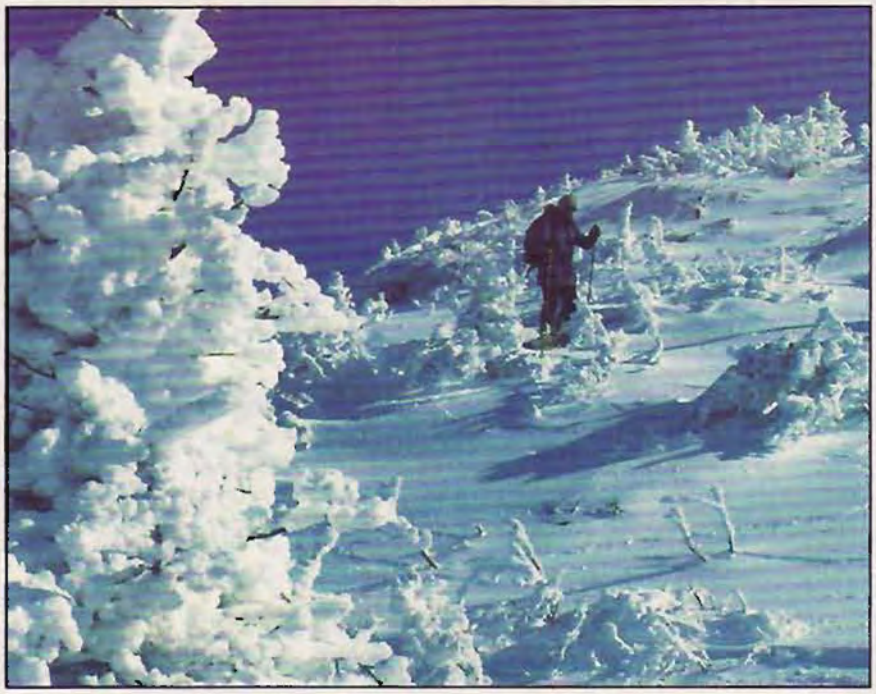
Our Cover: "Brighten the Season" — Cardinal by Gregory K. Scott
How can winter be the somber season when it is punctuated by the bright red flash of a cardinal going about its daily business?

Cover II: Opossum by Paul Blasko

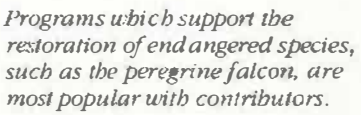
Cover III: "Snowglow" — Watercolor by Tom Stratton

Cover IV: "Winter Alert" — Whitetail buck by Edward Jakubowski



Return a Gift to Wildlife Completes Its Eighth Successful Year

by Andrea Marlar



Programs which support the restoration of endangered species, such as the peregrine falcon, are most popular with contributors.

Peregrine falcons, eastern sand darters, cricket frogs, bald eagles, Reinstein Woods Nature Preserve, *New York's Breeding Bird Atlas* and Project WILD — What do they all have in common? They have all benefited from public contributions to Return a Gift to Wildlife during the past eight years.

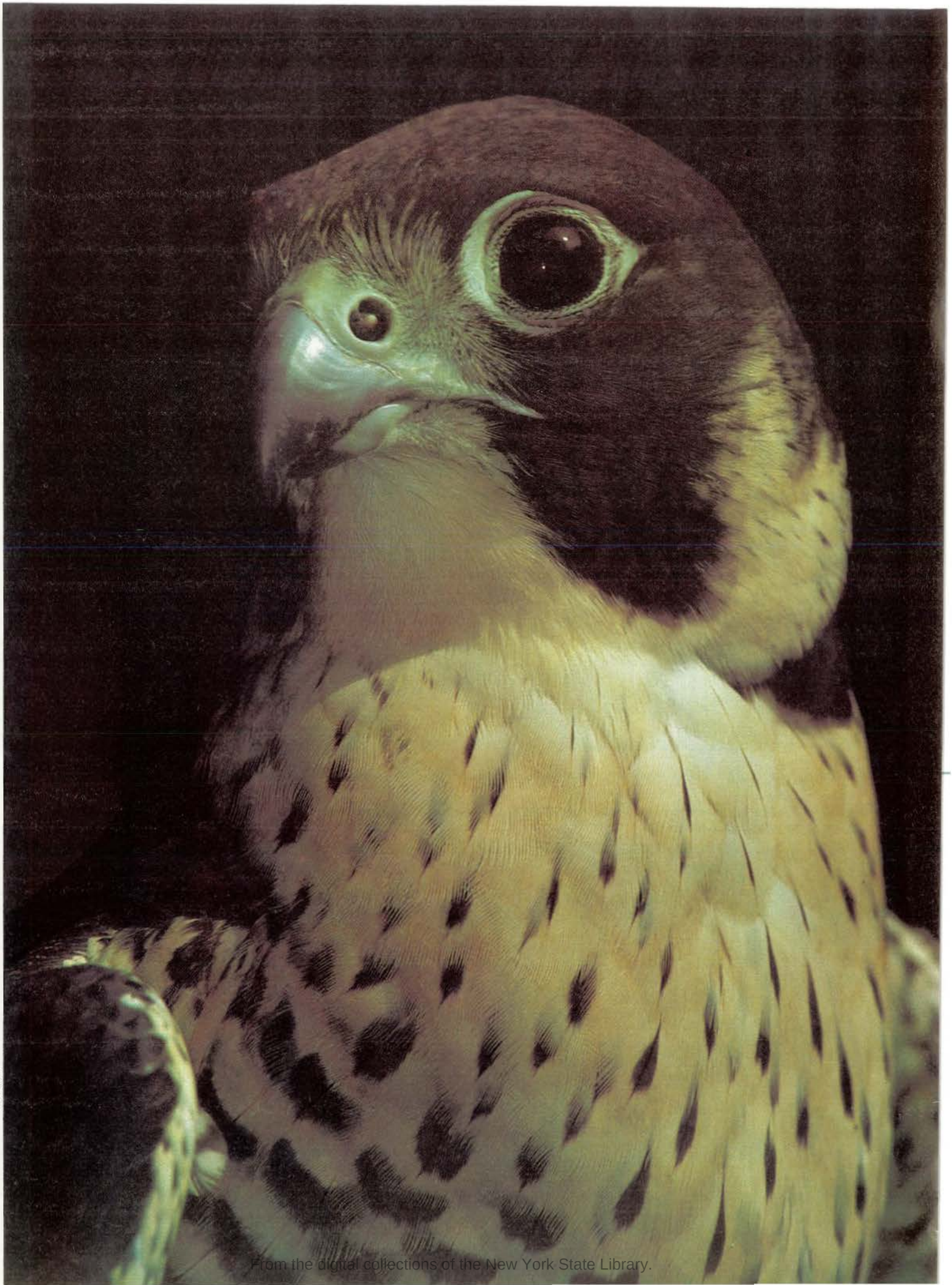
Since 1982, approximately 300,000 taxpayers have contributed money annually to the Return a Gift to Wildlife Fund by way of their tax form, causing the total revenue to exceed $13 million, an amount more than any other state with a similar program receives. As a result, more than 175 projects have received financial support.

There is a common misconception that Return a Gift to Wildlife is an additional tax. But in reality it is a voluntary tax-deductible contribution. And the contribution process is simple. All one has to do is to write in the amount of one's contribution on the IT-100, 200, 201 or 203 state tax form. The amount of the contribution will then be deducted from the tax refund, or if taxes are owed, included in the check to the Department of Taxation and Finance. The contribution is deductible on the following year's tax form.

Although the tax form is the most popular method for contributing to RAGTW, direct contributions may also be made. A popular way some have chosen to contribute is in memory of a loved one.

Return a Gift to Wildlife is a funding source for a wide variety of fish and wildlife related projects. The contributions make it possible for these projects that either lack funding from other sources or that require supplemental funding to continue to expand. In addition, RAGTW allows many important projects to get off the ground.

The diversity of work is immense, and is beneficial to the welfare of all inhabitants of New York State, both animal and human. The projects range from those concerned with outdoor education and biological study, to law enforcement and data gathering, all of which are important to the protection and maintenance of the state's fish and wildlife resources.



P. Schnell

The nature trail at Floyd Bennett Field in Brooklyn is funded in part by RAGTW funds.

D. Nelson

Placing a radio transmitter on a Blanding's turtle

DEC photo

Through the efforts of organizations such as Okeanos, sea mammals such as this gray harbor seal are studied and protected.

Okeanos

Traveling exhibits, such as this one with an American bald eagle, help keep the public informed about the work of RAGTW.

DEC photo

Educational posters are part of RAGTW's teachers' packets. This 1991 poster painting is near completion. Wayne Trimm

Cornell University was enlisted to conduct research on public interest in RAGTW. More than 50 percent of the seven million taxpayers were found to be aware of the program. Individuals knowledgeable about the program generally feel money should be spent on protecting threatened and endangered species.

According to New York State's Environmental Conservation Law, a species is considered endangered when it is in imminent danger of extinction in New York State or nationally. One important project for example focuses on the Kemp's ridley sea turtle, one of the most endangered sea turtles in the world. Thanks to research funded by RAGTW and private oceanographic organizations, the importance of the New York habitat in the life cycle of these turtles has been discovered. Further understanding of the turtles' behavior patterns has enabled those involved in their protection to do all that is possible to increase populations, and ensure their continued existence.

Tern populations throughout the state are another area of concern. RAGTW funds are currently being used to protect nesting areas for several species of terns on Oneida Lake, Lake Ontario, Long Island and the Niagara Frontier. The main problem being addressed is the displacement of terns by other birds. Terns are moving from traditional nesting sites to man-made structures. The most successful project to counter this problem has been with a grid of netting that protects tern nesting sites from other species, while allowing terns to pass. This technique is being implemented at nesting areas throughout the state.

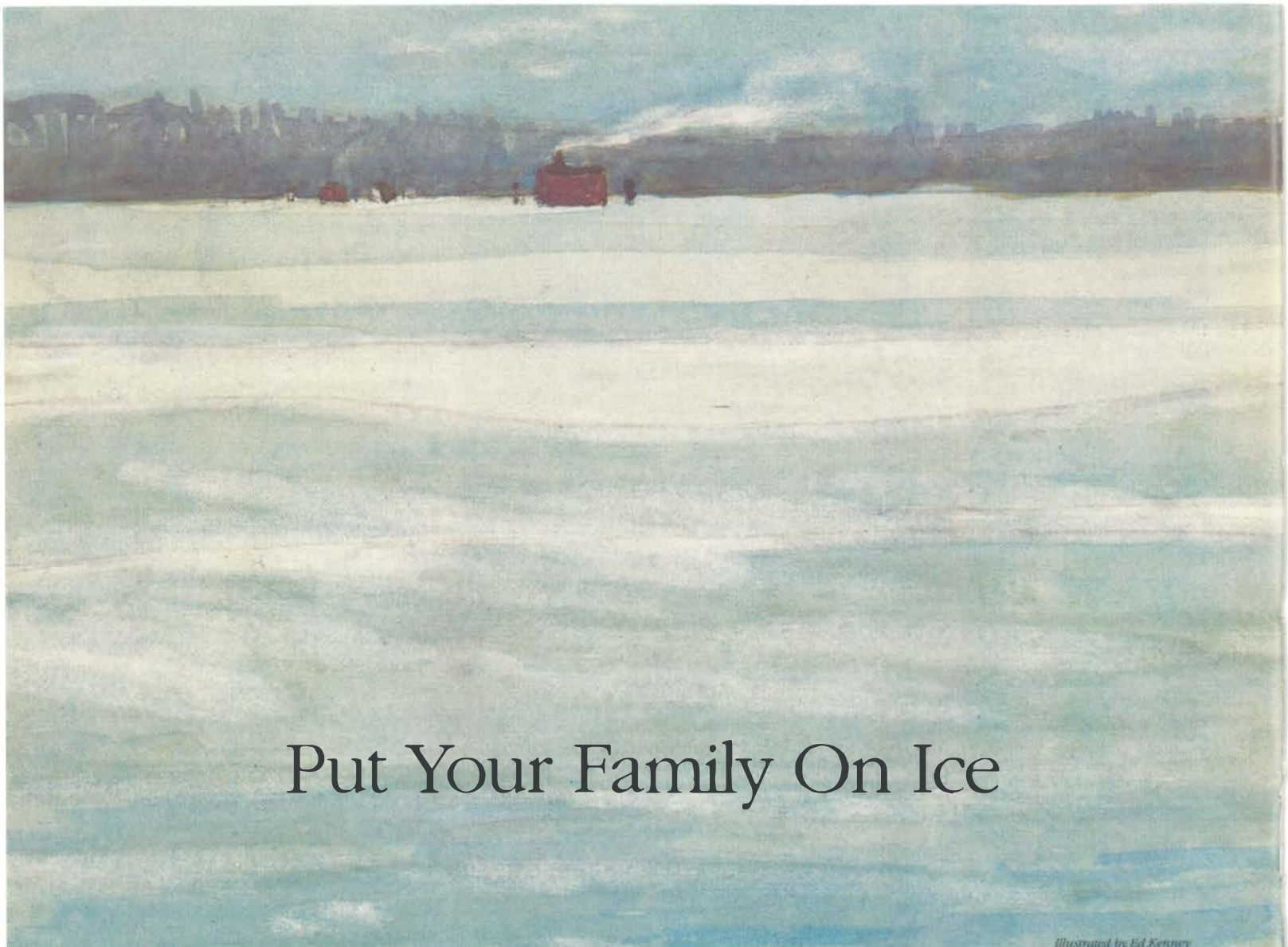
Another focus is that of environmental education. Project WILD is aimed at teaching those interested in how to relay an environmentally conscious message. Those participating in Project WILD are generally school teachers. However, many concerned citizens have also participated. As a supplement to educational materials provided by Project WILD, those interested can receive educator guides and teacher packets including posters to use in a variety of teaching situations.

Education and management efforts of endangered species are all major and constant concerns, but projects that may not seem of high priority are often necessary. One such project is determining the fate of relocated suburban raccoons. This is important in order to determine how rehabilitated or relocated raccoons react to such displacement. Another project is the Master Habitat Databank, which provides easily accessible information on New York's fish and wildlife habitats. RAGTW funds have also been used for studying the effects of turfgrass pesticides on wildlife, for nest box construction, for endangered species law enforcement and for protection of critical habitats. Some projects are termed continuous and are funded yearly. The Wildlife Information Services Hotline, and the video loan library are just two examples. Another category of projects is those which are under contract for a specific length of time. Fish pathology services were contracted for three years and investigation of tiger salamander habitat use was another three year contract.

The work accomplished as a result of contributions to Return a Gift to Wildlife has been of great benefit to a number of fish and wildlife species and their habitats and has been a source of much enjoyment and appreciation for thousands of people living in or visiting New York State.

If you have not already done so, why not make a contribution to Return a Gift to Wildlife on your 1990 tax return?

Andrea Marlar is an environmental education assistant in the marketing unit of DEC's division of fish and wildlife. She is a recent graduate of SUNY (Oswego).



Put Your Family On Ice

Illustrated by Ed Kenney

Fishing through a hole in the ice on one of New York's many lakes is one of winter's greatest sporting pleasures.

by Jill Barnes

When the leaves begin to fall from the trees, most anglers are storing their rods for winter. They don't know what they are missing. Instead of waiting for the winter snows to melt and the spring thaw to begin, they could be seeking the same prey they enjoyed catching during the warmer months. The sport to try now is ice fishing. Those bundled winter anglers can catch a variety of panfish (sunnies, perch and crappies), or possibly a trout, pike, muskie, walleye or bass.

Ice fishing also can be a family endeavor. It is never too early to take a youngster fishing, even if the water is frozen. It just takes a little more preparation and a bit more patience. And with the numerous bodies of water — both large and small — New York State has to offer anglers, there are plenty of opportunities to go it alone or take the family.

When taking kids, it's a good idea to be prepared. First, take extra clothes. Kids have a way of dunking a foot or hand in the water. Sunny days with little wind are probably the best times to venture out with the family, providing the ice has had adequate time to freeze. The sun can make pleasant situations when the temperatures are well below freezing.

Besides the basic fishing equipment, blankets, food, hot chocolate, sled and ice-skates might be part of the basic essentials. You may see a reason for the blankets, food and hot chocolate, but sled and ice skates?

A sled can come in handy for two reasons. Whether or not you bring along kids, a sled can be used to haul equipment to your favorite fishing spot and it makes an excellent seat while fishing. It also can be used to entertain the kids if they get bored. A child's attention span is limited, even when the weather is ideal and

If you start them fishing when they are young, they will be devotees for the rest of their lives. J. Barnes

the fish are biting. With a sled, they can take time out to slide across the ice, unless there is too much snow. Ice skates also can provide a diversion when the action gets slow. Hot chocolate and snacks keep the spirits up.

Fishing equipment is less elaborate than summer counterparts. There are two basic types of ice fishing rods — the traditional tip-up or a three-foot long pole, which resembles a regular fishing rod. Many fishermen, especially kids, prefer the short pole over the tip-ups because it provides a little more action. An angler can feel the strike with a rod in hand, thus adding to the excitement.

Hand-held poles also give the choice of using bait or artificial lures. Baited hooks, used with the tip-ups, usually just sit near the bottom. Those using the short pole can work a lure — jigging it under the water — to entice the fish.

Small silver tear drop lures can be used as jigging lures. Many fishermen also add grubs or mealworms to the hook. Some of the more successful lures include: the Swedish Pimple (a silvery body with a small, red tail that flutters when it moves), a Mister Twister or any Rapala-type ice fishing jig. Because the fish are not as active in winter as in summer, a slower retrieve is necessary when jigging. Kids sometimes jig with a little too much gusto, but you never know what kind of erratic action will make a fish strike. You may want to let your child pick what lure looks best to him or her. It keeps their interest up and it might even catch fish.

Light line, two to six pound test, is the norm for the smaller panfish. If the drag is working properly, that test line also should hold if you hook into something bigger, such as a good size pike or muskie.

Breaking through the ice can take many forms from a hand-held chisel to some souped-up power auger. The power auger works best if the ice is very thick,

Fishing shanties, Westport on Lake Champlain J. Geary

which was the case early last winter. With the frigid December temperatures, the ice on most New York waters was at least 18 inches by New Year's Day. But weather conditions change quickly. After having one of the coldest Decembers on record, we had one of the warmest Januarys. So always proceed with caution when venturing out on the ice. Six inches or more usually provides adequate thickness. Common sense, though, works best. Every year, many fishermen fall through the ice because they are too eager to start the season, not willing to see it end or don't pay attention to warming trends. The buddy system also is a good idea; then you have help nearby just in case something does happen.

For those lacking the high-tech ice chopper, some tackle shops will rent augers or other fishermen will drill a hole for you for a fee. Or you could fish a "used hole." Getting up early can afford you a spot used by someone else the day before, or if you have time, a Monday after a fishing weekend can offer its share of prime locations.

With a little care, keeping yourself and the kids warm during an outing need not be a problem. Most warm clothing used for regular outdoor activities will serve well while ice fishing. The key is to keep your head, hands and feet warm.

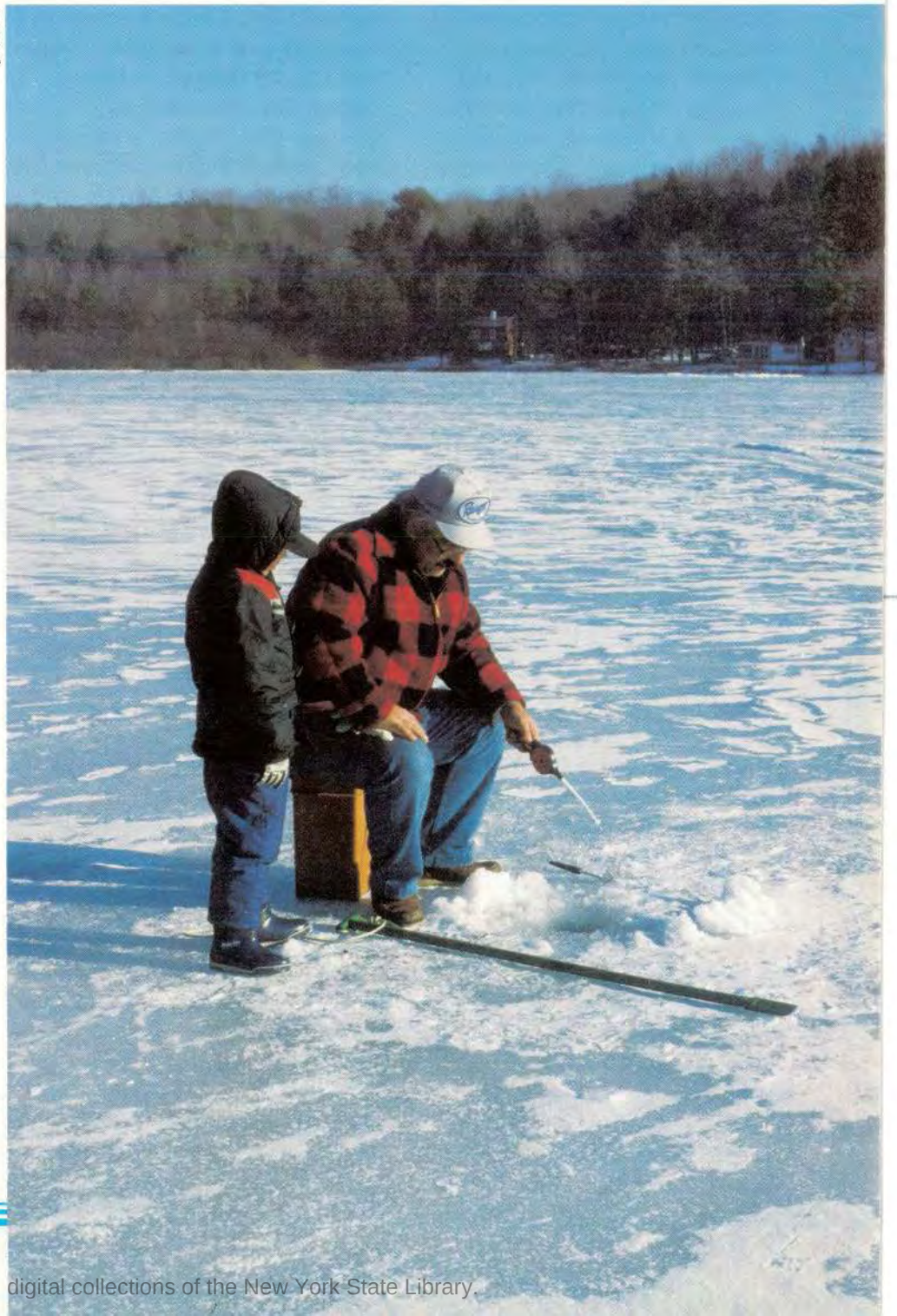
A wool cap and a hooded jacket should provide enough head warmth. My son, however, doesn't care for a stocking cap. He says it makes his head too itchy. He prefers one of those insulated baseball-type caps with the ear flaps that either tie or have a Velcro strap under the chin. Kids sizes are not always easy to find in stores, but many of the outdoor catalogs have them. I also found them in adult sizes and bought one for myself.

Keeping hands warm sometimes is a problem. You can keep them toasty by just leaving them in your pockets if you are using a tip-up. Hand warmers provide some relief, but make sure you dry your hands thoroughly after reeling in your catch to prevent frostbite. A good pair of insulated gloves also does the trick. One of the best pairs I bought came from a scuba diving store.

Insulated rubber boots and wool socks are fine for your feet. If you have a tendency toward cold toes, electric socks (powered by a battery) can keep your feet warm even in the coldest climes. Another good idea is the less bulky type boot used in snowmobiling. The boot is

Two generations of ice fishermen

J. Barnes



rubberized to keep the feet dry but porous enough to allow perspiration to evaporate. It's also smart to bring something to stand on, such as a piece of wood or cardboard, so your feet are not in direct contact with the ice.

Sheds, ice shanties or modified tents on ice runners are other ways of keeping warm. Some are lightweight and compact enough to fold. Those little housing units on the ice can really keep the cold out, especially if equipped with a small stove or lantern. A radio also adds a homey touch. Any kid would go for that type of comfort, but it really isn't necessary.

Armed with the correct equipment and clothing, the question now is where to fish? The answer is simple — any New York lake that produced fish in warmer weather. And in winter, the fish are more likely to be in the same place tomorrow and several days after that because fish travel more slowly at this time of year. If you have a map of the pond or lake (many area bait shops or county agencies have them), study the contours of the bottom. The mouth of feeder streams can be a key area, especially after a rain or a warm day because of the influx of food.

Many counties, particularly the Southern Tier, have a number of small private lakes just full of panfish such as perch, sunnies and pickerel, that need thinning out. Some of the lake associations will give outsiders permission to fish. It might be a good idea to work out a deal. Ice fishing now for some later summer help around the lake might be profitable for both parties.

Catching a large variety of fish means using different tactics. Panfish roam near weedbeds located by channels, dropoffs and deep-water points. Waxworms, mealworms, red worms and grubs are the best baits for panfish. Most smaller ponds and lakes have perch, sunnies and pickerel. But larger bodies of water also are profitable. Oneida Lake, Seneca Lake, Canadarago Lake and the Wellesley Island area of the St. Lawrence River are good places for tasty yellow perch.

Cheese, ice spoons and larval baits can be deadly on trout. Fishing the deeper water where weeds are present can also produce fish. Lakers are a choice catch on Lake Champlain. They also can be hooked in Lake George if you can get down deep enough. Greenwood Lake on the New York-New Jersey border has been known to yield some brown trout. In the past five years, DEC has stocked the lake with muskies, which are now beginning to turn up on ice fishing rigs.

Walleyes and northern pike are considered winter trophy fish. Both feed on baitfish (shiners and smelt), but they also attack artificial look-alikes. Walleye anglers should look for gravel-bottom areas with bars and humps. Oneida Lake is a good choice for walleye in winter, particularly near Pancake Shoals. Lake Champlain, Chautauqua Lake and Canadarago Lake also are good choices for walleye.

Those going for pike should work the deep edges of weedbeds. Black Lake in St. Lawrence County usually freezes early, providing eager anglers pike possibilities. Saranac Lake, Tupper Lake and Lake George also offer pike.

Ice fishing for bass is allowed on certain lakes around the state, but check the DEC fishing guide for restrictions. They can be taken the same way as the pan fish but are sluggish in cold water and usually are caught by accident.

If the action is a little slow, chumming (using bits of fish, worms or other bait) sometimes brings the fish. Grind or cut tiny pieces of bait and mix with dry oatmeal or crushed eggshells and place it in a weighted chum pot. Drop the pot into the hole along with your line. It will attract smaller fish which then attract the bigger ones.

Pike and pickerel primarily are day feeders, so it usually doesn't pay to keep ice fishing for them into the evening. Other fish, particularly walleye and perch, continue to feed into the night. You can fish for them until you can't see the flag on your tip-up.

If you are not sure where to start fishing, ask around. Your local tackle shop can supply some helpful hints and will point you in the right direction. Most tackle shops try to give reliable information; they want return business and bum tips don't help.

One of the simplest methods of finding the fish under their ceiling of ice is to take a quick survey of the area. If there are plenty of other hearty souls like yourself out there, then it's a safe bet the action is good. Ice fishermen seem more willing to talk about where the fish are biting than their warm-water counterparts. Maybe it's a fear that their tongues will freeze without use that makes enthusiastic talkers out of usually quiet anglers. After choosing a likely location, pull up a sled or bucket to sit on, light your camping lantern for extra warmth — and enjoy. And don't forget to bring the family.

Jill Barnes is a freelance writer who makes her home in Fair Lawn, New Jersey. She is a member of the New York Outdoor Writers Association as well as the Outdoor Writers Association of America. She has had articles published in *Game and Fish, Outdoor Life, Bassmaster, Petersen's Fishing* and *Outdoor Woman*.

Wind Chill Factor Makes It Colder Than You Think...

by Tom and Joanne O'Toole

Cartoons by Tom Payne

Some outdoor people think cold weather is invigorating, while others think it's down right insufferable. Checking the temperature is not always a reliable indicator of how cold a person will feel outside, because there are other determinations. It might have something to do with blood, or maybe age. Perhaps even the wind chill factor.

There are a number of definitions for the wind chill factor, but essentially it is the relative cooling effect resulting from wind and temperature on the human body. Wind moving past exposed skin during cold weather increases the body's heat loss. The body pumps warm blood to the extremities in an attempt to maintain the proper body temperature. However, if the temperature is low, and the wind strong, the body sometimes cannot keep up with heat loss, and the skin temperature decreases. While the usual effect of the wind chill is just plain discomfort, freezing of exposed portions of the body *can* result.

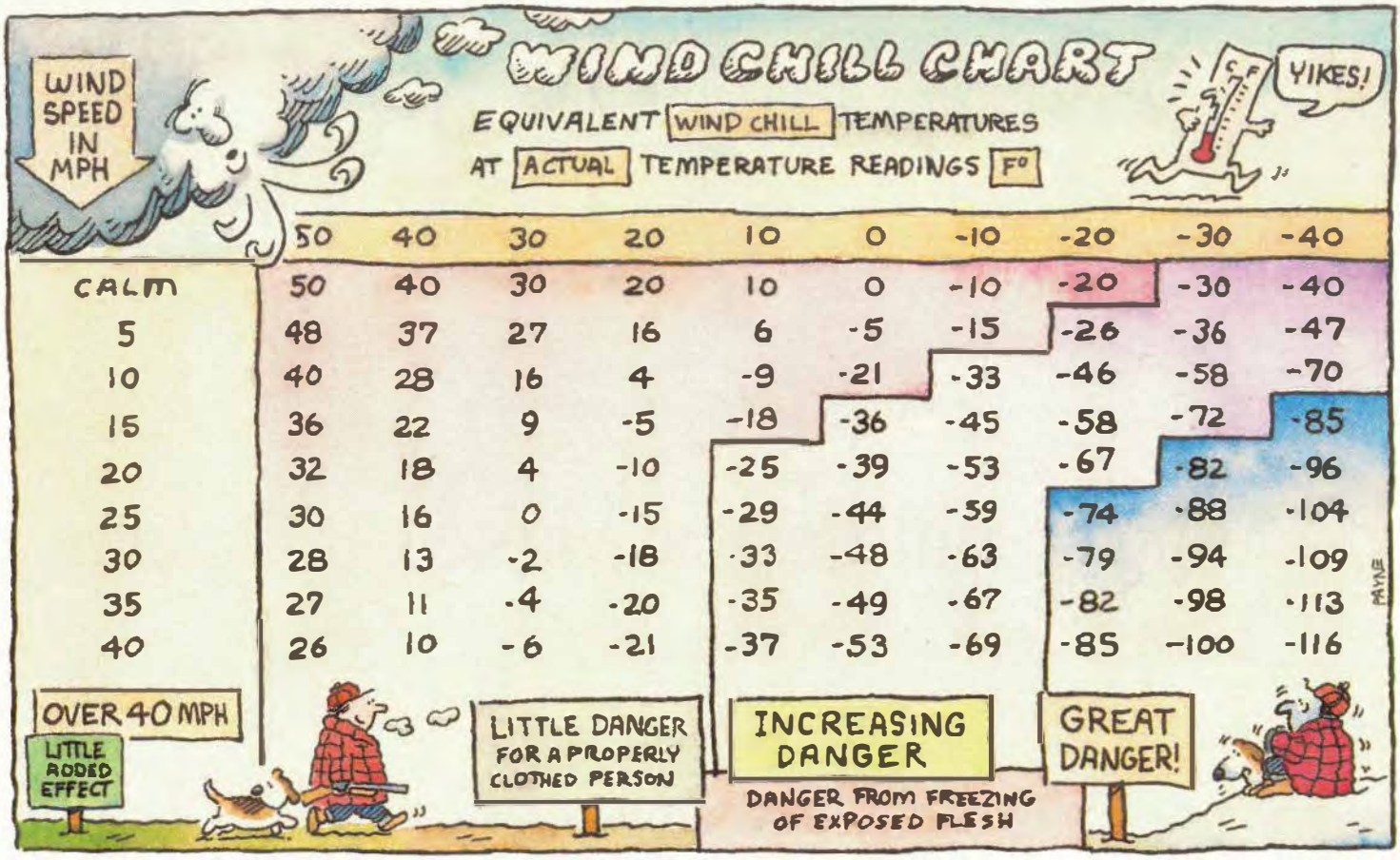
A scientific definition to that elusive characteristic of the weather known as "cold" was first put forth by Antarctic explorer Paul A. Siple and his colleague Charles F. Passel in 1939. Siple coined the term "wind chill" to describe their concept of the relative cooling power (or heat removal) from the human body with various combinations of wind speed and low temperatures.

Wind chill has gained popular acceptance because it is easy to understand. Knowing the factors involved can help you guard against frostbite and hypothermia. Frostbite is tissue damage caused by exposure to intense cold, and usually occurs when wind chill temperatures fall below -25 degrees F. Hypothermia is the rapid lowering of the body's internal temperature, greatly affecting judgement and sometimes resulting in death.

[See following article]

On a calm day (no wind) with a temperature of say 20 degrees F., the temperature as it relates to the body is that same 20 degrees. But when the wind starts blowing, the temperature affecting exposed skin drops dramatically. If the wind is a relatively slow 10 mph, the wind chill factor is already down to four degrees F. If it's blowing at 15 mph, the wind chill plunges to five degrees *below* zero.

The stronger the wind during a given temperature reading, the lower the wind chill factor. It is the relationship between wind speed and actual temperature that produces the chilling effect. A further concern is for outdoor enthusiasts who create their own wind or increase the existing wind — skiing, snowmobiling and running for example. Their movement magnifies the air flow,



so they should be especially aware of the wind chill.

When someone says the wind is "penetrating," what actually happens is the air movement evaporates moisture from the exposed skin, decreasing the temperature. In the summer this feels great (a reason fans are so popular) because it has a cooling effect on an over-heated person. Heat is lost in the evaporation process. However, this same experience can have serious consequences during cold weather when hunters, fishermen, backpackers and other outdoor people want to retain as much heat as possible.

Through physical exertion the body heat production rises, perspiration begins, and heat is removed from the body by vaporization. Any part of the body touching a cold surface also takes away body heat (conduction), as does breathing cold air which results in the loss of heat from the lungs. So, the wind chill chart is not strictly accurate because it does not take into account all the possibilities of heat loss, or the preventive measures against it.

Thus, the temperature of the air is rarely a reliable indicator of

how cold a person will feel outdoors. Other elements of the weather such as wind speed, relative humidity and sunshine (solar radiation) also exert an influence. The state of health and metabolism of a person, along with the type of clothing worn will also affect how cold one feels.

The early stages of frostbite are a burning or stinging sensation in the affected parts. The skin will be bright pink at first as ice crystals begin to form under the surface. Numbness sets in as the skin turns to pale white, with a hint of grey or yellow spotting.

When actual frostbite occurs, parts of the body begin to freeze. It usually starts with the extremities — nose, ears, fingers and toes — spreading to the cheeks of the face, and on to the hands and feet.

Medical attention is essential! Until help arrives, or the victim can be taken to the nearest treatment center, outdoor companions should give whatever aid they can and keep the affected parts as warm as possible. Fingers are usually frostbit first, and they can be slipped under the arm pits, inside the upper thighs, or in the mouth for warmth. You can also make the temperature rise by flexing fingers and toes. Without assistance — and sometimes even with it — the consequences are gangrene, severe infection and possible amputation.

Few people consider that smoking, drinking, prescription drugs and illegal narcotics present added dangers in wind chill conditions. All of these dull your sensitivity to the circumstances, and have physical effects that will make you more susceptible to frostbite and hypothermia.

Alcohol dilates the capillaries of the skin, increasing the heat loss of the body. Nicotine smoke absorbed by the blood causes the capillaries to constrict, thus restricting the blood flow to the earlobes, fingertips and other areas of the body. Medication can have side effects too, which might mean you shouldn't venture outside during extraordinary weather.

With winter always offering the possibilities of extremely low temperatures, outdoor activists have a responsibility to be aware of the wind chill factor, and what it can mean. When you venture out in winter, dress for both the weather and the wind, wearing loose-fitting, lightweight, warm clothing in several layers, which can be removed to prevent perspiration and subsequent chilling. Snug mittens are better protection than fingered gloves.

Wind chill charts for regular reference are available wherever outdoor equipment is sold. To give you a better regard for just how cold cold can be, look at the figures on the chart.

Now when old Jack Frost comes a-nippin' at your ears and nose, you will be ready to fight back.

And Then There's Hypothermia

by Tom and Joanne O'Toole

Hypothermia kills more outdoor enthusiasts every year than any outdoor activity be it hunting, fishing, hiking or boating.

Hypothermia is the rapid and drastic chilling of the body's core temperature (normally 98.6 degrees F), and begins when the body loses heat faster than it can be replaced. As the body temperature drops because of exposure to cool air and cold water, things begin to happen in a predictable sequence. Left unchecked, it affects one's mental condition and physical reactions, and can result in unconsciousness. The ultimate result is death.

While cold rain or wet snow, combined with a brisk wind, create classic conditions, hypothermia is not exclusive to northern winter weather and bitter cold. When water temperatures are 50 degrees F. or less, and air temperatures as high as 60 to 70 degrees F. hypothermia *is* pos-

sible. Given the right set of circumstances, hypothermia can (and does) occur anywhere.

Skin, surface fat and superficial muscle layers act as insulation for the vital organs — heart, liver, kidneys, lungs and the like. As hypothermia takes over, the internal temperature is dangerously lowered, creating an extremely serious condition. It quickly leads to mental and physical collapse.

There are two types of this debilitating condition — chronic (long onset) and acute (rapid onset). Chronic occurs when one is exposed to a cold environment for an extended time, and usually develops in air temperatures between 30 to 50 degrees F. It is commonly associated with hikers and backpackers, but can creep up on hunters, cross-country skiers and others. Acute hypothermia happens from sudden immersion in cold water, and depending on the water temperature, can develop from within a few minutes to several hours. Boaters, fishermen, skaters, trappers and those at or on water are often affected by this malady.

Moisture is the worst enemy in the fight against hypothermia, and gets its start when victims become wet from their own perspiration, a sudden shower or (more dramatically) from an accidental fall into water.

If you slip into cold water from a boat, it is best to get back in or cling to the craft. Staying as far out of the water as possible maintains more body heat and slows down advanced symptoms. If getting out of the water is impossible, you should be wearing your personal floatation device (PFD) which doubles your chances. You can greatly increase your survival time by assuming the heat escape lessening posture (HELP) or fetal position. To do this, bring your knees up to your chest to protect the trunk of the body, wrap your arms around your legs just below the knees and clasp your hands together.

But since the greatest heat loss is from the head and neck, these areas should be kept as high out of the water as possible.

If there are several people in the water, use the "huddle" method to help each other preserve body heat. Lock your arms around one another and stay side-by-side in a circle.

Swimming to shore can be a deadly decision. The general advice is to stay with a disabled boat. Distances are deceptive, and rescuers can more easily spot a capsized boat than a lone paddler. Swimming burns up body heat, and in 50 degree F. water even the best swimmer could not make a mile.

Because cold water draws heat from an individual indefinitely, any activity saps the body's stored energy. Even treading brings on complications faster. Remaining motionless just about doubles the time a person can endure.

The colder the water and air surrounding a victim, the more sudden and severe the hypothermia. While water will conduct heat away from the body 25 times faster than air of the same temperature, when it is choppy or there are swift currents, along with a blowing wind, the body heat will be pulled away 35 times faster. Water chill is *much* greater than wind chill.

Victims differ greatly in their ability to survive. Large people with ample body fat cool slower than small, thin people. Women cool more rapidly than men and children cool the fastest. Of course, an individual's resistance, and the will to live are all contributing factors.

Any person pulled from cold water or found on land when the classic conditions exist should be presumed to be in trouble. As one's temperature drops, the heart begins to slow, and the victim becomes weak and confused as less oxygen is delivered throughout the body.

Once the affliction begins, many people are unable to counteract the process by themselves. When the blood to the brain is slowed, the mind fails to function correctly. There are many symptoms, but it is usually the other person who recognizes them in someone having the

reactions. Frequently the person experiencing the tell-tale signs becomes too disoriented to realize what is going on.

Ignore a victim's protests that everything is okay. Denial of being cold is common, and a hypothermic may truly believe nothing is wrong. Judgement is impaired, and the victim usually wants to drift off to sleep — but to sleep is to die.

Any of these reactions are probably a signal someone is suffering from hypothermia: difficulty with simple tasks (clumsy actions); dull eyes; listlessness; slurred speech; incoherency; confusion; forgetfulness; fatigue; an inability to control the hands, arms or legs; stumbling; slow breathing; cold, stiff muscles; uncontrollable shivering or trembling; the stomach cold to the touch; apparent exhaustion or dozing off and being hard to arouse.

Advanced stages of hypothermia render a person unconscious, the skin turns bluish-grey, muscles are rigid, breathing is shallow and the pulse is weak. Rewarming the victim is crucial and medical assistance is necessary.

What to do? Too often people try to help, and invariably do the wrong thing for someone who is hypothermic. There are certain "common sense" things you must *not* do: don't massage the arms or legs; don't raise the legs; don't put the person in hot water; don't allow any type of exercise; don't give alcohol or drugs and do not administer hot drinks or hot food.

What you should do is promptly get them out of the elements, cover the head and neck to prevent further body heat loss, remove wet or damp clothing and replace it with dry garments, keep the body warm to maintain the vital organs and handle the person gently. Gentle

handling is extremely important so as to not cause ventricular fibrilation — a condition when the heart quivers but does not pump blood.

Once it is determined a person is becoming hypothermic, it is essential others offer aid to prevent additional body heat loss. Skin-to-skin contact is an excellent way to transfer body heat. A field measure for rewarming is to remove all clothing and place the victim in a sleeping bag or in a blanket with one or two rescuers who have also removed their clothing.

If the victim appears dead, continue trying to restore body heat. Often hypothermics appear lifeless. Yet, vital organs continue to function — but at a much lower rate — and the victim is alive. The medical adage is, "No one is dead until they are warm and dead."

Instead of hoping you will be clear-headed enough to recognize the symptoms, know enough to prevent them. There are a number of things you can do.

When heading outdoors during questionable weather to fish, hunt, hike, camp or just enjoy nature, dress properly. Several layers of loose clothing are best. Because much of the body's heat is lost through the head, a hat, cap or stocking pullover will trap heat and allow your body to send more warm blood to your hands and feet. Most important, stay dry and change clothes if they become damp or wet.

One of the best safeguards against hypothermia is to eat hot meals and drink warm liquids before going out. This provides the nutrition and fuel your body needs to stay warm. In the field do not allow yourself to become dehydrated, and keep nibbling at high-energy snacks to help maintain body heat.

If weather conditions worsen, seek shelter wherever possible and protect yourself from the wet, wind and cold.

The best preventive maintenance against hypothermia is awareness. Everyone should put on rain gear *before* getting wet. For insurance, an extra set of clothing should be with you, in the camper or at least nearby.

The savvy person should be able to recognize in advance the conditions which lead to the problem, and take the necessary precautions to avoid trouble. Outdoor enthusiasts also must be able to spot the warning signs in others in their group.

You don't have to be in the wilds of Hudson Bay, on the Alaskan tundra or in a Montana blizzard to succumb to hypothermia. Given the right circumstances, you can become a victim in the Everglades of Florida, on southwest deserts or in (or out of) a rowboat on a favorite lake.

Hypothermia doesn't just happen to someone else. We all need to know the danger signs.

Tom and Joanne O'Toole are fulltime freelance outdoor journalists and photographers, and their articles appear in newspapers and magazines around the country. During the winter the husband and wife journalists stay bundled up in a little community in northeast Ohio.

Snowshoeing — The Other Winter Sport

Photos by Carl Heilman (unless otherwise indicated)

by Dennis Aprill

On a frigid January morning back in 1948, a small group of cross-country skiers traveling in the Cold River region of the Adirondacks came upon a bearded trapper dressed in traditional mackinaw jacket and pants, carrying a pack basket loaded with traps and wearing wide oval wood and gut snowshoes. After exchanging niceties with the group, the trapper slowly plodded off toward the Santanoni high country leaving one woman in the party, my mother, who had never seen a person wearing snowshoes, to remark, "What an awkward way to travel."

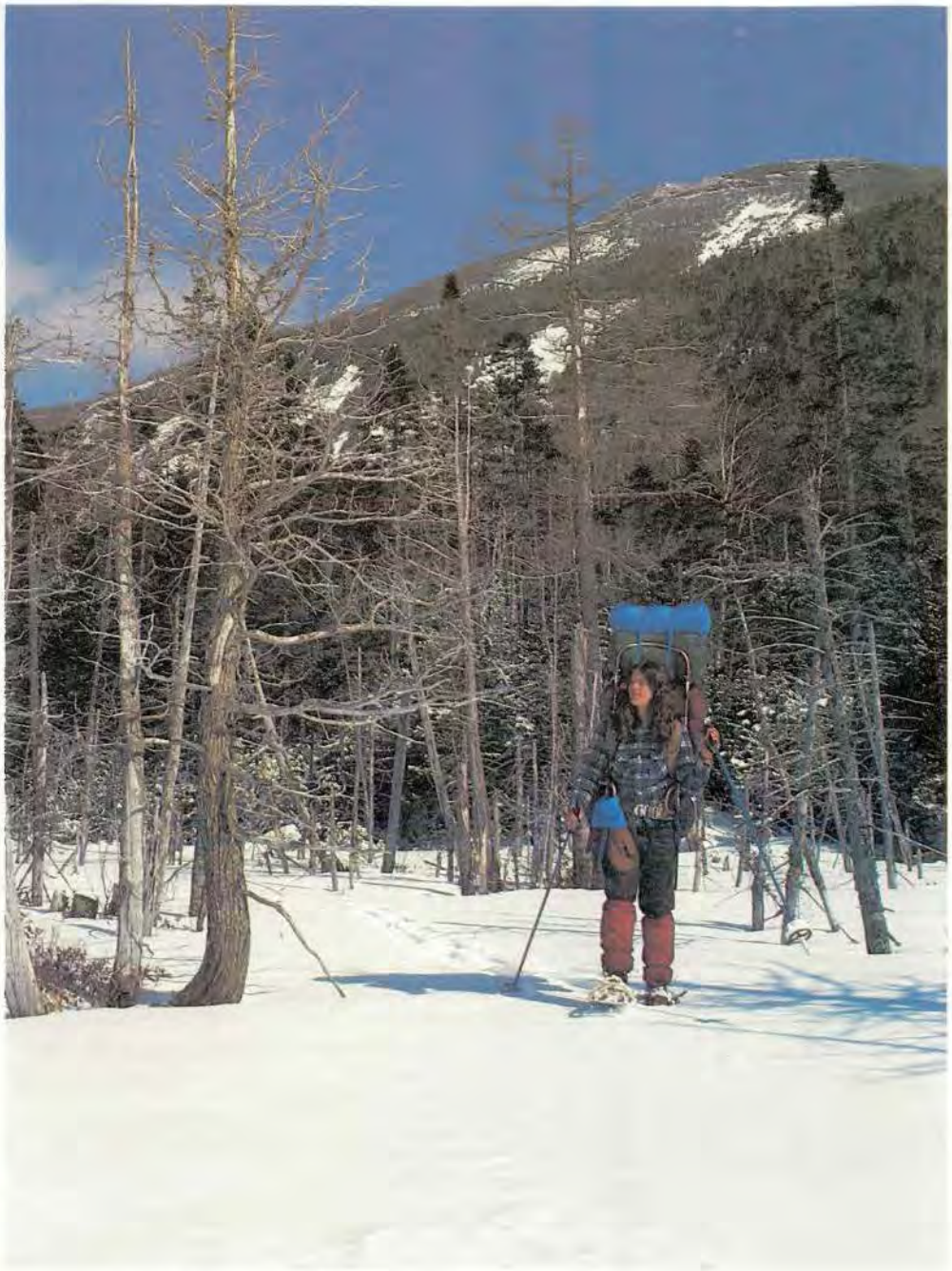
That old trapper has long since crossed the Great Divide, and today few trappers roam the Adirondack high country in winter. However, the odds of seeing a party of snowshoers dressed in spandex athletic outfits wearing state-of-the-art metal and neoprene snowshoes are very favorable in the high peaks region, for many outdoor enthusiasts have come to recognize the recreational and even competitive value of snowshoeing.

Cross-country and downhill skiing once monopolized the

(Above) Looking to the range from Mount Algonquin (facing page) Climbing to the top of Algonquin on snowshoes is a unique experience.

Strapping on bindings

Snowshoes can be fitted for all ages.



With snowshoes winter backbacking does not have to be a tedious task.

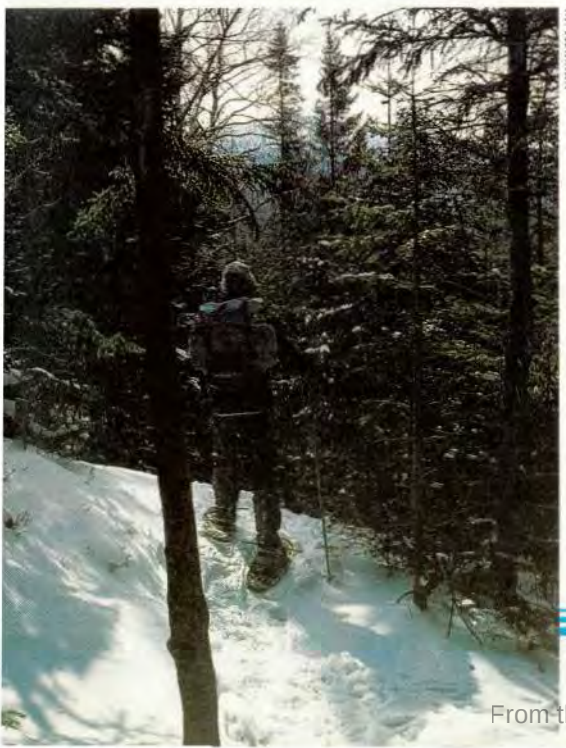
A variety of snowshoes
(Left) Cross-country, (center) Sherpa aluminum, (right) Michigan/Maine

P. April

Toddling along now, but soon he will be an expert.

An afternoon walk

Descending Mount Jo near Heart Lake.



M. Heilman

winter outdoor sports scene, but times are changing. Unlike cross-country skis which perform best on groomed trails, snowshoes can go almost anywhere there is sufficient snow; fallen trees, small brooks and thick underbrush need not form impenetrable barriers because the snowshoer can usually leap, jump or bull his or her way over or through the obstruction. As a result, it is the snowshoer rather than the cross-country skier who is more able to reach the pristine solitude of the far back places.

From an exercise standpoint, snowshoeing once again wins out over cross-country skiing. Snowshoers can't coast down inclines like skiers, so they use more energy and burn more calories walking down slopes. According to Dr. Bob Arnot from CBS's *Morning News*, "just walking with snowshoes is like carrying a 40 pound pack." For these reasons, snowshoeing can be used as an excellent aerobic activity.

Recreational snowshoes or raquettes, as the French Canadians call them, come in all shapes and sizes, but they can be divided into two main categories: the bearpaw and the Maine models. Traditional bearpaws are short, wide oval shoes about 13 x 39 inches, used for deep snow and heavy cover. They can be maneuvered easily because they don't have a tail (long, straight piece at the end), but are very awkward for a beginner because one must walk with legs spread. Narrower modified bearpaws are much easier to use and generally provide good buoyancy; measuring 10 x 36 inches on the average, modified bearpaws can be purchased not only in wood and rawhide, but also with metal frames and neoprene or polyurethane fillings. The longer Maine (or Michigan), cross-country and Alaskan trapper styles with tails track better, and although less maneuverable than the bearpaws, they are superior for use on trails. With an average width of nine to 12 inches (usually nine or 10), the longer models allow the wearer to walk more naturally than with the wider traditional bearpaws, and the tail acts as a stabilizing device, keeping the shoes pointed straight ahead.

Recreational snowshoe bindings vary as much as the shoes they are made to be hitched to. Few snowshoers today use the traditional squaw hitch tied with lampwicking. Although it provides adequate control, it does not allow for a lot of lateral maneuverability. The squaw hitch works best attached to a moccasined foot walking on traditional wood and gut snowshoes. Modern styles of binding abound, and the two most common are the type H and Super A bindings made of neoprene. The Super A provides the most control and is effective for climbing and descending mountains.

The cost for a beginning snowshoe outfit is comparable with the initial cost of a cross-country ski package and ranges from $80 for a pair of wooden bearpaws and basic leather bindings to more than $200 for metal shoes with Super A neoprene bindings.

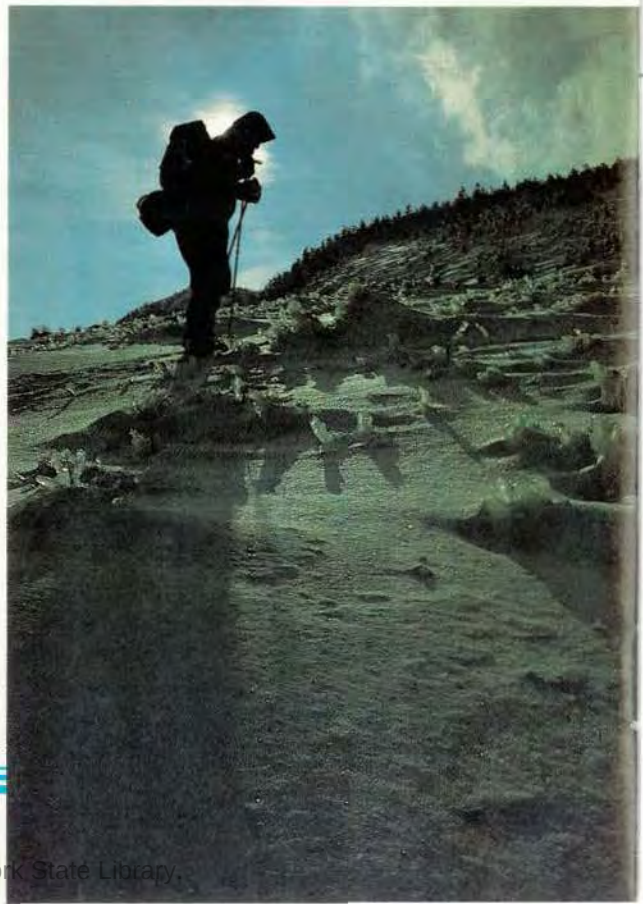
Like cross-country skiers, snowshoe enthusiasts should dress in layers and peel off clothes as their body heat increases. One outfit that works well is an initial layer of polypropoline or Thermax underwear which wicks away perspiration next to the body. Next comes a wool or pile shirt and wool pants. A light Gortex jacket, mittens and cap constitute the outer layer. Medium weight wool

Racing in the 100 meter, Empire State Games

K. April

Rugged going but what a view

On the summit of Rocky Peak Ridge



socks worn in twos or threes covered by boots or pacs complete the outfit. When the snowshoer stops for a rest or a hot meal, he or she should again don the outer clothing layers to prevent getting chilled.

For raquette enthusiasts who are not satisfied with just hiking to remote sections of the state in winter, there is yet another outlet they might want to pursue: competitive snowshoe racing, a growing sport nationwide. One series of races run throughout the winter months is the Empire State Games qualifiers organized by George Bosworth of Corinth. Bosworth, who is president of the United States Snowshoe Association (USSSA), schedules qualifiers on Saturdays with a different location each meet. Such diverse places as Plattsburgh, Watertown, Berne and even New York City have hosted races. The 18 fastest racers in scholastic and open categories for both men and women are invited to compete in the Empire State Games in Lake Placid held the last week in February. To qualify, a racer must compete in two qualifiers and run the 400 meter, 200 meter and 100 meter runs (collectively called the Nordic Sprint) in that order. Racers wear small lightweight metal or wood modified bearpaws and must start from a standing position, hands on hips. Competitors run around a 300 meter, four lane oval course and the racers with best combined times for all three events (not individual race times) are among the 18 chosen for the games. Bosworth also organizes the USSSA's United States Championships usually held at an upstate site like the Lake George Battlefield Park, and most of these competitors come from New York State, even though anyone interested can compete.

In late January, snowshoe racing action switches further north to Gabriels, the home of the North American Showshoe Classic. Organized and run by Jim Tucker, director of the Paul Smiths Striders, the Classic offers more opportunities than USSSA races. For one, it brings together leading snowshoe racers from New England, Eastern Canada as well as New York. Also, the Classic's rules are less rigid than the Empire qualifiers. Racers can choose the events they wish to compete in from the usual 100, 200 and 400 meter sprints to the 1500 meter race-walk or the 10 kilometer cross-country run. Besides scholastic and open, there is also a masters category for men and women 35 years and older. Classic snowshoers can wear any kind of shoe or binding and choose whatever starting position they wish.

In most years, the North American Classic attracts quite a conglomeration of contestants and just viewing the spectacle is worth the trip to the Paul Smiths Sports Annex. Here, spectators and participants will see French Canadian teams dressed in brightly colored jackets and toques, New Englanders wearing small wooden racing shoes with lampwick bindings, mingling in with New Yorkers wearing sneakers attached to neoprene and metal shoes with crampon bindings. This cultural mix and friendly regional competition comes to an exciting peak at the awards ceremony when patriotic songs, loud applause and general hoopla greet every announced winner. Like the USSSA races, sprints as well as the race-walks are held on a 300 meter oval track; the 10 K races are run on a groomed cross-country course.

Standard mass produced snowshoes for these recreational and competitive snowshoeing activities can be purchased from most mail order companies specializing in outdoor gear. However, individuals who want a snowshoe that is not only functional, but also reaches the level of an art form may want to spend a few extra dollars and purchase a pair of handmade shoes. Like the handcrafted Adirondack guideboat and pack basket, handmade snowshoes require an artisan to go through a tedious process in their creation. One such craftsman is Carl Heilman of Brant Lake who makes his snowshoes from start to finish using the traditional process. He first selects the tree (usually white ash), then splits and hews the wooden strips. Next, he steams and bends the wood and finally laces the shoes. The only part not handmade by Heilman is the optional babiche filler; he prefers using neoprene or urethane instead for their durability and strength. His finished shoes come in a variety of shapes and sizes from the full size 11 x 63" Ojibwas to the mini 5½ x 20" kitty paws for children weighing under 40 pounds.

Even though snowshoes have been in existence for thousands of years and have been traditionally a practical means of navigating deep snow conditions, they no longer are the awkward heavy webs worn by Adirondack high country trappers like the old fellow my mother met up with 40 years ago, but rather have evolved into svelte, lightweight equipment perfect for winter recreation and competition.

Dennis Aprill is a free-lance writer who lives in Schuyler Falls. He has written articles for numerous regional and national magazines including THE CONSERVATIONIST. He is an enthusiastic snowshoer and in 1989 was the 200 meter World Cup of Snowshoe Racing champion.

The Opossum —

North America's Australian Connection

by John B. Tenney, Jr.

P. Schmidt

A close-up of America's only marsupial

An opossum hath an head like a Swine and a tail like a rat, and is the bignesse of a Cat. Under her belly she hath a bagge, wherein she lodgeth, carrieth and sucketh her young.

Captain John Smith
Travels and Observations in Virginia, 1606-1612.

One snowy spring morning while traveling the back roads of New York in the company of a Japanese gentleman, our car passed a road-killed opossum. My companion got a good look at the dead animal. "What was that?" he asked. "It looked like a big rat!"

My friend listened intently to my description of the opossum. He was surprised to learn that the dead animal was a marsupial mammal, that it carried its young in a pouch like a kangaroo; and that after emerging from the pouch, the young, perhaps six to nine survivors in a litter, would ride on their mother's back until they were grown.

My friend looked puzzled. He knew about marsupials, but he associated them with Australia. From the expression on his face it was clear that he couldn't relate the rat-like creature with the personable "roo," cuddly wallaby, or lovable koala. Why tell him that on bitter winter evenings a

woebegone opossum occasionally snuffles around my garbage cans? But for one brief instant a question formed; Can an opossum be found in a Japanese zoo?

Its unlikely that anyone will make stuffed toys to resemble an opossum, but this varmint is interesting out of proportion to its appearance. What the opossum lacks in beauty, personality and intelligence, it makes up for with its unusual physiology and curious family history. North America's only marsupial mammal is a living fossil whose anatomy has remained virtually unchanged from the Upper Cretaceous Period, 70 to 90 million years ago. It once shared the same habitat as dinosaurs and pterodactyls.

D. Spaar

A baby opossum
A litter of 25 is not uncommon.

Fossil remains suggest that the opossum's ancestors arrived long ago when placental mammals, including large carnivores, were common in many parts of the world. Ancestors of the opossums may date back to an age when Australia, Antarctica and South America were joined in a hypothetical super-continent known as Gondwana. About 45 million years B.P. (before present) Australia and Antarctica are believed to have separated from the South American land mass. At this stage, marsupial mammals were established in Australia, and in North and South America. Evidence suggests that the earliest "didelphids," marsupials whose ancestors resembled the opossum, became extinct in North America 10 or 20 million years ago. In general, marsupial mammals gave way to placental mammals, but relatives of the opossum proved to be hardy. The species thrived and differentiated in South America which, for a time, was isolated from the North American continent by water. As the water level receded, (about two to five million years B.P.,) the Central American land bridge was exposed and the opossum began to shuffle slowly northward. Other marsupial species remained behind in South and Central America. Today, 75 species and 11 genera of marsupials are found there. Only the adaptable Virginia opossum has made the journey into North America. Its reproductive rate and adaptability have insured its success. The opossum is well-made to survive as a species. Its tiny newborn, about one-half inch long, require a gestation period of only 13 days. At birth they are little more than embryos changing position from uterus to pouch. As young emerge from the birth canal, they "swim" hand-over-hand up belly fur to enter the pouch containing teats of the milk glands. Audubon noted that the opossum's nipples are thin and attenuated, "no larger than a pencil lead." Some observers report that nipples swell inside the babies' mouths and they are unable to let go. Ridges and ripples in the infant mouth helps keep them locked in place to continue feeding. There they remain for more than three months before emerging to begin their piggy-back phase.

Large litters, up to 25, are common and some as large as 56 have been reported. Since the female usually has only 13 nipples, all the litter will not survive. If only a single individual survives from a litter the female may receive insufficient stimulation to continue lactation and the newborn will be abandoned to die. Typically, opossums breed twice each year with litters appearing in February and June. Males lack pouches, but they make up for it with a bifurcated (forked) penis which accommo-

P. Schmidt

A litter of young 'possums

dates the female's paired, lateral vaginal canals. The possum's scientific name describes its unusual sexual configuration; *Didelphis* (two-wombed) *marsupialis* (having a pouch.)

In past years, one popular misconception held that the opossum copulated through its nose and gave birth by sneezing young into its pouch. As outrageous as this idea seems today, it was probably reinforced by the shape of the male's penis and by repeated observations of females licking the pouch to clean it prior to giving birth.

The opossum has more teeth (50) than any North American land mammal. This dentition enables it to chew bones and tear skin easily. Its prehensile tail enables it to hang from trees. The fifth toe of the hind feet is clawless and opposed, capable of grasping, thumb-like motions resembling a monkey's paw. When John James Audubon depicted the opossum for "Mammals of North America," he drew a pair of animals in a persimmon tree and he carefully depicted the opposed thumb of the hind foot. This capability helps climbing and makes opossum tracks easy to recognize. Although they are classed as arboreal animals, opossums often take over or share the burrows of other species. In the deep South they sometimes bunk up with the scruffy armadillo.

To first Europeans in the New World, marsupials were a curiosity. One of Columbus' lieutenants, Vincente Yañez Pinzón carried the first marsupial (a female southern opossum, cousin to the Virginia opossum) back to Europe from Brazil where it was greeted with astonishment. He also carried back the local Indian name, *zarigüeya*, by which the oppossum is still known in Latin America. In North America, East Coast Indians named the opossum and their name was adopted by English-speaking settlers. In the Powhatan dialect of Virginia, *aposoum* means white animal.

Native Americans used long hair from the opossum's belly for braiding cords used with clothing and ornamentation The coarse hair was easily dyed. Opossum hair and buffalo hair, traded from the west, were preferred materials for weaving light belts, straps and other articles of apparel. This usage was observed among women of tribes from Virginia to Louisiana. John Lawson noted, *Their Fur is not esteem'd nor used, save that the Indians spin it into Girdles and Garters.*

Few early descriptions of the opossum are more interesting than that written by John Lawson, Gentleman Surveyor-General of North Carolina in *A New Voyage to Carolina,* (London, 1709.) Like many early writers, Lawson was fascinated by the opossum's capacity to survive.

If a Cat has nine Lives, this Creature surely has nineteen; for if you break every Bone in their Skin, and mash their Skull, leaving them for Dead, you may come an hour after, and they will be gone quite away, or perhaps you meet them creeping away. They are a very stupid Creature, utterly neglecting their Safety. They are most like Rats of any thing. I have, for necessity in the Wilderness, eaten of them. Their flesh is very white, and well tasted; but their ugly Tails put me out of Conceit with that Fare.

Lawson was not alone in wondering at the opossum's ability to absorb punishment and survive. In *Mammals of North America,* naturalist Victor Cahalane reported on 95 'possum skeletons found in Kansas. Thirty-five showed evidence of severely broken bones which had healed. One animal had survived after two broken shoulders, 11 broken ribs, and a damaged spine. Cahalane concluded that many of these injuries would have been fatal to other species.

When threatened or cornered, the opossum feigns death convincingly. Normally, it sleeps with eyes and mouth closed and feet tucked out of sight, hut when "playing 'possum" it collapses on its side with eyes and mouth open. Tests conducted during this state indicate that the animal is awake since it responds to loud noises by twitching its ears and since there are no changes in oxygen consumption, body temperature, or blood chemistry. EEG recordings of brain wave patterns are identical for this state and for a normal, alert animal. These findings lead some investigators to conclude that a condition of self-induced paralysis has evolved to reduce attacks by aggressors and to facilitate opportunities for escape. An injured or threatened 'possum will remain motionless for long periods of time; then blithely saunter off after danger has passed.

Over the years, observers have

been fascinated by this aspect of opossum behavior. In *'Possum Hunting in Alabama*, Englishman Phillip Henry Gosse, (*Letters from Alabama*, London, 1859) tells how he learned to distinguish between a dead possum and one that feigns death. *The initiated... can tell a real dead 'Possum from one that is shamming and the overseer directed my attention to the last joints of the tail. This, during life, is prehensile, used to catch and hold the twigs like a fifth hand; and even in this hypocritical state in which I saw it, the coil of the tail-tip was maintained whereas in absolute death this would be relaxed permanently."* When Gosse referred to the opossum as a "critter" he was admonished by his guide. *"The overseer promptly corrected my mistake. 'A 'Possum, Sir, is not a critter, but a varmint."*

This varmint can play dead and it can also play dumb. Although it may use saliva to mark territory, its tendency to drool helps contribute to its bad reputation. Estimates of the cagey 'possum's intelligence vary, from unintelligent to very stupid. Predators include owls, foxes, bobcats and humans. The opossum loses a large fraction of its population to motor vehicles. Nevertheless, it survives in a wide range of environments. Its feeding habits adapt to whatever is available. Foods include fruit, vegetables, nuts, meat, eggs, carrion, small animals and insects. Persimmons are a favored fruit. In parts of the south, persimmon trees are called possumwood.

Audubon's Journals recorded the opossum's omnivorous feeding preferences and noted its fondness for eggs. *The mating calls of the Wild Turkey Cock delight the ear of the cunning creature, for it well knows that it will soon hear the female and trace her to her nest, when it will suck the eggs with delight.*

Indians ate the easily caught opossum but it may not have been a favored dish. Among the Lenape Indians of Pennsylvania, New Jersey and southeastern New York, it was customary to placate the spirits of game animals at the First Fruits ceremony held in the fall. While the white-tailed deer was accorded special honors, dances were also performed for the bear, otter and opossum. Performance of the opossum dance was reserved for the women.

Many people, like Lawson, are put off by the opossum's rat-like appearance. It is not in demand as a game animal; nevertheless, some people find it palatable. Even Lawson, who ate them *for necessity in the Wilderness*, admitted they didn't taste too bad. In a cold South Carolina campsite he recorded, *We made our selves as merry as we could, having kill'd 3 Teal and a Possum; which Medly all together made a curious Ragoo.* On another occasion he noted, *At Night we kill'd a Possum, being cloy'd with Turkeys, made a dish of that, which tasted much between young pork and Veal; their Fat being as white as any I ever saw.*

Wild food expert Euell Gibbons advises hunting 'possum between autumn frost and winter freeze. 'Possum and raccoon are cooked using the same recipes but the meat has different flavors. In cleaning 'possum, care should be taken to remove four pearshaped glands, two in the small of the back and one under each foreleg. These glands are similar in 'possum, woodchuck, porcupine and raccoon. Cleaned carcasses should be covered and soaked for at least 24 hours in cold water containing 1/2 cup vinegar and 1/4 cup salt. Gibbons recommends saving the liver for inclusion in stuffing. His recipe contains Jerusalem artichokes, wild apples, maple syrup, hickory nuts and chopped 'possum liver.

During hard times 'Possum and 'taters has been eaten in many parts of the eastern U.S. One cookbook, *More than Moonshine, Appalachian Recipes and Recollections*, by Sidney Saylor Farr (University of Pittsburgh Press, 1983) concludes a recipe for baked 'possum with this authentic touch. *To add flavor, slip a sprig or two of sassafras root down into the stuffing between the stitches after you have sewed the 'possum up. Serve the 'possum with baked sweet potatoes and green vegetables along with corn bread and coffee or milk.*

In the 1890's the opossum was introduced to the West Coast where it has extended its range from the Mexican border to Canada. Chances are good it is there to stay, but its slovenly habits and surly temper don't make it a particularly welcome guest.

Shuffling gait, drooling grin, frost-bitten tail, ragged ears and a bad smell characterize the opossum. Like Rodney Dangerfield it doesn't get much respect. God may like the opossum as it is however. Evolution seems to have bypassed these mammals. A million years from now, when our descendents resemble beings from an episode of Star Trek, the sly 'possum, looking much the same, may still be plodding along, sniffing at futuristic garbage cans.

John B. Tenney, Jr., a native of Williamson, is an engineer who works for Xerox in Webster near Rochester. He is also a free lance writer and naturalist. He is a regular contributor to *Finger Lakes Magazine*, writes a column for the *Williamson Sun* and is currently working on a book of native American place names.

"Whispering Wings" *Watercolor*

Morten Solberg

A Wildlife Abstractionist

by Wayne Trimm

Morten Solberg is an artist with a productive past and a promising future.

After years of training in realistic painting at the Cleveland Institute of art, he pursued a career in commercial art including working as an art director. Then one day he attended an art show at the Pittsburgh International Art Exhibition where he was introduced to abstract art. The abstract work of Franz Kline and also the paintings of Andrew Wyeth made a strong impression on young Solberg and his own art began to change.

Morten Solberg had often incorporated wildlife subjects in his painting handled in a rather traditional way. Now he started to combine tight realistic handling of wildlife within a matrix of abstract design. His work is sought by collectors and galleries such as the national Gallery of Art in Washington, D. C. and the Cleveland Museum of Art.

Although we are focusing on the wildlife art, Morten Solberg reflects a wide interest in nature and the environment in his paintings. He works mostly in water based media such as transparent watercolor, gouache and acrylics but is now doing more oils than before. His interests besides wildlife include the history and culture of the American Indians, sportfishing, flowers and the female form.

His studio is in California where he lives with his family of a wife, three daughters and three sons. He claims that all of his daughters and one son have an active interest in art, two of them professionally.

Like many wildlife artists, he lives in the country with deer, fox, quail and other wildlife around all the time.

Morten Solberg's talent is recognized by professional art organizations of which he is a member including the National Watercolor Society, the American Watercolor Society and the Society of Animal Artists. He started to concentrate on wildlife abstract subjects about 1978 and his fame has increased rapidly in the field ever since. His work is strong both in subject matter and design. We like his work and want to share it with you. Prints of his work are available from Mill Pond Press in Venice, Florida.

"Deceptive Calm — Goshawk" Watercolor

"Edge of the Night — Barn owl" *Watercolor*

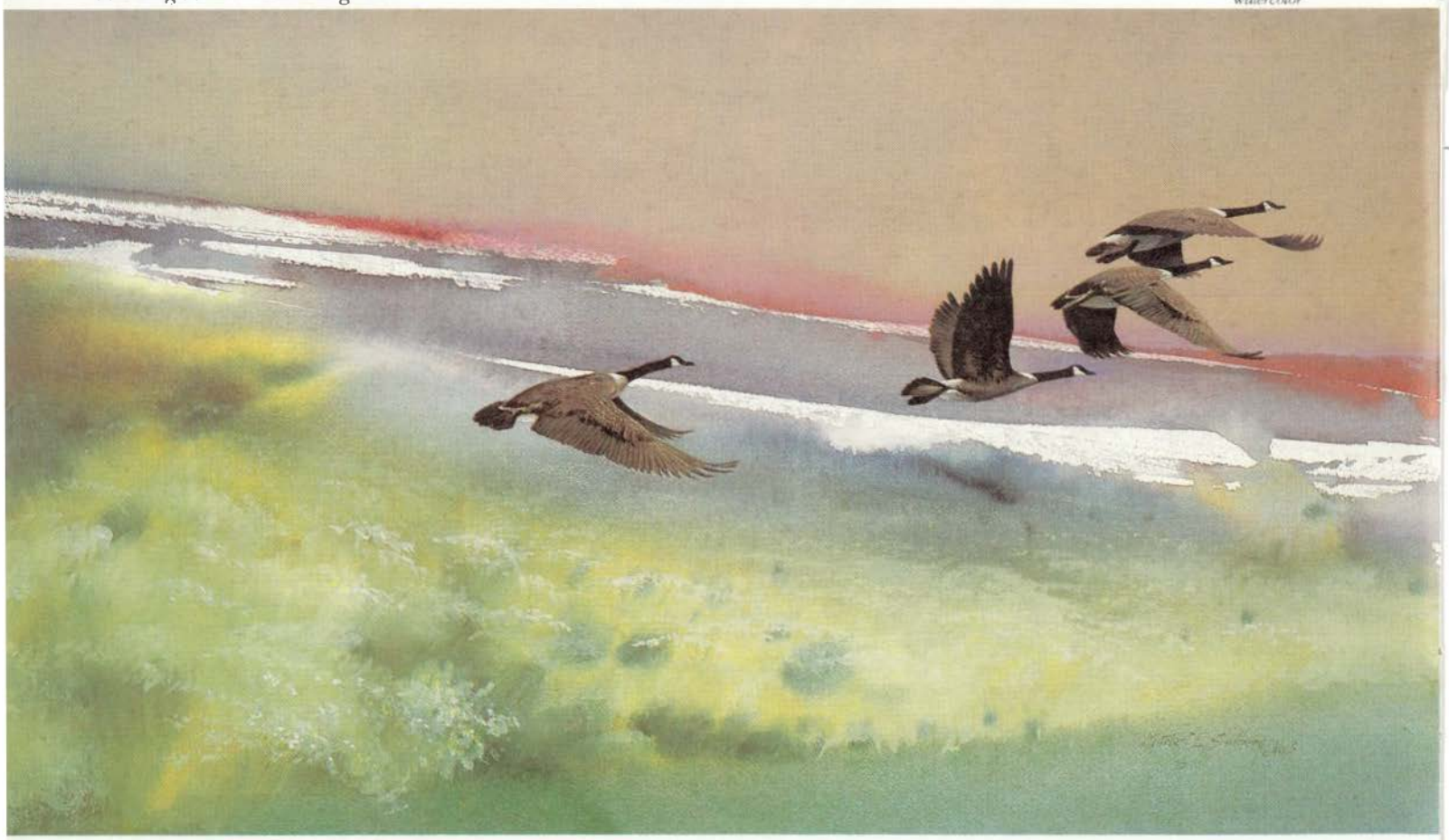
"The Long Cast" *Acrylic*

"Something Moved — Bobcat" — *Acrylic*

Black-capped chickadee — *Watercolor*

"Handsome Hunter — American kestrel" Watercolor

"Morning Mist — Canada geese" Watercolor



"Monarch of the Sky — Golden eagle" Watercolor

The backyard
The lawn area has been reduced to a comfortable minimum.

Going Native In New York

Photos by author

Designing and planning a wildlife garden is not only soul satisfying but a sure cure for those winter blues.

by Karen Jescavage-Bernard

When we moved to suburban Long Island we never planned to plant a habitat for wildlife. We wanted vegetables and flowers, and, of course, a perfect green lawn. But we were in for a rude awakening: under the thin layer of topsoil left by the builder, our soil was glacial till, the sandy, rocky rubble deposited when the last Ice Age glacier left Long Island. Our lot faced southwest and was completely exposed to the sun and wind. The only shade came from a mulberry tree planted in the backyard. Our landscaping budget did not allow for tons of topsoil, soil amendments or a costly irrigation system. And our work schedules left us short of the many hours needed to do the work. Where would we find the time and money to make a garden?

Near our property there was still a large undeveloped parcel where native trees, shrubs and flowers flourished without benefit of fertilizer, water or pesticides. It dawned on me that a garden planted with these independent natives could make an attractive landscape with only a minimal investment in time and materials. In fact, the only soil improvements we made were to dig up the planting beds and rake out bucketfuls of stones. To avoid any possible objections the neighbors might have toward a "wild" garden, I designed a landscape of formal beds bursting with lush plantings of wildflowers. All paths were surfaced with wood chips (which came free of charge from a tree service company glad to save on trips to the town dump and the tip fees) and edged with tidy borders of wild strawberries.

Meanwhile I began reading everything available on native plants at the local library and taking courses in wildflower identification and plant propagation at a nearby botanical garden. Finally I was ready to plant the seeds and cuttings I had collected. By the end of its first year, my wildflower garden was so successful that I was able to supply seeds to specialty nurseries and plant societies.

One project completed that

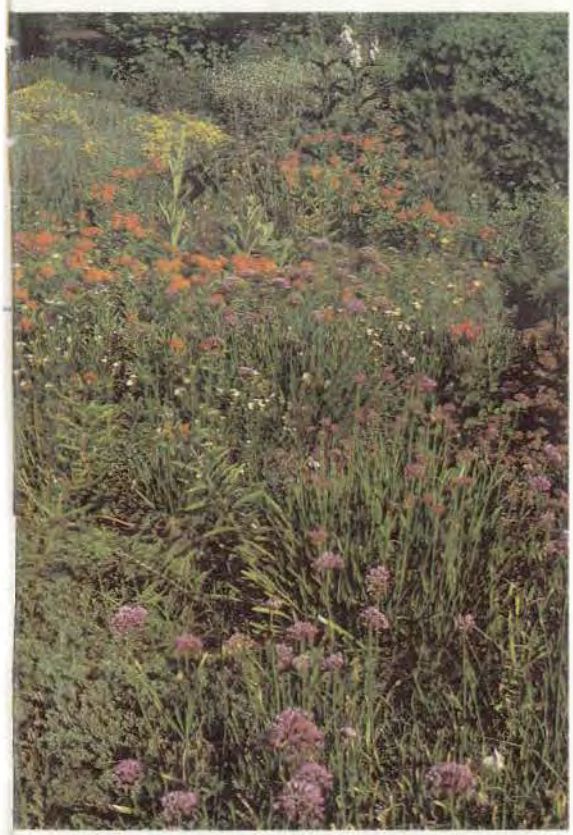
Wild birds love these cherries as much as we do.

The wildlife garden in spring
Young fruit trees on the property will be pollinated by insects attracted to these plantings of daisies and flax (left) and iris and chives (right).

This mulberry tree produces thousands of berries for the birds and hundreds of seedlings for the gardener.

The wildlife garden in autumn
Fall borders of asters, goldenrod, wild ageratum and lowbush blueberry extend the garden year and supply abundant food to migrating butterflies.

Seeds from this sunflower attract a wide variety of birds.



This planting of butterfly weed, goldenrod and chives requires minimum maintenance.

year paid unexpected dividends. To reduce the uncomfortable thermal effects of summer sun and winter winds on the exposed front of the house we added hollies, evergreen *Euonymus* and trellised firethorns to an existing planting of rhododendrons, bayberry bushes and red cedars. We also planted a green ash and a hawthorn for summer shade and installed a low-maintenance groundcover of vinca and spring bulbs. This combination of berry-bearing trees and shrubs turned out to be an irresistible attraction for the local birds. Where once we had been thrilled by the sight of a single bluejay, we counted as many as nine species of birds every day that winter. Over the next two years, our census rose to 19 species. As the trees matured we also witnessed a decline in the numbers of pest birds like starlings and English sparrows.

The unplanned success of this winter garden, combined with the news that the wild area nearby was slated for development, inspired us to enlarge our wildlife garden. I pulled out all the stops and transplanted whole trees and shrubs before the backhoes arrived. Of the sassafras and mulberry trees, lowbush blueberry and barberry bushes and wildflowers and ferns that I collected, everything survived the move except the sassafras. At the end of the year, the garden contained more than 40 species of native plants and was certified as an official Backyard Habitat by the National Wildlife Federation.

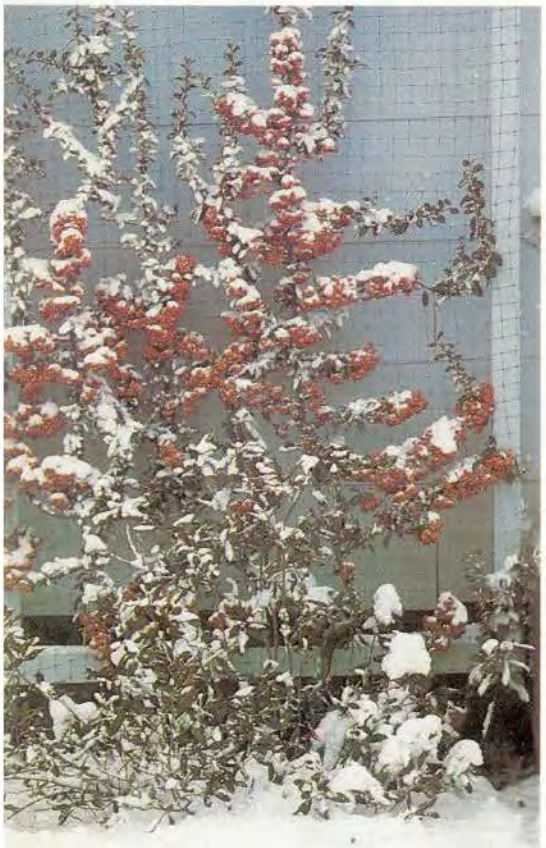
By limiting the garden area, we were able to improve enough soil with a cover crop of mixed rye, buckwheat and white clover to make a vegetable garden and mini-orchard. Choosing dwarf and semi-dwarf trees, we found room for 11 fruit trees (including apples, plums, pie cherries, plus a quince and a fig tree) as well as black and red currant, gooseberry, elderberry and hazelnut shrubs. I counted all the birds as two people and planted accordingly. This rule of thumb turned out to be a reasonably accurate gauge of how much fruit is enough for "us" and for "them" - although "our" cherries do have to be protected with netting as they ripen.

Designing a Wildlife Garden

Birds, animals and insects all share the same basic requirements: food, water, shelter and a secure place to raise their young. Ideally, a wildlife garden will produce fruits, nuts, cones, catkins and seeds for most of the year. But a suburban gardener should still plan to include a supplementary feeding program in winter and early spring. If a small pond or other water feature in not feasible, then a year-round supply of drinking water must be available. Even a heated birdbath can be a lifesaver when surface water is frozen over. Adding evergreen trees and shrubs to the garden will provide nest sites and protection from predators and winter weather.

The best advice for the beginning wildlife gardener is: "Don't just do something, stand there." Look around at vacant or abandoned land to see what plants grow there without care or attention. Observe *how* plants grow in the wild before introducing them into the garden. Many species can be undesirable in the garden. They may be disease or insect prone like wild plums, cherries or willows. They may be invasive like honeysuckle or bittersweet. They may languish where the site is too sunny or dry like dogwoods and birches.

The design should include a basic site analysis to determine



(Above) In June the white flowers of these firethorns are covered with beneficial insects in search of nectar.
(Below) In winter the same plant provides critical food and shelter for wildlife.

Wild strawberries produce edible fruit from June through October and make a tidy border besides.

Although berry-bearing evergreens like this holly provide food for wildlife, gardeners should supply supplementary food and water in the cold of winter.

how much sun, shade and rainfall your garden gets. You should also know your soil type and how well (or poorly) it drains. If the soil has been compacted by construction machinery you may want to invest a season in improving it with a cover crop. But the path of least resistance is to work with the site and select plants that will thrive under existing conditions. Many native plants prefer poor soil and will actually die out if the soil is "improved" to garden standards.

Which Wildlife Do You Want?

A lot like our suburban fifth acre will support many species of birds but it is too small for most small mammals. It has a sunny area suitable for butterfly habitat and with the addition of a water feature a small bog garden for turtles and amphibians would also be possible.

A Meadow In A Can?

Contrary to popular advertising, making a wildlife garden is not as easy as shaking salt on the ground. Since native plants are not always easy to find at local nurseries, seeds must be started either indoors or in an outdoor cold frame, not by direct sowing (as I discovered the hard way). All small plants must be mulched, watered and weeded until they become established in the garden. Once established, however, a native plant garden comes as close as possible to the ideal of no maintenance. There is no mowing, no watering, no fertilizing, no dead-heading, no time-consuming trimming. Pruning is limited to removing dead or broken branches. Since wildlife food plants should never be sprayed, the garden should contain plants to attract and support beneficial insects as well as insectivorous birds.

Whose Garden Is This Anyhow?

A wildlife garden makes us reexamine our whole philosophy of gardening, starting with the value we place on a perfect lawn. From the point of view of both wildlife and the wildlife gardener, lawn is a negative landscape feature. It doesn't provide food or shelter for animals or birds, plus many native plants can't successfully compete with it. Worse still, it uses up scarce time and requires expensive and polluting chemicals to maintain. Since our own need for lawn could be satisfied by 900 square feet of grass for lounging, picnicking and playing games, we reduced the lawn area in the backyard and eliminated the front lawn entirely. We used mulch paths and low maintenance groundcovers instead.

Whether a plant provides food or shelter and how hardy and pest-free it is became more important than the size and color of its flowers: we replaced tender tea roses with hardy, hip-producing climbers and shrub roses which don't need to be sprayed. No plant gets into the garden just on its looks. New plants are assessed for their multiple uses and their three (or even four) season performance. An ideal wildlife garden combines tall, dense evergreen trees and hedges with a variety of food-bearing trees, shrubs, flowers and groundcovers. But even a small garden has room for a clump of tall ornamental grass and some trellised vines both of which can provide shelter and food.

In the years since this garden was planted, public enthusiasm for native plants in the home landscape has mushroomed. Almost 9,000 Americans have registered their properties as official Backyard Habitats. Some gardeners "go wild" because they are interested in the environmental benefits to our threatened species of animals, birds and plants. Others are attracted by the economic savings in time, labor and money that can be realized from this type of landscape. Still others are forced to use native plants by increasingly stringent legal restrictions on water, pesticide and fertilizer use. But everyone shares the joy, beauty, color and life that wildflowers and wild birds bring to a garden. A wildlife garden is never really finished, but at every stage it gives us many hours of pleasure and satisfaction.

Karen Jescavage-Bernard designs ecologically sound gardens and writes about them in *National Gardening Association, Mother Earth News, Gardening America, The Hardy Plant and Growing From Seed.* She credits her backyard habitat for opening a career of garden designer, lecturer, international seed collector and creating a force for ecological change in planning and planting landscapes.

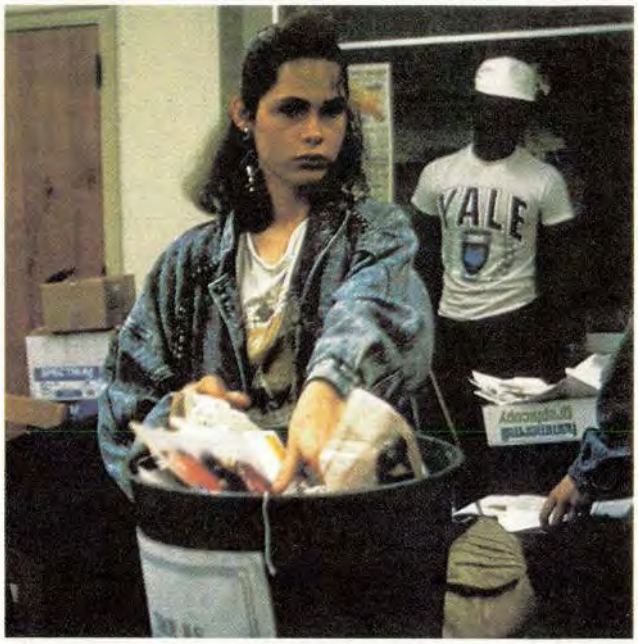
To Find Out More

The National Wildlife Federation (1412 16th Street NW, Washington D.C. 20036-2266) will mail you free information about the Backyard Habitat on request. The packet contains a brochure explaining the program, a list of suggested reading material, some tips on planning and planting a wildlife habitat and an application for registration in the program. Additional instructional materials, including "Gardening With Wildlife" and a Wildlife Landscape Designer kit, are available for a fee.

Cornell Cooperative Extension Services can provide information about appropriate plants for your area and sources where they may be available.

Living Responsibly With Solid Waste

by Dennis W. Cheek



NYSTEP photo

Whose mess is this anyway?

The middle school students enter a littered classroom that looks for all the world like the remains of a party that got out of hand. Cups, newspapers, notebook paper, hairspray bottles, soda cans, ribbons, plastic bags, small pieces of wood, metal shavings, used computer paper and other items litter every chair and corner.

"Who trashed this room?"

"Looks like my bedroom, but it's not dirty enough."

"Bet we have to pick it up."

"Don't touch anything — it might be here for a purpose. I think we have to do something with this."

"Clean it up! We'll need rubber gloves."

"I'm not picking it up! It's not my mess."

This scenario has been modeled after suggestions in a new field test "module" *Living Responsibly With Solid Waste* formulated by the New York Science, Technology and Society Education Project (NYSTEP). Some students clear a space and sit down in their assigned seats. Others mill aimlessly about the room, unsure of what to do. Three students gingerly pick up some items and place them in trash cans.

"What are we going to do about this mess?" Jeffery asks. He suggests placing it all in trash cans. "I don't think that's very good," says Lisa. "We separate trash in my home. You know bottles, cans, newspaper, stuff like that." Jose tells about how they recycled many classroom items within his sixth grade classroom last year. Eventually, everyone reaches a consensus and both teacher and students begin separating paper, plastics, wood products, aluminum into separate piles.

Small teams of students go through each group of similar materials and brainstorm ways that items can be reused. Ms. Jones calls a temporary halt to explore initial reactions and feelings.

"Disgusting," says Alisha, "and since it wasn't my doing, I didn't want any part of cleaning it up. That's why I cleared my chair and sat down."

"Me, I don't produce any garbage," says Tim.

"What do you think, class?," asks Ms. Jones, "do we have a solid waste problem here?"

"Judging from the looks of this room, I think we do" says Ken. "After all, this is our trash. It didn't come into our school from somewhere else. We made it by ourselves — and this is probably only part of what we make in one day in this school."

Bill continues, "How much trash do we really make in this school in one day?"

"How could you go about finding out?," Ms. Jones asks.

Students discuss ways they might attack the problem. Someone suggests a systematic schoolwide monitoring program. But Ms. Jones questions "How can we make other students care about

this problem, if we find out it's a big one? We can't change things by ourselves. I want you to think about what we want to work on during our time spent studying about the issue of solid waste."

"You mean how can we throw away less and make better use of what we have?," questions Jiminez. A number of other possibilities are put forward by various students as a student volunteer writes them down.

Ms. Jones calls a halt to the process. "We'll start looking at these questions tomorrow. Meanwhile, I need your help to set this room up like you found it so the next class can experience what you did." Students enthusiastically scatter trash across the room. The bell sends these students off to their next class and heralds the arrival of their peers.

Throughout the day, Ms. Jones repeats this activity with her seventh grade science classes. And on the following day, she helps organize small groups to generate lists of questions that address new information needed to understand or take action on problems raised the previous day.

Subsequent activities over the next four to eight weeks take students through six units. The first unit gives students a grasp of the dimensions of the solid waste problem in America and its personal relevance. Students actively investigate the amount of solid waste generated in their home, their school and their community.

Unit two focuses on waste reduction. Students investigate natural and artificial packaging. Waste basket analyses of trash generated within various parts of the school building lead students to develop an action plan to reduce school waste.

Recycling and reuse is the topic of unit three. Students construct a solar desalinizer. Each student designs and monitors mini-compost piles, and the whole class manufactures recycled paper.

Students study the 1983 New York Returnable Container Act in terms of their home environment, and plan and implement a school wide recycling program.

Strategies to convert waste to energy are the focus of unit four. Students burn pieces of food and measure the amount of energy produced. The fifth unit considers the ultimate destination of all solid waste not dealt with in any of the previous ways — the landfill. It includes brainstorming possibilities such as "mining" landfills in the not too distant future. In the course of study, students investigate different types of soils and their suitability for containment of solid waste.

The final unit involves students in exploration and evaluation of existing long-range community plans for solid waste management. Students are encouraged to improve existing local plans based on their own newly discovered research and knowledge of solid waste management. They present the results of their deliberations

Producing paper from pulp gives students some insight into the blessings and problems of recycling.

NYSTEP photo

to the local governmental agency charged with solid waste management policy.

As students progress through the module, they acquire solid scientific concepts such as biodegradability, leachate, topography, rates of change, properties of matter, decomposition, natural cycles, energy consumption, natural systems and economies of scale. The module emphasizes the acquisition and fine-tuning of science process skills — collecting and analyzing data, generating and testing a hypothesis and quantifying observations. Additionally, the module focuses on the promotion of positive attitudes toward and about science.

What positive impact does this solid waste module generate? Ninth graders at Clarkstown South High School in West Nyack found that the module empowered them to take local action regarding solid waste problems. As a result of a trip to the local landfill, and a meeting with the town conservation officer, these students sensitized the town to additional recycling possibilities. Their action led to a townwide "detinning" project of metal cans. Within their school, these students began a source separation project in the school cafeteria that was so successful that the school is already committed to continuance of the project, and its success has spilled over into a neighboring school. Similar happenings occurred throughout the state.

Carolyn Graham, the project director of NYSTEP and an associate in the bureau of science education within the New York State Education Department, is enthusiastic about the potential of these optional, supplemental modules to the new middle level science syllabus under development. "The planned set of 12 modules within the NYSTEP project," Ms. Graham explains, "is designed to engage students in critical thinking, problem solving, decision making and action taking about pressing science, technology and society (STS) issues. There is good evidence both from research and practicing science teachers, that hands-on, minds-on science investigation using issues of local importance can result in higher interest and greater achievement on the part of adolescents in schools. These materials are designed with that focus in mind."

Teachers have responded enthusiastically. One teacher wrote:

"On their own, students contacted a quasi-celebrity in our city who is involved in a consortium dealing with the problem. He came and spoke to the class and had a great article in the newspaper. We visited a supermarket where they would have access to hundreds of items and could evaluate the efficiency of the packaging. They wrote letters to some companies that they determined had the best and the worst wrapping practices. The response from the companies has been very good. I hope they have seen that their opinions matter."

Students, when questioned on evaluation forms about the most significant thing they learned during the module, supplied the following examples:

- Knowing that whatever decision people make, no matter how good, something will always go wrong and garbage will always be a problem for us to solve.
- No matter how you try to avoid it, a landfill is always in someone's backyard.
- I am buying bigger economy

NYSTEP photo

Regarding the fine print

sized boxes and less plastic packaging.

- I thought that learning that everybody has a different opinion and even though some people are for incinerators and landfills (which I'm against) they have a reason for their choice and should be respected no matter how I personally feel about it.

NYSTEP is a cooperative venture between the New York State Education Department, the Atmospheric Sciences Research Center of the State University of New York at Albany, the New York Power Pool, Columbia Gas of New York and the National Fuel Gas Distribution Corporation. Major funding of curriculum development comes from the National Science Foundation. Modules currently in pilot or field use engage students in the study of STS issues within the general topic areas: land use, water resources, epidemics, natural disasters, communications, wildlife, futurism, transportation and solid waste management. DEC's divisions of fish and wildlife, water, lands and forests and solid waste are all assisting in the continued development of these modules.

This curriculum development project involves science teachers, practicing scientists and engineers and minority students. An advisory committee composed of leading science educators, business and industry representatives and educational researchers provides advice regarding the development process.

The expertise of federal, state and regional agencies and research institutions is also sought throughout the curriculum development process. DEC's division of solid waste, for example, has supplied technical assistance and financial support for the development of the solid waste module from its inception. Dr. William Peruzzi, the project coordinator for NYSTEP, relates that "the input of these specialists, who spend their working lives grappling with issues related to solid waste, has enhanced the quality of the materials. They have gone the extra mile in seeking to provide materials to teachers involved in both the pilot and field tests of the module on solid waste." Additional expertise related to solid waste has been supplied by the U.S. Environmental Protection Agency in New York City, the geological survey of the New York State Museum and Science Service and Cornell Cooperative Extension.

Field versions of the modules have been tested in contrasting rural, urban and suburban environments across the state. (Student comments at the beginning of this article were in fact, gathered from remarks made during development of the module.) The finished product will be distributed in conjunction with teacher workshops hosted by the various electric and natural gas companies across the state. Middle level science teachers, at these workshops, will receive an orientation to the entire set of materials and specific instruction in teaching strategies from leaders drawn from a cadre of 40 NYSTEP resource agents who have been involved in the curriculum development phase of the project. In addition, teachers will receive intensive instruction in science, technology and society education.

A new middle level science syllabus from the State Education Department is being created in dynamic relationship with the NYSTEP curriculum development process. This syllabus will encourage attention to science, technology and society issues as part of science instruction at middle grades. The supplementary modules of NYSTEP are an important means by which these STS understandings can be accomplished within middle level science instruction.

Further information about the solid waste module and other materials from NYSTEP may be obtained by contacting NYSTEP, 89 Washington Avenue, Room 232-M, Albany, New York 12234.

Here is a list of selected schools rural, urban and suburban environments that piloted the module:

I.U. Willets Road School (suburban, Long Island); Deposit Central High School (rural, Deposit); Notre Dame - Bishop Gibbons High School (non-public, urban, Schenectady). Thomas C. Armstrong Middle School (rural, Ontario Center); Camillus Middle School (suburban, Camillus); Newark Junior High School (suburban, Newark); Tamarac Middle School (rural, Brunswick); Orchard Park Middle School (suburban, Orchard Park); Edgemont Junior-Senior High School (suburban, Scarsdale); Vestal Hills Elementary (suburban, Binghamton); Mount Vernon High School (urban, Ithaca); M.C. Miller School (urban, Kingston); PS 144 (urban, The Bronx)

Dennis W. Cheek is the coordinator of curriculum development for NYSTEP. He holds degrees in biology and history and a Ph.D. in curriculum and instruction from Pennsylvania State University. He is the author of numerous publications related to STS education.

J.E. DuPont

The Petrified Gardens in Saratoga Springs are a remnant of an ancient seashore of half a billion years ago.

Algae From Antiquity

The "cabbages" of Saratoga are a 500-million-year-old rarity.

by Donald W. Fisher

About half a billion years ago, a time geologists refer to as the Late Cambrian Period, the northeastern North American continent was a land devoid of grass, trees and animals with a bizarre appearing intertidal coast. Whereas this area was near the site of the present Adirondack Mountains, the mountains themselves did not come into existence until some 495 million years later.

Imagine, if you will, a relatively wide continental platform bathed in shallow, clear, warm water similar to the present day Florida peninsula. Twice daily, incoming and outgoing tides both renewed and removed sediment and dead organic material. The cycle was further affected by oceanic waves which, breaking offshore in the surf zone, had their energy dissipated prior to reaching the beach. Offshore shoals fringed the southeastern margin of this low-lying peninsula.

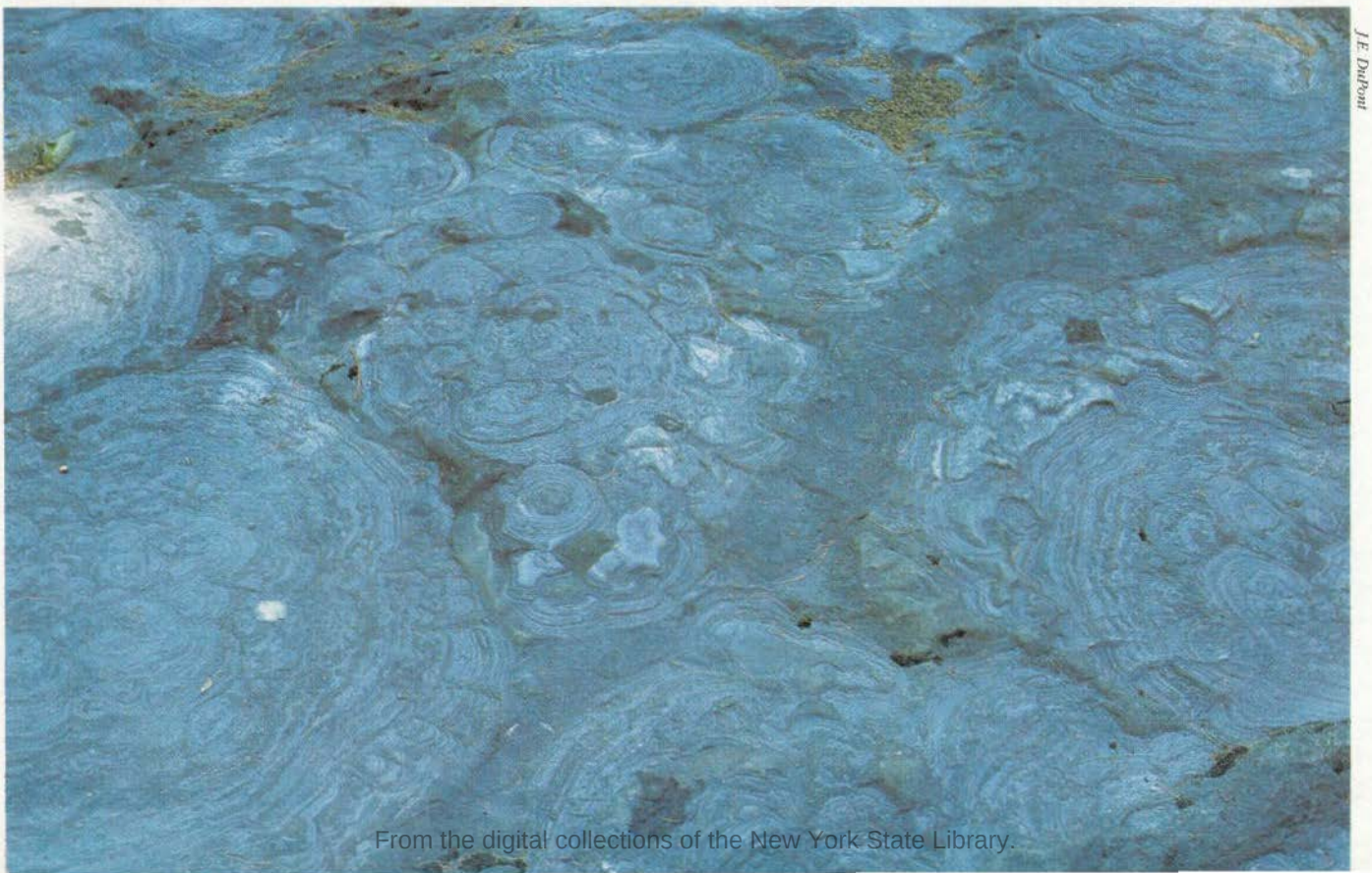
Because the eastern North American crust of the Late Cambrian Period was stable, it allowed a relatively greater amount and diversity of shelf marine life than had been previously known.

Amidst all this sea activity were toadstool-like structures of primitive colonial blue-green algae. The firm continental shelf was host to myriads of these dome and club-like mounds which were intermittently exposed during low tide and inundated or nearly so at high tide. Incoming

(Opposite page) One of the several fractures (or bedding planes) caused by centuries of running water, alternate freezing and thawing and glacial action.

A vertical section of cryptozoons along one of the many crevices present in the formation

A close-up of several of the petrified "cabbages" and "brussels sprouts"



J.E. DuPont

NYS Museum

Paleontologists come from all over America to study the unusual formations in the Petrified Gardens.

This was what the coastline of eastern North America looked like during the Late Cambrian Age when the cryptozoon bearing rocks were deposited in the area of Saratoga Springs.

tides brought and left skeletal remains of bottom dwelling shelf animals, mostly trilobites, remote ancestors of today's crabs and lobsters, along with other small invertebrates — snails, brachiopods and the like. These vagrant bottom dwellers may have come ashore to seek food or to flee from predators or were brought ashore involuntarily by the incoming tides, wave action or via long-shore currents.

Today, these compressed fossil algae, termed cryptozoons or stromatolites by paleontologists and "cabbages" or "brussels sprouts" by laypersons, are exquisitely preserved at the Petrified Gardens (or Ritchie Park) about three miles west of Saratoga Springs. The gardens are part of an ancient rocky ledge called the Hoyt Formation. It is the finest algal reef structure of its kind in eastern North America, aside from a small outcrop north of the gardens known as Lester Park.

The fossils were laid bare by the passing of continental glaciers during the last Ice Age which ended 12,000 to 15,000 years ago. In the 1850's, a German naturalist named Genscher became intrigued with the layered rock he found at quarry sites west of Saratoga. In 1883, James Hall, New York's first state paleontologist and the "father of North American paleontology" studied these ancient organic structures and, concluding they were a mystery, named them *Cryptozoon* (Greek: *kryptos* - hidden; *zoon* - animal).

Then in 1922, Robert F. Ritchie, Sr., a stone mason and an amateur geologist, was helping retrieve a cow from one of the many crevices which dotted a field near his summer home. Pulling away the sod, Ritchie discovered a stone ledge patterned with strange looking concentric circles. Ritchie thought them unusual enough to send them to the State Museum where they were identified as cryptozoon fossils. He hired a crew to unearth the ledge, eventually clearing off almost two acres of the rocks. In 1924, he opened the site as the Petrified Sea Gardens. The site was enlarged during the 1930's by the Civilian Conservation Corps.

To the visitor, many of the cryptozoons appear as roughly spherical, globular or lenticular "heads" resembling squashed down cabbages or brussels sprouts depending on their size. Others are wave-like layered undulations when seen in cross section. Still others are virtually flat, planar layers of algal mats. In varying degrees, these algae functioned as sediment traps, enmeshing sand, silt, clay and carbonate particles that had been washed off the neighboring land mass. However, because they secreted large amounts of lime (calcium carbonate), the blanket-like algal reefs (biostromes) and isolated baffles are composed of limestone with lesser amounts of quartz sand and silt and clay minerals. Interbedded with the three distinct blanket reefs are dolostones, originally limestones which subsequently had been altered by magnesium-rich water. There are occasional shale beds with lingulid brachiopods.

Collectively, this formation is known as the Hoyt Limestone named after the long-abandoned Hoyt Quarry less than one mile north of the Petrified Gardens at the New York State Museum-owned Lester Park. The Hoyt Formation is of Late Cambrian age (515 million years old) as determined by the entombed fossils found there.

During the many millennia that the Hoyt Formation has been uncovered by removal of

NYS Museum

Cryptozoon exhibit at the New York State Museum

Modern stromatolites, or cryptozoons, living in the intertidal zone at Shark Bay in western Australia. The beach is at low tide. The algae live atop these mushroom shapes which look that way because of the swift tidal currrents that keep eroding their bases.

younger strata, it has been a target for destructive erosion. Running water, alternate freezing and thawing, punishment by overriding glaciers — all have exercised prominent roles in reducing original rock volume. Roughly parallel horizontal fractures, called bedding planes, and nearly vertical fractures, termed joints, serve as avenues for percolating ground water charged with carbonic acid. This chemical solution enlarges the fractures and reduces the mass of the rock. Furthermore, the continental glaciers of 250,000 to 25,000 years ago reshaped, polished and removed any irregular projecting rock. Locally, falling meltwater from receding glaciers gouged circular or oval-shaped cavities in the Hoyt reefs, thus greatly modifying them. These fractures are quite prominent in the Petrified Gardens.

To interested laypersons, the Petrified Gardens are an interesting remnant of life from prehistoric times. But to paleontologists who are always seeking new clues to the past, the Petrified Gardens represent a stroke of good fortune. We are able to recreate this ancient environment by comparative study of an equally bizarre occurrence, the discovery in modern marine waters of identical living cryptozoon (colonial algae) in Shark Bay along the coast of western Australia. When James Hall and later Winifred Goldring, New York's fourth state paleontologist, studied these unique organic structures, they thought they recognized three different species of cryptozoons based on their different geometric patterns. But in 1961, Brian Logan, in his comprehensive study of the cryptozoons from Shark Bay, was able to demonstrate that the differing shapes were neither a morphological nor a physiological distinction but rather a growth response to the life position on the shallow shelf. Thus, while fossil blue-green algae occur in a great variety of shapes and sizes in the geologic record, most of these differences are ecological and do not signify separate species.

Courtesy Gerry Ross, Washington University, Virginia Isaacson

Today, geologists refer to most algal structures in sedimentary rocks and sediments as "stromatolites." They are composed of loose sediment derived from the immediate area and are regarded as sedimentary structures produced by a mixture of sediment, sediment binding algal mats and various types of minerals already found there (calcite, dolomite, silica). They also derive their size and shape from the depth, agitation, temperature and salinity of water. The Hoyt Formation also contains disseminated spherical bodies of calcite, dolomite or silica of from 0.5 to two millimeters in diameter. these "oolites" as they are termed, are indicators of high energy zones where currents, though local, were relatively vigorous. All available evidence supports construction of these stromatolites in the intertidal and shallow upper sub-tidal zones.

In addition, there exists a cementation process accomplished by a precipitation of the mineral aragonite (calcium carbonate) in the space between detrital grains. This process is comparable to the cementation of beach pebbles and shells into conglomerates or coquinas — both common in intertidal zones of tropical and subtropical seas. Assuming a similar cementation process, it is highly probable that the cryptozoons found in the Hoyt Formation indicated tropical or subtropical temperatures. Thus, both the living Shark Bay and the fossilized Hoyt Formation, although separated by 10,000 miles and 500 million years possess stromatolites of like size and shape in a restricted, very salty, intertidal and shallow subtidal tropical environment along a low-lying seacoast. Truly, the present is the key to the past.

Today, the Petrified Gardens are attracting attention of a less scientific sort, causing great concern to both amateur and professional paleontologists, not only because their existence is threatened but also because of the continuing research going on in the immediate vicinity. The gardens are sandwiched between two rival mining companies. Both companies want a chance to extract the limestone closer to the gardens, and both have applied for rezoning permits which would allow them to do so. Both companies deny any intention of destroying the Petrified Gardens, but those interested in preserving the formation would rather have the gardens preserved as an important geological site, possibly under the protection of the current "Friends of the Park" or by some similar non-profit organization. At the very least, Friends of the Park want to maintain the present "conservancy" zoning they now enjoy. But despite an almost 20-year dispute, no resolution appears to be in sight.

The Petrified Gardens are located three miles west of Saratoga Springs, on Petrified Gardens Road off NY 29. They are open daily from 9 a.m. to 6 p.m., May through October and by appointment the rest of the year. There is a small admission charge.

Donald W. Fisher was for 27 years New York's state paleontologist. Now retired, he lives in Kinderhook. He has been a frequent contributor to THE CONSERVATIONIST.

Letters

A Cruel Death

I thought possibly you might be interested in printing this picture of the raccoon I found while hunting turkeys this spring. The scratching on the tree shows he must have died a horrible death.

I have been hunting for more than 60 years and never saw this happen to any wildlife. Hope it is of interest to your many readers.

Griffin Brooks
Stamford

• *The above depiction is a perfect illustration of the old saying that it is far from easy to determine whether Nature has proved to be a kind parent or a merciless stepmother.*

— Editor

Litter at Pineville

Last October we took our sons, ages 10 and 13, to see the salmon run in Salmon River above Pulaski. We watched from the bottom of the Altmar Hatchery as the fish (most so large that almost half their body height was above the water) struggled to reach their instinctive destination. Then, in hopes of seeing someone bring in the "big one," we stopped at the Pineville Fishing Access Site.

We were appalled and disgusted as soon as we entered the parking area: we have never seen such an amount of trash. Thousands of yards of heavy monofilament line, hooks, plastic bags, fast-food and other food garbage — anything that broke or was no longer needed was dropped and left. This continued along the riverbank as well. Trash receptacles were in plain view in the parking area.

The cost for cleaning up after these inconsiderate slobs should fall on those who create the problem; ideally these people should be prohibited from the area. Couldn't a special license surcharge (dedicated to litter enforcement) be required of anyone "fishing" the restricted snatching areas of Salmon River?

It is very hard to instill an environmental conscience in our children with such blatant examples before them.

Jean D. Miller
Orchard Park

Why Not Recycled Paper?

We subscribe to THE CONSERVATIONIST and while we always enjoy reading it, the one thing that bothers me is the fact that it is not on recycled paper. New magazines have commenced publication and find sources of such so I wonder why this has not happened with the official publication of the New York State Department of Environmental Conservation?

Mrs. Barbara Patrick
Esopus

• *Recycled paper is more expensive than regular paper, is not always available in the quantities that we need and sometimes does not meet requirements for whiteness and opacity. Nevertheless, we expect that as the demand for recycled paper increases, paper companies will be able to remedy these deficiencies. THE CONSERVATIONIST is seriously considering using recycled paper in upcoming issues.*

— Editor

A Helpful Outdoor Hint

Your local pharmacy carries alcohol "prep" or "scrub" pads which consist of a square of gauze impregnated with 70 percent isopropyl alcohol. Sportsmen carry them in their first aid kits to treat skin abrasions or insect bites.

These pads will act as an excellent solvent to remove insects from your windshield and, because the alcohol burns with a very hot flame, they are the perfect answer to starting fires back in the bush.

Convenient and safe to carry, just remove a couple of pads from your wallet, place them on their envelopes and the flame will burn long enough to start that fire or sterilize your knife blade.

Be sure it's OUT before you leave!

Robert Curtis
Hamilton

From Whence Came This Bear

During the afternoon of July 4, 1990 this black bear spent about 20 minutes exploring our yard in Ulster County's Catskill Mountains. We observed from as close as 15 feet from the second story deck. At one point, he almost started up the stairs to join us.

This is a male bear with a red tag in his left ear. The number on the tag reads 91 (or 16 upside down). Our district forest ranger said the bear might be from New Jersey or Pennsylvania but that New York doesn't use tags such as this.

The bear showed no fear but also no aggressiveness. He appeared disoriented or drugged almost deliberately putting on a show for us. I would guess his weight at about 300 pounds judging by my 85 pound Labrador retriever who calmly sat by my side and watched the show.

I would like to know the story about this bear. As of August we didn't see him again.

Roger Dickson and Bill Wagner
Samsonville

• *This was a real puzzler until we got in touch with Dick Henry, a DEC wildlife biologist from Region 3 in New Paltz. After a few phone calls Dick found out that bear #91 is a male and was originally tagged in Wawaynda State Park, New Jersey in June of 1988. At the time of its release it weighed 80 pounds and was 1½ years old. At present no record exists of its whereabouts.*

— Editor

Thanks for Return of Bald Eagle

I had to write and thank The Conservationist for its article on the Return of the Bald Eagle to New York State. I was raised in the Helderberg Mountains outside of the village of Rensselaerville and not far from the Alcove Reservoir where one of your hacking stations is located.

Those years have provided me with lots of great memories. I was reminded of one as I read your article. Our family was fortunate enough to see a bald eagle fly over our farm sometime during the late 1960's. I didn't know much about eagles, I was probably 10, but I knew enough to realize we had seen a very rare sight. I felt privileged and vowed never to forget it.

It is reassuring to know that New York State has a restoration project. Maybe thanks to all the caring folks involved, my children too will have the "privilege of watching a bald eagle soaring against a powder blue New York sky."

Kate B. Murphy
Onalaska, Washington

An Irresistible Chippie

With the fear of rabies in the area, I would say that this picture represents one of the *don'ts* when around these friendly little animals or any other wild animal. This chipmunk couldn't resist a helping hand full of salted sunflower seeds and I couldn't resist taking this unusual picture.

A. R. Capalupo
Utica

The Return of Q & A

I am delighted that you have returned the "Your Questions Answered" feature to the magazine. To me this is one of the most interesting sections of an unusually fine and always interesting publication.

Harriet R. Dowdall
Burlington Flats

Error in Bio

I wish to correct an error in Barbara McMartin's article in the July-August, 1990 issue. Barbara McMartin does not write guides for the Adirondack Mountain Club. The eight guides in ADK's *Forest Preserve Series* are written by several authorities on Adirondack and Catskill trails, including Tony Goodwin, Peter O'Shea, Bruce Wadsworth, Arthur Haberl, Betsy Tisdale and Linda Laing Coulter. The series is under the overall editorship of Neal S. Burdick of St. Lawrence University, and proceeds from sales go toward supporting the club's program of conservation and education.

Carmen P. Elliott
Publications Director
Adirondack Mountain Club

To Our Readers

We enjoy receiving your letters and would like to publish as many as our limited space permits. Please keep your letters short. And to ensure a prompt response, please send them to our editorial offices at 50 Wolf Road, Albany, NY 12233 and *not* to our circulation office at Box 1500, Latham, NY.

Thank you.

Books *conducted by Joan Taylor*

The Wildlife Series: Ruffed Grouse, Sally Atwater and Judith Schnell, editors, 370 pages, Stackpole Books, $59.95.

Stackpole Books, in Harrisburg, Pennsylvania, is undertaking a new series of very thorough and artful books on wildlife. The first in this series is *Ruffed Grouse*, it will be followed by books on white-tailed deer and trout.

It appears that these books will use a team approach. *Ruffed Grouse* is edited by Sally Atwater and Judith Schnell, with contributions from scores of artists, photographers, outdoor writers, academics and wildlife professionals.

Ruffed Grouse is a textbook disguised as a coffee table book, with something of interest for naturalists, wildlife managers, birders and hunters. It exhaustively describes: the grouse's anatomy and behavior, including courtship; habitat; seasonal behavior and the effect of hunting and predation on populations.

Ruffed Grouse introduces readers to wildlife science. It is a midpoint in hunting and nature writing and scientific writing; more detailed and systematic than a hunting article might be; yet more accessible and easier to read than a scientific paper.

The authors in this book show that systematic study of animals can occur, without removing the sense of wonder about them. For example, modern high-speed photography has ended the myth that male grouse drum to attract a mate by beating their wings on a log or other "drumming spot." The drumming comes instead from a miniature sonic boom, which is created as the grouse flexes its wings.

Ruffed grouse co-exist, in finetuned interdependency, on a 10-year population cycle, with the hare and predators such as the lynx, goshawk and owl.

The cycle has been modeled by L. B. Keith and begins with the hare reaching peak populations. As this occurs, predator populations rise in response to the increased supply of prey.

However, predators deplete the hare. As this occurs, they switch to eating grouse, whose populations have increased while predators have focused on the hare. Then as grouse decline, so do predator populations.

The hare begins the cycle again. As food vegetation recovers from the earlier demands of the larger populations and as predator populations are low, hare populations begin to expand again.

Ruffed Grouse is well indexed and organized. It is also generously illustrated with color photographs, paintings and maps and charts. These are well captioned and complement the text.

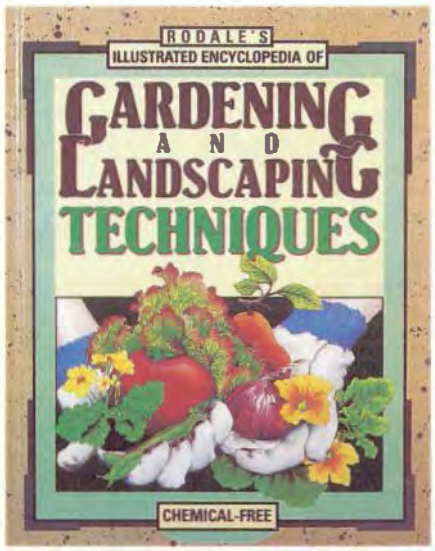
Hunters should realize that this book is useful, but not for technique or weaponry, topics that are barely mentioned. Instead, *Ruffed Grouse* will help hunters by understanding behavior and habitat, so that each hunting trip can be more productive.

The two major difficulties with this book are the massive amounts of information it contains and its cost. Readers can solve the first problem by reading a section or two at a time, and by using the extensive index. The budget conscious might want to preview the book at their library.

These concerns aside, it is nice to know that the nature and sporting market is large enough to inspire the publisher to sponsor a book as comprehensive and attractive as *Ruffed Grouse*.

—John Rowen

Rodale's Illustrated Encyclopedia of Gardening and Landscaping Techniques, edited by Barbara W. Ellis, 426 Pages, Rodale Press, Emmaus, PA 18098, $23.95.



In the doldrums of winter we dream great dreams of summer splendor. The garden catalogs are stacked by a chair with favorite plants noted and a search for new glory is constantly underway.

If gardening is a new experience or new territory is waiting to be tamed, *Rodale's Gardening and Landscaping Techniques* will be the way to success.

The basics are there. If the soil is not prepared, the yield will be poor. Knowing your soil, working it and amending it are discussed in great detail. Composting, care during the season and plant propagation mean the difference between a great garden and mediocre results.

The section on compost is a gem. After reading it anyone can be an

expert. No excuses will do for not using this no cost method of soil enrichment. All of the household kitchen wastes (except meat, bones or grease which are slow to decompose and attract undesirable creatures) are utilized. It is amazing to note the drop in material for the trash collector. Those with limited or no space for a compost pile can use a described garbage can technique.

All of the Rodale Publishing books are environmentally oriented. As publishers of the original *Organic Gardening* magazine and the *Encyclopedia of Organic Gardening* which has been updated over the many years it has been in print, the emphasis has always been on chemical-free gardening.

As we read about the dangers of lawn and garden chemical care, it is even more important to work with the soil and not against it.

Gardening and Landscaping Techniques may not have all the information you may need to understand the organic method of growing and caring for flowers, vegetables, fruits and berries, lawns, groundcovers and houseplants, but give it a try as the most comprehensive book you will find for good winter reading.

—J.A.T.

Enjoy the Audubon calendar line for 1991 with its irresistible photographs and two new additions.

New York's Mohonk Preserve is featured as a model of land reclamation on the new **Endangered Planet Calendar**. Breathtaking photographs of our threatened ecosystems such as salt marshes, wetlands and endangered species are offered as a monthly reminder of concern for the environment. Proceeds from the sale of this calendar will directly support Audubon's conservation programs, making a real contribution to environmental protection.

The other new addition to the 1991 line, the **Audubon Wildflower Calendar** pleases the eye with wonderful shots of a field of yellow and orange poppies, stark white bloodroot glistening with raindrops and a mosaic of arrow-leafed balsamroot and lupines seen through the branches of an Oregon white oak. An introduction, The Cat's Tail, by Les Line presents some interesting facts on the ubiquitous cattail.

The **Audubon Engagement Calendar** makes a perfect gift for a year's worth of pleasure. A somber faced Florida panther for April and October's Cyrano-nosed moose cow feeding on water plants were my favorites. All major American and Canadian holidays, astronomical information and a directory of National Audubon Society offices, ecology camps, sanctuaries and nature centers are listed.

The **Audubon Nature Calendar** presents the natural wonders of North America in vivid photographs shot by the world's top naturalist photographers. Evening primrose and popcorn flowers on the coastal dunes in Sonora, Mexico vie for attention with a black bear feeding on ripe chokecherries in Michigan and sugar maples in snow in Vermont.

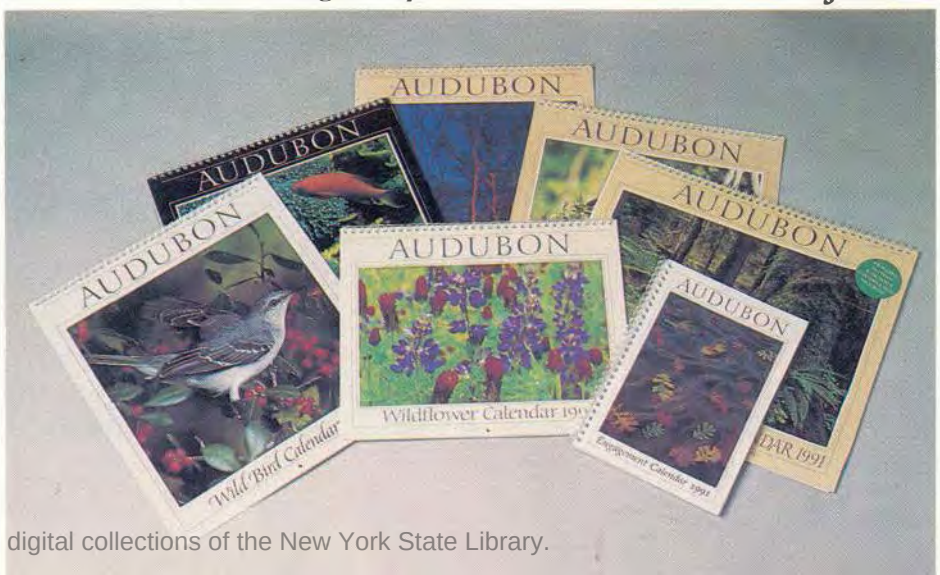
A bird lover's delight is the **Audubon WildBirdCalendar**. Wild birds around the world from a great gray owl to the common European swallow drinking from a pond are beautifully photographed. This is one of the most appealing of Audubon's calendars.

The **Audubon Sea Life Calendar** offers brilliant purple queen basslets from the Western Caroline Islands, a Galapagos sea lion basking in the surf and a hawksbill turtle swimming by a gorgonian coral. The splendor of the undersea world is revealed by noted marine photographers.

Animal lovers or just anyone interested in marvelous pictures of fishing bears, inquisitive coyotes or a fox hiding in yucca and peering at an intrusion will love the **Audubon Wild Animal Calendar**. All of the wild animals are depicted in their natural habitats.

Solve gift giving by indulging your recipients with beauty to enjoy the whole year. The desk calendar and the new wall calendar on the endangered planet are $9.95 each while the other wall calendars are $8.95 each. All the calendars are spiral bound and gift boxed in a self-shipper and are available at bookstores or through Macmillan Publishers.

—J.A.T.



W. Halpy

Your questions answered

Nasty Jays

In June 1990, I witnessed what I thought was a very strange sight. A blue jay had a young sparrow pinned to the ground by its wings. The jay appeared to be in the process of killing the sparrow when I interrupted this event. The sparrow's mouth was bloody and the bird appeared to be stunned. I sprayed the sparrow with some water, and that seemed to help it recover. I waited around for about 15 minutes until it was able to join its parents. However, through the sparrow's recovery, the blue jay kept returning. My presence kept the jay from attacking the sparrow. I have seen blue jays chase crows, and I know they will rob other bird's eggs and young, but I did not think they would attack a young sparrow that was independent of the nest.

John Sardone
West Hempstead

A blue jay is extremely aggressive and will attack and kill any other bird it perceives to be sick, injured or as in this case, young. Despite a bad reputation, a blue jay can add a noisy and even beautiful note to an otherwise dull landscape. And because it is so prolific, I expect the blue jay will continue to be bothersome both to humans and to other birds.

— J.J.D.

How Much Sugar

I am concerned about nutrition for the hummingbirds and the sugar-water that we feed them (1:5 ratio). Can something be added for improvement? The water is hard well water. Could apple juice be added?

Norman R. Kurdell
Pound Ridge

The Country Journal Book of Birding and Bird Attraction *by Alan Pistorious (W.W. Norton & Co. 1981) has this to say about the proper nutrition for hummingbirds: "What you feed in a hummingbird feeder is a sugar water solution; but which sugar? If honey has at least a few nutritionally redeeming qualities while white sugar has none, oughtn't honey be used for hummers too? The people at Arizona's Mile Hi Ranch, who feed as much as four gallons of syrup a day through 20 feeders say no. They maintain that birds find ordinary sugar more easily digestible than honey. Additionally, honey is subject to fermentation during hot weather, and fermentation produces alcohol, which kills beneficial microorganisms in the bird's digestive tract. I imagine that apple juice may have the same effect or may turn to vinegar. While many people feed a three-to-one mix, the Mile Hi formula is four parts water to one part sugar— the former boiled to kill bacteria and ensure a good mix.*

— J.J.D.

Favorite Lunch Site

We found this five feet across by three and one-half feet high mound of pinecone kernels and cores in an area between conifer and hardwood forest near our house.

Can you give us any idea what type of animal(s) might eat in the same area long enough to make such a pile?

Could it be some type of squirrel (note hole in tree above) or a porcupine?

Any information or ideas would be much appreciated.

Faith Tidd
Cohocton

The mound you have photographed is probably the work of red squirrels. They will often find a favorite spot with good visibility to do their munching. Being creatures of habit, they will use the same location for a long period of time.

— W.J.T.

Abandoned Robin's Nest

This spring a robin made a nest and had babies in my bird feeder. She has been a delight. I have seen nothing of her or the chicks for a week. I have thought of getting rid of the nest. Is that wise or will she use it again?

Donita O'Dell
Nikiski, Alaska

Robins build nests in shrubs, tree forks, horizontal branches or any substantial ledge. Incubation is by the female for 12 to 14 days. The robin has two and possibly three broods, so it is best to leave the nest intact for a possible return engagement.

Next year you could build a small platform near the feeder to attract the returning robins to a new nesting area.

— J.A.T.

A Rocket By Any Other Name

For many a springtime, I have been calling this delightful purple and pale blue flower a phlox. I think it was last year that you identified it. The phlox has five petals and this four petaled flower is not phlox. This springtime I cannot remember the name that you gave it. It is such a beautiful little wildflower that colors the woodsides all the way south from Geneva to Harrisburg.

Please help me identify it. I have flower books but can't believe that it isolates itself so from my identification.

Betsy Dean
Geneva

Small wonder that you had difficulty with the identification of Hesperis matronalis *as it has an amazing diversity of common names. Try damask violet, sweet rocket, dame's rocket, purple rocket, white rocket, rucchette, roiquet and dame's violet for a start. Earlier names include queen's gillofers, summer lilac, evewed, double sciney and dose sciney. Honest! This flower of many names appeared on the July-August 1989 cover mistakenly identified as phlox. In the November-December issue, we printed a letter from William Chapman of New Hartford explaining the identification and uses of this often confused plant.*

Scentless during the day, Hesperis matronalis *gives off a lovely fragrance in the evening. It smells as sweet by any of its names, but don't call it phlox.*

—J.A.T.

Carnivorous Chipmunk

A few weeks ago I went out to my driveway and saw a dead baby robin there. Before I could remove

it, a chipmunk ran out, picked it up and started carrying it away. I wanted to see what would happen next, so I tied a string to the robin's foot and anchored it. After some time, I was able to get the enclosed picture of the chipmunk eating the robin.

I had heard of red squirrels eating eggs and the young of birds, but never had observed or heard of chipmunks eating meat.

Is this common?

Carl L. Lewis
Corfu

Squirrels and chipmunks are generally thought of as being herbivorous but they will eat the flesh of other animals when the opportunity presents itself.

— W.J.T.

Hungry Porkie

I need help very badly. I have a cabin in Wurtsboro, Sullivan County and the porcupines are eating everything. Do you know a way to get rid of them other than traps and guns? I don't like to trap and kill them but I have tried everything and they still come and destroy everything. Please help.

Charles Landman
Cuddebackville

Porcupines are attracted by any substance containing salt and will go through just about anything to get it. One method of preventing porcupine damage is to fence in any area that you want protected with at least a three foot high fence of chicken wire. Certain chemicals found in wood preservatives will also repel a porcupine. Pentachlorophenol or copper naphanate are two such common substances used in these preservatives. As usual, one should follow directions carefully when applying.

Nancy Heaslip
Regional Wildlife Biologist
Nuisance Wildlife Unit

B. Ivy

Environmental Perspective conducted by Mary Kadlecek

Alternative Energy — Hot Again?

Wind power and other "alternative energy" sources were hot topics during the environmental heyday of the early 1970's, but today the only remnants of those early enthusiasms seem to be occasional barrel-windmills rusting away in backyards.

So it was something of a surprise to find in a recent journal of the Electric Power Research Institute (EPRI) pages of photos showing huge fields of wind turbines. During the past decade, California utilities have developed these large wind power stations in high-wind mountain passes. According to EPRI, utilities and the wind industry are making wind power economical, even without financial incentives. Further, the utilities and wind energy companies are working aggressively on an advanced, utility-grade turbine for an even more cost-effective generation of wind power stations.

In California today, some 15,000 wind turbines are in operation, producing more than one percent of the state's electricity. The cost of modern turbines is roughly comparable to the capital cost of other forms of power generation, and maintenance problems are coming under control. And, of course, recent political pressures on oil prices may make wind generation fully competitive faster than anyone expects.

The New York State Energy Plan, developed in 1989 by the State Energy Office, the State Department of Public Service and DEC, calls for accelerated research, development and demonstration of wind and other renewable resource technologies. State Energy Research and Development Authority (NYSERDA) staff involved with energy source projections point out that California was an obvious place for initial development of wind power stations because the state has large areas with excellent winds and a need for additional power-generating capacity.

In New York, both the wind potential and the power need are lower. We have few areas where wind conditions are excellent for power generation, but we do have locations with very good winds. Generating power in these areas might be cost effective with the improved technologies now being developed in California and elsewhere. The energy plan recommends investigation of wind power's feasibility and establishment of a goal for use of this renewable resource.

For further information about the State Energy Master Plan, call the State Energy Office's public information office at (518) 473-4375.

Global warmth — and global light

Global lighting plays its part in global warming. In the United States, keeping light in our lives consumes one-fourth of the nation's electricity. Some of that power runs the extra air-conditioning needed to offset the heat produced by inefficient light bulbs.

All that electricity accounts for nearly half of the coal burned by the nation's electric utilities, and consequently a considerable volume of greenhouse gases dumped into the atmosphere. More efficient light bulbs would not only save electricity (and the fossil fuels used to generate it), but would cut down on air pollution, as well.

Building a better light bulb

Until "cold light" fluorescent bulbs came on the scene, the incandescent light bulb used to be our only option. Incandescents give off a quality of light comfortable to us humans, but they use a lot of electricity and produce waste heat. Fluorescents throw off little heat, but they produce a harsh light and often flicker and hum.

Now some good news for environmentally-canny consumers: Technology may not have built a better mousetrap, but it has produced an improved light bulb — several dozen, in fact.

Among the bright ideas in lights are highly efficient bulbs that yield the same quantity and quality of light as an incandescent while consuming just 25 percent of the electricity.

Also available: solid state electronic ballasts that eliminate hum and flicker from fluorescent lights, photosensors that dim lights when-

ever sunlight is available, mirror-like reflectors that provide the same quality of light with half as many fluorescent lamps, polarizing lenses that reduce glare from fluorescents, and — a boon for parents! — sensors that turn off lights in unoccupied rooms.

Good things come in compact packages

Perhaps the brightest news in lights is the compact fluorescent. With every major lighting company in the world now making them, it won't be long before the super-efficient bulbs fill many of the nation's three billion light sockets. A "compact" delivers the same light as an incandescent bulb using four times the electricity, and lasts 10 times longer. For instance, one company says its 15-watt compact fluorescent lamp replaces a 60-watt incandescent bulb and saves $32.40 in energy costs over the life of the bulb (at 8¢ per KWH).

Not only will compacts keep more money in your pocket, but they will also help power plants produce less pollution. DEC's Division of Air Resources estimates that between 200 and 400 lbs. of carbon dioxide and other air pollutants will be spared from the atmosphere by using one compact bulb in place of an incandescent.

Best of all, according to the U.S. Environmental Protection Agency, a mid-size compact fluorescent bulb factory producing two million compacts per year costs only $7 million to set up and, over its lifetime will displace the need for a 350-megawatt coal plant with capital costs in excess of $300 million.

Finding Out About Toxics

Three years ago, the first nationwide inventory of toxic releases to the environment made headlines, most of them variations on the theme "Millions of Pounds of Toxics Released to Environment." Politicians, industrialists and citizens expressed shock and horror. Echoes of Bhopal sounded. Was this another case of back to business as usual?

Apparently not. Some people in industry actually seem to have gone to work on reducing toxic releases, to judge by the 1989 Toxic Release Inventory. At the same time, New York State has closed what DEC believes to be the last major regulatory loophole for toxic discharges, and has continued to tighten controls on toxics.

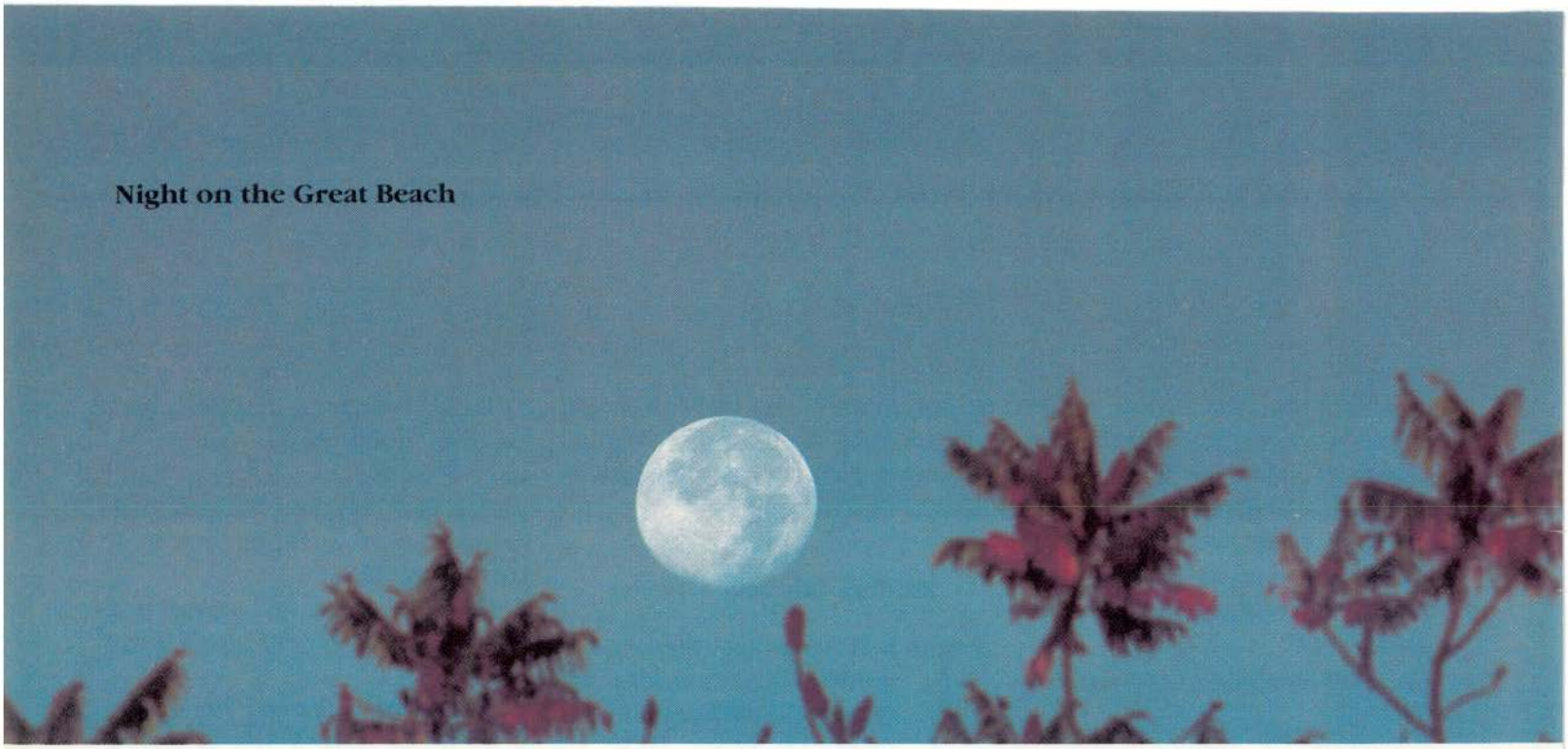
The latest Toxic Release Inventory Report says that release of toxics to New York's environment is lower than last year by nearly 15 percent: release totalled 99.6 million pounds in 1988, 85.5 million in 1989. Industries are switching to less-toxic raw materials, changing production processes to give fewer toxic byproducts and improving housekeeping to prevent unintentional discharge of toxics. More reductions can be expected as new pollution control equipment comes on line. Some major companies have even gone so far as to "take the pledge" that they will end toxic releases to areas other than their own properties.

New York State also responded to the hard numbers about toxic releases:

- Closing the only major regulatory loophole for toxic releases, DEC has drafted a regulation that puts controls on so-called "fugitive emissions" to air — pollution that gets out not from stack or pipe, but through ventilation ports, open doors and windows and other formerly unregulated sources. Watch for public hearing notices on the proposed regulation this spring.
- DEC's water pollution control program is intensifying its long-standing policy of "ratcheting down" the amount of toxics allowed in discharges.
- DEC's solid and hazardous waste regulatory programs are tightening the requirements that govern disposal sites and sponsoring increasingly aggressive recycling, reuse and waste reduction efforts. (For a series of hazardous waste reduction Success Stories in New York State, write to the Division of Hazardous Substances Regulation.)

Watch for next year's toxic inventory figures to monitor the continuous effects of all these programs.

Night on the Great Beach



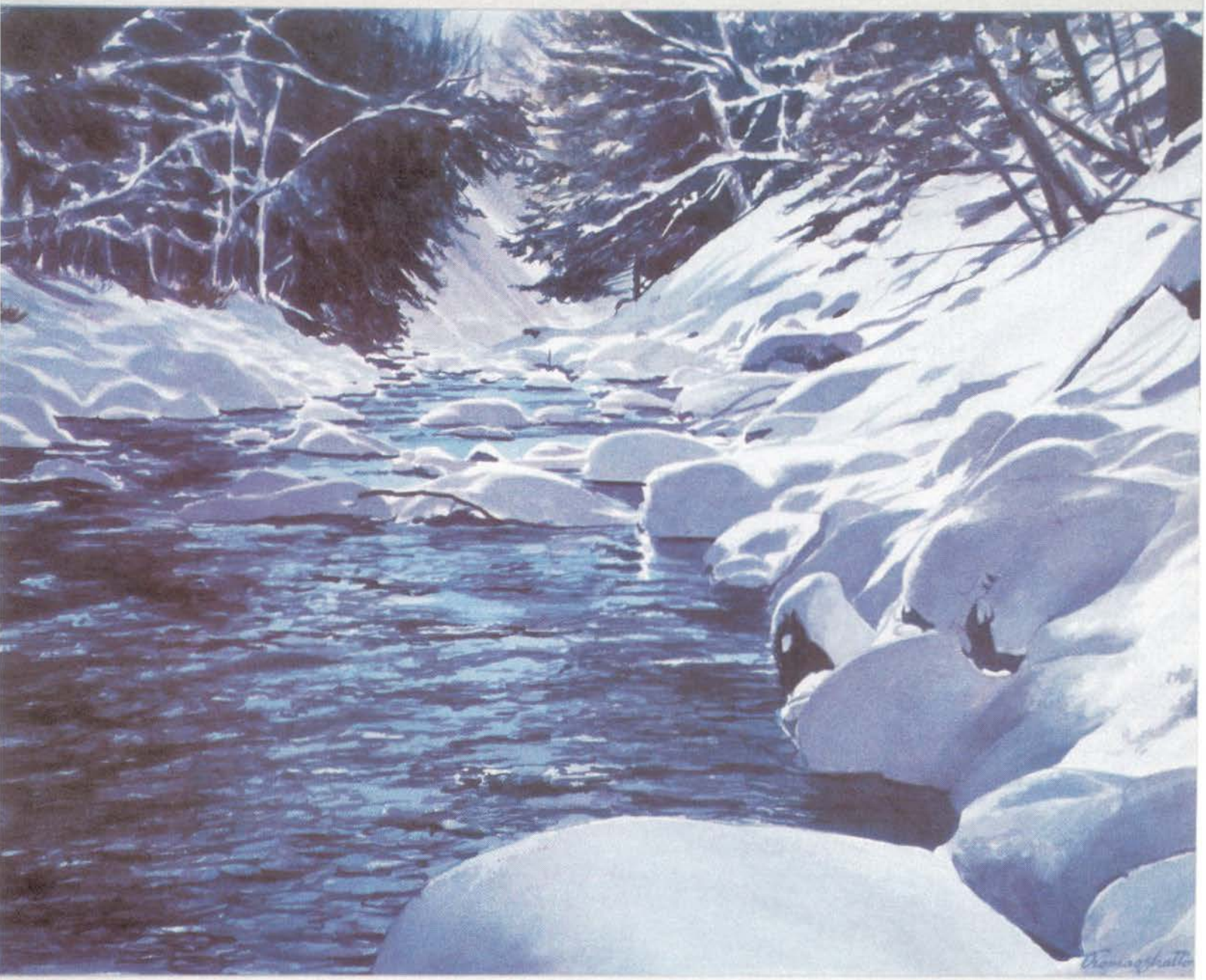
W. Banaszewski

Our fantastic civilization has fallen out of touch with many aspects of nature, and with none more completely than with night. Primitive folk, gathered at a cave mouth round a fire, do not fear night; they fear, rather, the energies and creatures to whom night gives power; we of the age of machines, having delivered ourselves of nocturnal enemies, now have a dislike of night itself. With lights and ever more lights, we drive the holiness and beauty of night back to the forests and the sea, the little villages, the crossroads even, will none of it. Are modern folk, perhaps, afraid of the night? Do they fear that vast serenity, the mystery of infinite space, the austerity of stars? Having made themselves at home in a civilization obsessed with power, which explains its whole world in terms of energy, do they fear at night for their dull acquiescence and the pattern of their beliefs? Be the answer what it will, today's civilization is full of people who have not the slightest notion of the character or the poetry of night who have never even seen night. Yet to live thus, to know only artificial night, is as absurd and evil as to know only artificial day.

Night is very beautiful on this great beach. It is the true other half of the day's tremendous wheel; no lights without meaning stab or trouble it; it is beauty, it is fulfillment, it is rest. Thin clouds float in these heavens, islands of obscurity in a splendor of space and stars: the Milky Way bridges earth and ocean; the beach resolves itself into a unity of form, its summer lagoons, its slopes and uplands merging; against the western sky and falling bow of sun rise the silent and superb undulations of the dunes....

Learn to reverence night and to put away the vulgar fear of it, for, with the banishment of night from the experience of man, there vanishes as well a religious emotion, a poetic mood, which gives depth to the adventure of humanity. By day, space is one with the earth and with man — it is his sun that is shining, his clouds that are floating past; at night, space is his no more. When the great earth, abandoning day, rolls up the deeps of the heavens and the universe, a new door opens for the human spirit, and there are few so clownish that some awareness of the mystery of being does not touch them as they gaze. For a moment of night we have a glimpse of ourselves and of our world islanded in its stream of stars — pilgrims of mortality, voyaging between horizons across eternal seas of space and time. Fugitive though the instant be, the spirit of man is, during it, ennobled by a genuine moment of emotional dignity, and poetry makes its own both the human spirit and experience.

— Henry Beston
The Outermost House



"Snowglow"

Watercolor by Tom Stratton