Vermont Environmental REPORT

Vermont Natural Resources Council

Fall, 1984

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Vermont Environmental REPORT

Fall, 1984

Published by the Vermont Natural Resources Council

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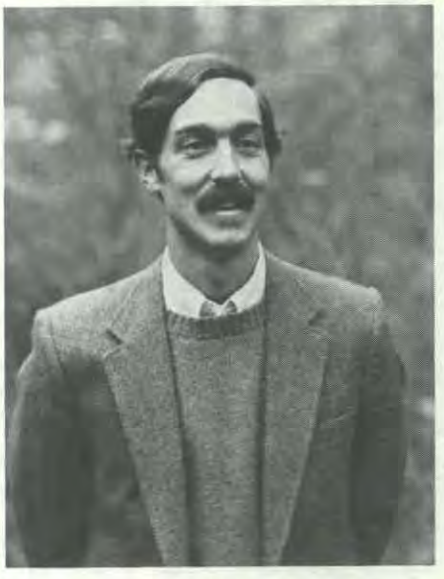
FROM THE EXECUTIVE COMMITTEE

We are happy to announce that VNRC has a new Executive Director. Louis (known as Lou) Borie has returned to Vermont after five years in Michigan. He left the Little Traverse Conservancy in the northern Lower Peninsula of Michigan where he was Executive Director. The Conservancy is a nonprofit organization with a smaller membership, staff, and budget than VNRC.

Lou graduated from the Environmental Program at the University of Vermont, and received his masters degree in natural resources from the University of Michigan. He has worked as a ranger naturalist on Mt. Mansfield, and a natural resource planner in the Virgin Islands, and taught at the School of Natural Resources at the University of Michigan. A writer and photographer, his articles have been published in the Burlington Free Press, Yankee Magazine, and the Nature Conservancy News. His strengths in administration, media relations and fundraising are well documented. We welcome him to lead VNRC down the road of growth and new accomplishments.

Other changes are upcoming on the Board of Directors. Three new directors will join the Board in January. (See **Council** notes.) At the October meeting, the following slate of officers was nominated for 1985: Mollie Beattie, Chair; Sarabelle Hitchner, Vice Chair; Ken Gayer, Treasurer. All served in 1984. The number of Board meetings will increase from four to six per year, allowing four of the meetings to be devoted to environmental issues, and organizational issues to dominate the other two.

The staff has a new organizational assistant now that its new IBM PC computer is up and running. We are now able to do our own internal accounting, manage our mailing list and membership records, and simplify our production of publications, all without an increase in staff and with the elimination of outside contract costs.



Lou Borie

What should be the future vision, purpose and mission of VNRC? At a retreat last summer, the directors discussed some exciting philosophies and goals. We think the Council should be the most prestigious, foremost environmental organization in the state. We want to be the principal educator and advocate of the environmental ethic. We realize that economic growth based on reasonable development is compatible with the wise use of natural resources. To preserve Vermont's uniqueness, we must maintain a clean, prosperous state for future generations.

From Vision to Reality

To help ensure the Council's success in its mission, the Board of Directors has become more involved in fundraising efforts. The Membership and Development Committee will soon reach out to a number of new individuals, businesses and foundations to expand our base of contributions. We must increase our revenues in order to meet the goals of the mid-80s. We appeal to you for help.

PLEASE CONSIDER MAKING A CONTRIBUTION NOW!!

LETTERS

To Mollie Beattie
Chair, VNRC Board of Directors:

When will it end? Perhaps it would be more appropriate to ask "when will it begin?"

I am referring to the cover photograph and caption on the most recent issue of the Vermont Natural Resources Council magazine. Your photographer went to great lengths to find and then shoot a trash pile at a condominium construction site. He was very successful in making certain that the angle of the photograph placed the "subject" in the worst possible light. But then again, a trash pile is a trash pile. The photo and caption were intended as scare tactics and, I presume, were successful. What useful purpose does that serve?

Do you really believe that construction can be undertaken without at one time or another having a pile of debris close by? Would it have been too much to publish another photo, such as the one I enclose with this letter, as well, showing the landscape when construction is completed? Ski areas are not "developer boogeymen" as VNRC officials have repeatedly charged during recent public meetings.

Are VNRC members at all interested in learning the facts and making an honest effort to forge solutions to our common concerns or is your organization determined to continue its present approach, which is exemplified by the cover photo and caption and other recent publicity efforts?

When will the misinformation, character assassinations and half-truths end? When will an honest effort be made to work with those of us interested in forging opportunities for Vermont and Vermonters?

Sincerely,
Preston Leete Smith
President and CEO
Sherburne Corporation

Response to Preston Smith:

Thank you for the photo of the finished condominiums at Killington. The buildings are indeed handsome; my compliments to you and your designers on the choice of materials and the refreshing departure from the standard "condo" architecture.

I have sent the photo and your letter to the **Vermont Environmental Report** editor for publication in the next issue. I hope that their appearance will offset any mistaken impressions that the completed ski village will look as it did on the cover of the last VER. I trust, however, that most readers recognized that the cover photo depicted construction in progress, and that it is intended to report that the implementation of large-scale development at Killington is underway. As you point out, no one expects construction to proceed without excavation, so the inclusion of piles of dirt in the cover photo cannot be interpreted as a deliberate statement about the quality of construction at Killington.

Killington Condominium

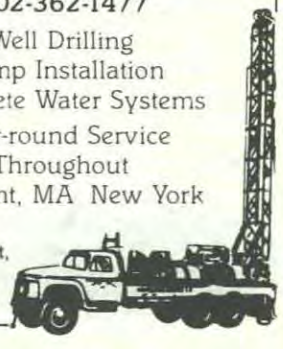
I assume that one of your questions —"When will it begin?"—refers to constructive communication between those Vermonters currently at odds over the best way of "forging opportunities for Vermont and Vermonters." I think that beginning has to consist of four points of agreement: (1) that there are both physical and desirable limits to the accommodation of traffic, sewage, power and water demands, and non-resident ownership, and that we value cooperation with each other to identify those limits; (2) that cumulative, regional, secondary, and long-term impacts are significant results of development of the type and scale currently under construction in the Sherburne area, and are to a great degree forseeable, provided adequate information is furnished by the developers; (3) that constructive communication won't happen in the hearings or in the court rooms; and (4) that we are all interested in jobs, the environment, and the future of our state, and are therefore deserving of each other's courtesy and respect.

I agree that constructive communication cannot begin until prejudice is abandoned. I share the frustration, evident in your letter, with what you see as persistent misconceptions about your organization. In this controversy VNRC, too, has been often slandered as a proponent of no further growth in Vermont, despite our long history of support for diversified, sustainable economic growth. Jobs and the environment, as we both know, are not options to be "for" or "against." Unarguably, they are necessities; the options concern the type of jobs and quality of environment that are best suited to a small, rural state with a special way of life, rather delicate soils, and an already oversimplified economy.

You also ask, "When will it end?" If you refer to the caution with which VNRC regards the physical limits of our mountain ecosystems, and the scrutiny with which we look at our choices regarding the types, combinations, speed, and scale of development in this special state, I guess the answer is never. Since the Sherburne Corporation and the rest of the recreational development industry likewise intends to continue as a major influence on the way in which Vermont develops, it will be difficult to resolve our disagreements. However, there must be a beginning to our communication and cooperation.

On behalf of the VNRC board, thank you for your letter. I hope this interchange is the beginning of a useful dialogue, and I look forward to your reply.

Respectfully,
Mollie Beattie
Chair, VNRC Board of Directors



VERMONT PERSPECTIVE

Household Toxics Collected

Does your garage house any of the following: old cans of weed killer, paint thinner, insecticide, or motor oil? In all likelihood your answer is yes, and you keep them around because you're not sure how to dispose of them.

A pilot project gave residents in the White River Junction area a chance to get rid of these kinds of household toxics by bringing them to the Hartford Fire Station on November 3.

Trained workers and a licensed hauler were present to oversee the collection of the materials which will be recycled, detoxified, or hauled to a certified waste site.

Funding for the project was provided by the Vermont Agency of Environmental Conservation in conjunction with the Upper Valley Lake Sunapee Council, the Montshire Museum, and the Upper Valley Household Hazardous Waste Committee.

The pilot project was the first of its kind in Vermont with state agency sponsorship.

According to Andre Rouleau, Solid Waste Management Specialist with the Agency of Environmental Conservation, the State has preliminary plans to sponsor additional collection projects around the state, possibly in connection with Green-Up in the spring.

"Science" Projects in Southern Vermont

Back in the 1940's, when most of Vermont was still a maze of backroads, backwoods, and farms, Aldo Leopold wrote: "The ordinary citizen today assumes that science knows what makes the community clock tick; the scientist is equally sure that he does not."

This excerpt from Leopold's "land ethic" is operating in reverse in the Green Mountains as the avalanche of resort growth continues.

Some citizens of Vermont have begun to question the "science" of resort growth. This new science is an amalgam of intensive marketing research combined with previously unavailable low interest federal bonds for development and disposable tax credits for second home buyers. The net product is the "destination resort"—designed to offer recreationists a lifestyle, not just a day on the slopes.

Few ski areas practise this science more skillfully than the Stratton Corporation, owners of Stratton and Bromley ski areas. The company is a subsidiary of Moore and Munger of Fairfield, Connecticut, whose primary business is oil and petro-chemical products.

The Stratton Corporation is in the midst of a $60 million effort to bring thousands of new people to the Stratton resort for year-round activities. Ongoing projects include a new village with a sizable condo-hotel, 600 seat conference center, 30 shops, four restaurants, 68 townhouses, a general store, 118 condominium units, and a five-level underground parking garage. The condominiums are quoted at $81,000 while the "executive townhouses" are expected to fetch up to $450,000.

"We did an extensive marketing survey to determine where the people will come from, what kind of shops they will visit, and how long they will stay," said Stratton Corporation Senior Vice President Ralph Rawson.

"The supposed windfall of economic benefits to the town will no longer guarantee a project's approval. People here are genuinely concerned about how destination resorts may change the face of this community."

To accommodate the new Village, the Stratton Corporation has drilled six major new wells for water supply and irrigation, embarked on a $2.7 million expansion of their snowmaking system, and through a new sewage plan has received permits to apply up to 475,000 gallons per day of treated wastewater to golf courses, ski slopes, and other areas through spray disposal.

Many Stratton area residents, like citizens in the Killington area, have questioned whether the local planning process should bear sole responsibility for decisions concerning growth of a magnitude that will affect towns thirty or more miles away. The town of Stratton, with 120 full-time residents, has a planning commission charged with reviewing projects that will allow for an influx of 15,000 people per day at the Stratton resort alone.

This question, as well as the potential environmental impacts, were the subject of an August meeting in Jamaica, Vermont. Representatives from the State Department of Water Resources and Environmental Engineering, the regional environmental commission, and VNRC attended.

As a result of this meeting the

Stratton Area Citizens Committee (SACC) was launched. SACC hopes to step up water quality monitoring in the upper West River basin and provide area residents with information on potential environmental impacts.

"We consider ourselves (SACC) to be an educational and watchdog organization," said Committee Chairwoman Darlene Palola. "We recognize the economic necessity of tourism to our region, however, we question how much development and wastewater our watersheds can absorb without jeopardizing public health and the mountain ecology."

The West River, noted as one of the cleanest rivers in Vermont, draws its waters from upland regions bordered by Stratton, Bromley and Magic Mountain ski areas. The West River has been targeted as one of the principal rivers for the salmon and shad fisheries restoration programs and is a favorite among fishermen, swimmers, and whitewater enthusiasts.

Although the bulk of ongoing construction is occurring on the north side of the Stratton resort, the Corporation also has its sights set on an 850-acre tract in what is known as the Sunbowl on the east side of the mountain.

"In the future we're looking at a golf course, some condominiums, and other spray disposal areas in the Sunbowl," said Ralph Rawson. "The Corporation is currently testing spray sites at the Sunbowl for potential environmental impacts to Kidder Brook."

Rawson acknowledged that wastewater disposal is the critical limiting factor in the Corporation's plans to expand into other areas, and cited the proposed Vermont Environmental Protection Rules' regulations on wastewater as unacceptable in several areas.

"There's not a piece of land in Vermont that meets the requirements in those rules," said Rawson. "The rules will restrict development..."

In nearby Peru, where Bromley Mountain is located, the planning commission has been approached three times by Stratton Corporation officials interested in altering existing zoning laws to allow for higher densities of people. Proposed projects include a 150-unit condo-hotel, 300 condominium units, and expansion of their existing spray disposal system. The Peru commission, in return, sent the Corporation a shopping list of concerns.

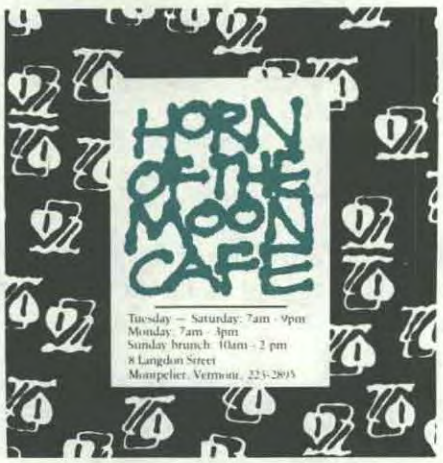
"The opportunity myth is no good anymore," said Peru town planning commission member John Shuell. "The supposed windfall of economic benefits to the town will no longer guarantee a project's approval. People here are genuinely concerned about how destination resorts may change the face of this community."

The Commission's list raised questions about sewage disposal, erosion, drainage, traffic and size of buildings. The Stratton Corporation has not yet responded, but, by all accounts, they have been cooperative in listening to local concerns.

"Their (the Stratton Corporation's) approach has been 180 degrees different from that of the Sherburne Corporation," added John Shuell. "They realize that a confrontational attitude is long and expensive and damaging to public credibility."

Until fairly recently the Stratton Corporation has managed to avoid the controversy that surrounds other major ski area developments in Vermont. The Corporation ran into snags shortly after the start of construction last spring when Department of Water Resources investigators found silt and an oil slick flowing into Styles Brook, a tributary of the West River. In late July, a fine of $6,000 was levied against the Russell Corporation, a general contractor for Stratton Corporation, for water pollution violations.

Such violations have alarmed nearby residents who, on several occasions, have complained of streams running "chocolate" and noxious odors coming from the



Corporation's treatment plant. The Stratton Area Citizen's Committee is especially concerned about the unknown implications of large quantities of spray effluent on steep slopes and shallow soils.

There is little indication that development will taper off in the Stratton area. Other developers have followed Stratton Corporation's lead and are involved in second home and condominium projects at both Stratton and Bromley. The Village complex at Stratton, originally planned over five years, is being squeezed into two years. Outside of ongoing construction at the Village and new proposals for the Sunbowl, Stratton is also planning to build a $680,000 tennis stadium to accommodate the recently acquired Volvo tennis tournament.

The magnitude of this development and its long term effects will probably not be felt for some time to come. To label destination resort growth as being right or wrong is beside the point since the trend is symptomatic of both Vermont's dependency on out-of-state dollars and the orientation towards growth that accompanies any major industry. Many Vermonters, however, are contemplating the changes that take place in surrounding communities when recreational growth overrides the fundamental character of a region.

Long-time South Londonderry resident, Martha Sonenfeld, summed it up in a local newspaper article:

"In the relatively short time since the change-over, Stratton has become Big Business, with acres and acres of condominiums, parking areas, more and more roads and just more of everything...The excuse that radical change and progress must take place is a debatable one. If a dream can be destroyed in the interest of a speculative gain for a few, what will be the effect on the future of an area?"

Aldo Leopold undoubtedly would have approved of her foresight. EP

Land Spray In Vermont: At What Price?

By Kathy Bond and Frank Reed

For most people one flush means out-of-sight, out-of-mind. But soon "out-of-sight" may be a misnomer. You might see wastewater being sprayed on the land while you're playing golf or hiking in the mountains. In the future, you might even be skiing on it. And this could be bad news for the health of our waters, forests, and people.

Many of the new developments in Vermont are geared to bringing in more and more vacationers, and these tourist dollars help bolster our economy. But sometimes the price paid cannot be measured in dollars. The influx of people is putting stress on many of the state's resources. One of the most serious problems is what to do with the increasing amount of sewage.

Much of the new building is taking place in our mountain forests where the ecosystem is fragile. Upland streams have a limited capacity to accept treated sewage without degrading water quality. And the soils in most mountainous regions are too shallow and the slopes too steep to accommodate conventional septic systems. One alternative, gaining in popularity, is to spray effluent on the land.

West Dover spray site. Photo by Don Meals.

Wastewater Uses

Land application of wastewater is not a new concept. With its nitrogen, phosphorus, and potassium, the water can provide nutrients for good plant growth, and by 1852 Germany was using it to fertilize crops. More recently, raw sewage has been used to fertilize pastureland in Australia.

In parts of the arid southwestern United States, municipal wastewater is used to irrigate crops. There, water is the most valuable component of the wastewater, not the nutrients. In more humid eastern states, sytems are designed to fertilize crops and enhance growth. Wastewater has also been sprayed on golf courses, parks, and forests.

And in Vermont...

In Vermont, twelve wastewater irrigation systems are currently in operation: Killington, Stratton, West Dover, Bromley, Haystack, Swanton, West Swanton, four state parks, and one small private system. All of the major sites are on forested slopes, and all indications are that this trend will continue. Forests, which cover 80% of the state of Vermont, can generally be acquired more cheaply than open agricultural land, and a forested site may insure the best isolation of the wastewater from human contact.

Standing water in spray field. Photo by Don Meals.

But concern has been mounting around the state because research is limited on land spray in areas with Vermont's climate, terrain and soil. And the research available suggests potential problems.

Huston Westover, a physician in Woodstock, believes there are too many unanswered questions regarding spray treatment of sewage effluent.

"I have found no research applying specifically to climate, terrain, and soil such as our Vermont environment," he lamented in an October 9 letter to Vermont Agency of Environmental Conservation Secretary, Brendan Whittaker. He points out several facts: The land is frozen for months (December through March) which include time of peak demand; vegetation utilizes effluent organic materials only during the short growing season; nitrogen is introduced in much greater quantities than can be used; open sloping and steep land is subject to substantial direct runoff; shallow topsoil and hardpan markedly destroy effectiveness; and many septic system failures have occurred in the state.

"Renovation"

When treated wastewater is applied to the land, several biological processes take place. Under ideal conditions, growing plants take up some of the water and most of the nutrients (nitrogen and phosphorus) in the wastewater. The water percolates through several feet of soil, which absorbs phosphorus and removes pathogens. When it reaches the hard pan layer, the water flows laterally until it emerges as surface water. The water that flows off the site or percolates through the soil is then considered "renovated."

Each site, however, is unique. Ability to renovate wastewater varies according to the kind of pretreatment the effluent receives, how it is applied to the land, what kind of vegetation covers the site, physical site conditions such as soil composition, slope, and climate. In other words, whether the wastewater reaches groundwater and what possible contaminants it carries depends on the interaction of several factors.

Water Quality

The quality of wastewater sprayed on the land is governed by the level of pre-application treatment. Primary treatment removes the solids or "old tires and bicycles" through a screening and filtering process. Conventional secondary treatment, using aeration and microorganisms, removes up to 90% of the organic matter, but does not significantly reduce minerals or nitrogen and phosphorus. Most treatment facilities in Vermont use secondary treatment. Tertiary treatment uses additional biological or chemical treatment and can remove nitrogen, phosphorus, and organics such as pesticides, but it's more expensive and not commonly used.

Generally, the higher the level of treatment, the less the risk of disease resulting from human contact with the waste. This is based on the assumption that the treatment plant is functioning properly, but in reality, plant failure is common. National statistics indicate that in any one year half of the plants in the country suffer mechanical breakdowns, and raw sewage bypasses occur at one-third of the plants. Nitrates, trace metals, organics, and pathogens that are not removed at the treatment plant pose threats to human health.

"The possibility that groundwater will be contaminated with nitrogen as a result of land application of municipal wastewater to mature forests certainly raises questions about the adoption of this technology."

Mineral Contamination

Some heavy metals and other trace elements that are found in sewage are essential for plants, animals and humans, but the margin between safe and toxic levels is frequently narrow.

High nitrate levels of greater than 10 milligrams per liter can be toxic to humans, and the Environmental Protection Agency has recommended that limit as a maximum for municipal drinking water supplies. High concentrations are frequently found in shallow farm and rural community wells, often as a result of inadequate protection from barnyard drainage or from septic tanks.

Fish also suffer from excess nitrogen which, along with phosphorus, causes rapid algae growth (bloom) in streams. Decomposing algae use oxygen in the water and thus deplete the supply available for fish.

Two studies have been conducted by the Vermont Department of Water Resources and Environmental Engineering to investigate effects of spray irrigation on water quality. In 1983, Douglas G. Burnham set out to determine whether land spray application of wastewater on the West Dover hillsides was affecting the quality of the water in Ellis Brook. He measured nitrogen levels both before and after water passed by the spray site. He found that nitrogen concentration increased by almost 90% as water passed the site. Burnham suggested that one explanation for these observations related directly to the **cumulative impact** of spray application.

Elizabeth Scott studied the impact of existing development and discharges on ten Vermont upland streams in 1982. She monitored two sampling stations on Roaring Brook, a stream bordering the Killington wastewater land application site. Site 1 was above the area of land application while site 2 was below the area. Several tests were performed on water samples taken during the summer of 1982. Overall, the data showed that phosphorus increased by 50%, total nitrogen by 62%, and algae more than doubled. These increases may be attributable to the land application practice. Other development could also have contributed. Many questions are left unanswered.

Potential Pathogens

Viruses and pathogens in wastewater pose potential health hazards. Some bacteria may survive several months, and viruses may persist a year or more, although little information is available from field studies on their movement through soil.

"Precise analytical methods for detecting...viruses and bacteria in groundwater are lacking," cautions I.K. Iskandar, who is a research chemist at the U.S. Army Cold Regions Research and Engineering Laboratory in Hanover, New Hampshire. "Viruses may survive most modern wastewater treatment practices, including chlorination," he adds.

Sewage spray, laden with pathogens, may be carried by the wind for thousands of feet. Thus the disposal site needs to be isolated from roads, water supply reservoirs, and all human contact.

The town of West Dover, Vermont, resorted to land spray disposal because the State prohibited discharging wastewater into Ellis Brook. The site, which began operating in 1974, consists of two sides of a hill between 1717 feet and 1600 feet in elevation. Slope on the eastern side varies from 8 to 15% and averages 25% on the western side.

J.R. Bouzoun, D.W. Meals and E.A. Cassells of the University of Vermont have studied the eastern slope of this site. Water with 150 coliform bacteria per 100 milliliters was collected in a ditch at the bottom of the slope. This amount is 30 times greater than the drinking water standard for community water supplies.

Meals points out that their results are not conclusive, and he strongly recommends that further studies be conducted to more precisely determine cause and effect.

Land treatment systems in California have measured lower levels of viruses and parasites, trace metals and trace organics in groundwater samples than were measured in the effluent sprayed on the land, suggesting that these contaminants were filtered by the soil. These systems used aerated lagoon pretreatment with winter storage of wastewater to reduce pathogen levels, low application rates, and crops grown on the sites to help absorb nutrients. These results are evidence of the critically important interplay of the particular level of pretreatment, application method, soil, slope, vegetation, and climate.

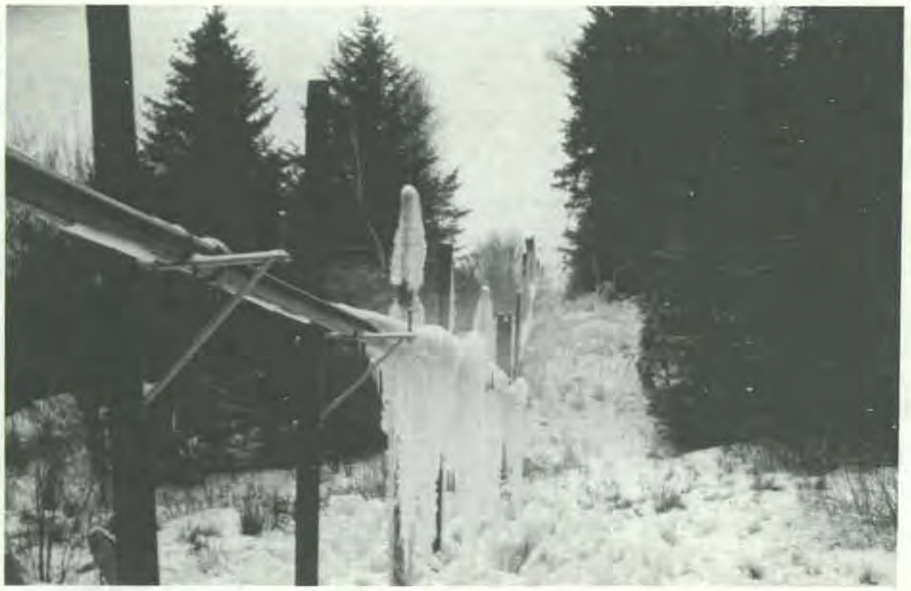
Methods of Application

How the wastewater is applied to the land will depend on geography of the site and whether the goal is to renovate wastewater, fertilize crops, or reuse the water. Water can be applied via slow rate, rapid infiltration, or overland flow systems.

Grade Suitability Factors for Identifying Land Treatment Sites

Grade factor	Slow rate systems: Agricultural	Slow rate systems: Forest	Overland flow	Rapid infiltration
0 to 12%	High	High	High	High
12 to 20%	Low	High	Moderate	Low
20%	Very low	Moderate	Eliminate	Eliminate

From E.P.A. **Process Design Manual on Land Treatment of Municipal Wastewater**, 1981.



Spray lines. Photo by Don Meals.

In slow rate application, wastewater is sprayed on the land using sprinklers, and, ideally, the plants and soil have time to absorb nutrients and filter pathogens. This method is used to fertilize and irrigate crops, and further treat the wastewater. It's also the only application technique successfully used in forest ecosystems, according to a 1981 Michigan State University review of land application projects by Frank D. D'Itri. Slow rate forest systems operate in Oregon, Washington, Michigan, Maryland, Florida, Georgia, New Hampshire and Vermont. Slow rate application results in the greatest reduction of nutrients and pathogens, and since the goal of land spraying in Vermont is treating the water to protect human health, it's the method commonly used.

Rapid infiltration of wastewater is applied to sandy soils where vegetation is not usually present. A large portion of the applied wastewater percolates to groundwater. In many cases, the renovated water is captured in underground wells and reused, as in Phoenix, Arizona where it is withdrawn for irrigation.

In overland flow systems, wastewater is applied at the top of grass-covered slopes and flows over the surface into collection ditches. Soils on these sites are relatively rocky and hardpacked. From the ditches, water is reused for irrigation or discharged to surface water.

Uptake by Vegetation

The kind of vegetation on the site affects the amount of nutrients that are removed from the wastewater. The presence of adequate ground cover is important to protect the soil from erosion and shield the surface from the impact of spray droplets which can compact the soil and reduce infiltration. Field crops and young, rapidly growing trees appear to be superior to older trees in taking up nutrients.

A Pennsylvania State University study of wastewater recycling on forest lands compared the annual uptake of nutrients by field crops with that of a hardwood forest. W.E. Sopper of their School of Natural Resources found that harvesting a corn silage crop removed the equivalent of 145% of the nitrogen applied in sewage effluent, whereas trees removed only 39%, most of which returned to the soil in fallen leaves. Similarly, trees took up only 19% of the phosphorus, compared to the equivalent of 143% absorbed by the corn silage crop.

Endel Sepp, an engineer in California, studied his state's forest sites ten years ago and observed that renovation efficiency diminished with time, possibly because the nutrients absorbed by the roots are recycled back to the soil in the leaves. He found waterlogging on the soil to be responsible for trees dying, and stressed the need for using waterloving vegetation.

After evaluating spray operations in Michigan forests on a grant from the United States Environmental Protection Agency, Thomas Burton and James Hook warn, "The possibility that groundwater will be contaminated with...nitrogen as a result of land application of municipal wastewater to mature forests certainly raises questions about the adoption of this technology. Before such irrigation becomes even more widespread...questions about whether nitrate contamination is a characteristic of certain types of forests or soil types or whether it is a general characteristic of mature forested ecosystems need to be answered."

Geographical Limitations

Geography of the site can enhance or limit the efficiency of treatment. If soils are rocky or shallow, plants and soil may not have enough contact with the wastewater to remove potential contaminants before it percolates to groundwater. Fractured rock, gravels and shallow water tables should be avoided because of the danger of groundwater contamination. Steep slopes can render a site unacceptable for land spraying because topsoil may be too shallow for water to infiltrate adequately, runoff and erosion increase with the grade, and crop cultivation is difficult or impossible. When steep slopes are saturated, the soil becomes unstable and landslides are possible. The E.P.A. designates suitable slopes for various situations, while the State of Vermont says that a maximum slope of 25% is acceptable.

Seasonal Effects

Climatic conditions can severely limit the renovating efficiency of a spray site. Rainfall, temperature, relative humidity and prevailing winds all affect the disposal process.

On a hillside with a 10% slope in Lake Tahoe, California, a land spray operation effectively reduced sewage nutrients during the dry summer season. But when the hillside was frozen the effluent ran immediately off the site. The same high levels of sewage nutrients were measured emptying into nearby creeks.

According to Sepp's study, a number of California operations have had to temporarily impound spray runoff caused by the first major fall storm. This practice prevents any pathogens that have accumulated on the spray site during the summer from being washed into ground and surface waters by the fall rains.

An alternative to impoundment, Sepp suggests, is to provide a rest period of at least 2-4 weeks of dry weather after spraying is stopped. Studies on farms in Texas and California showed that when the crops weren't actively growing and using nitrogen, it leached to groundwater. Consequently, storing the effluent during winter months was recommended.

In a forest, continuous irrigation maintains high soil moisture and encourages shallow tree root systems. In Pennsylvania, these conditions led to blow-down following a heavy snowfall and strong winds. Spraying wastewater in cold weather can also cause ice buildup on evergreens, breaking or uprooting them.

More Answers, Please

The pressure to accommodate new growth in Vermont is high, especially in upper elevation forests, and it is finding an outlet in conventional secondary treatment coupled with land application. Currently, the Sherburne Corporation intends to apply 100,000 gallons per day (gpd) to a site known as Bear Mountain, while Sunrise Corporation intends to spray at two sites—the Gondola and Area F, for a total of about 100,000 gpd. More sites are being considered at Magic, Ascutney, Stratton, and Bromley mountains.

The Vermont Environmental Protection Rules govern land spray projects, and the Department of Water Resources and Environmental Engineering administers the rules by reviewing potential projects, and issuing permits. These regulations address such factors as slope of land (maximum of 25%) and the presence of a hard pan layer a few feet beneath the surface to favor subsurface lateral flow rather than deep percolation to groundwater. This impeding layer is supposed to be continuous across the entire spray site.

The Connecticut River Watershed Council, VNRC and other conservation groups in the state are urging careful examination of the potential impacts of spraying wastewater on these sites. They raise questions about some of the proposals and believe that the Sherburne and Sunrise sites do not conform to the Environmental Protection Rules regarding slope and a continuous subsurface impeding layer.

The environmentalists caution that while land spray of wastewater may work effectively in other parts of the country, we do not know enough about the suitability of Vermont's soils and forested slopes for such a practice. As long as there are questions regarding effects on public health and our natural resources, we should not see land spray as the automatic green light to developers who cannot get permits to discharge treated waste directly into our rivers.

(As this magazine goes to press, the Department of Water Resources and Environmental Engineering is working on changes to the Environmental Protection Rules that address land spray of wastewater on forests, golf courses, and ski slopes.)

Frank Reed is Director of the Connecticut River Watershed Council and Chairman of their Technical Advisory Committee.

Land Treatment Methods and Concerns

Potential Concerns	Slow Rate	Rapid Flow	Overland Flow
Nitrogen			
Health: drinking water aquifers	X	X	—
Environment: crops	X	—	—
eutrophication	X	X	X
Phosphorus			
Environment: eutrophication	X	X	X
Dissolved solids			
Health: drinking water aquifers	X	X	—
Environment: soils	X	X	X
crops	X	—	X
ground water	X	X	—
Trace elements			
Health: drinking water aquifers	X	X	—
crops	X	—	X
Environment: crops	X	—	—
animals	X	—	X
Microorganisms			
Health: drinking water acquifers	X	X	—
crops	X	—	X
aerosols	X	—	X
Environment: animals	X	—	X
Trace organics			
Health: drinking water aquifers	X	X	—
crops	X	—	—

An "X" indicates the possibility for concern. From E.P.A. **Process Design Manual on Land Treatment of Municipal Wastewater**, 1981.

"Mongswa" Returns

by Eric Palola

"Champ's" dominion over the hearts of Vermont monster fans may be challenged by a more visible colossus—the New England moose. The shy Champlain monster would probably shed scales at the sight of a half-ton bull moose wandering along its watery sanctuary.

"It's really exciting," commented Montpelier resident, Tom Carpenter, after witnessing a cow moose with two calves make their way through the brush near Lake Elmore. "We're used to seeing deer in Vermont but this is real wild stuff by comparison."

"Mongswa" or "twig-eater" (the Indian name for moose) has been making a remarkable comeback in New England in recent years. In Maine alone there are now an estimated 20,000 moose thriving in the swamps and spruce forests where there were only 2,000 fifty years ago. In Vermont, the numbers are more modest, perhaps only two to three hundred, yet the sheer exhilaration of moose sitings has added a new dimension for Vermont wildlife enthusiasts.

Moose are the ultimate in foraging machines. Standing up to eight feet tall at the shoulder, these nonstop nibblers pause only for the annual fall rutting season. In the winter, moose browse on shrubs and young saplings. To fulfill their summertime 40-60 pound per day diet, moose take to the rivers and swamps to harvest succulent shoots and pond weeds.

Curiously, the habits of men, originally responsible for the decline in moose populations, have more recently enhanced their return. The clearcutting of large tracts of softwood forest has restored the immature vegetation moose prefer. These cutover tracts also discourage wintering deer herds who are ill-equipped for deep snow travel and prefer less exposure.

The relationship of deer to moose, however, is more than one might first expect. In a unique biological connection, deer play host to a miniscule worm that is transmitted to the moose through normal intermingling of moose and deer habitats. This parasite, known as the "brainworm," is harmless to deer. However, when introduced to moose, the worm travels to the central nervous system causing confusion and eventual paralysis. The "brainworm" is often the culprit of many moose stories where the afflicted beasts are observed wandering aimlessly, sometimes blinded

...apparently gone mad.

"Moose populations are directly linked to the deer herd size in Vermont," says Charles Willey, a biologist who heads the Vermont Department of Fish and Wildlife's moose studies. "The moose have fared well in Vermont even though a large priority is placed on encouraging the deer herd for sportsmen." There is no current plan for managing the moose herd according to Willey, although he noted that the fall doe season will benefit the moose herd.

A five year study, now in its second year, is being conducted to determine the health and age of the herd along with the potential for a hunting season. As part of the study, reproductive tracts and brain samples are regularly sent to the Northeast Disease Center at the University of Connecticut. The majority of the 23 moose deaths catalogued last year were due to roadkill. Additional deaths resulted from poaching and dog chases.

"We're gathering a lot of data," added Willey. "Our efforts reflect the renewed public interest in the vitality of the moose herd."

The Vermont hotspots for moose encounters are in Essex County and in isolated pockets along the Green Mountain range. By all accounts the sight of an adult moose is "awesome," yet sightseers should be reminded of the animal's potential belligerance.

The future of the moose in Vermont will rest almost entirely on deer herd management practices. For now, we are assured of a fairly stable population of these terrestrial Goliaths. "Champ" will have to upgrade his performances as well as their frequency if he wants to retain the attention the moose in Vermont are now enjoying.

Eric Palola is a temporary staffperson at VNRC working on issues.

Banquet Celebrates VNRC's "20th"

VNRC's 20th Anniversary Celebration at Vermont Technical College in Randolph was a brilliant exception to the usual banquet fare of high carbohydrate speeches, warmed-over humor, and sugar-coated self-congratulation. From the first course, the menu for the September 8 gathering was a heady mixture of extra dry wit, well-seasoned advice, and bittersweet reminiscences.

Dick Hathaway surpassed himself (a remarkable feat!) as emcee, directing his remarks to an organization he described as "not quite on the edge of being fat cat and well satisfied."

For appetizers, there were introductions of "the greats, the semi-greats, and the well-intentioned." It was extremely heartening to see so many present and former VNRC directors, charter members and life members in the audience. Perry Merrill, Dick Brett, Justin Brande, Kit Foster, Hugo Meyer, Bernice Burnham, Dave Marvin, Bill Eddy, Sylvia Ferry, Jonathan Brownell, David Firestone, Patsy Highberg, Jim Wilkinson, John Holden, Deane Davis and Paul Heald were among the Very Special VNRC People who took a bow. There were scores of others who because of the packed agenda didn't get their deserved adulation or floor time, but who enriched the evening by their presence.

"Teach the people first, and the legislature will follow."

Deane C. Davis

Some folks made remarks, like former VNRC chairman Dick Brett, now 81, of Woodstock. Brett spoke softly, but his message was clear: "I want you to take a new direction," he said. "We must at the very least demand that a watershed be regarded as a unit and that people not damage the rights of others to have breathable air and potable water."

Former VNRC executive director, Justin Brande seconded Brett's motion and called for more long-range planning and a shift away from the emphasis on "putting out brush fires."

Jim Wilkinson charged that "technological fix is becoming the dominant religion of our society," and challenged VNRC to use its memories of the past to "mold, gird, channel and give meaning to its continuing search for answers to questions about how, where and especially why our natural resources must be conserved."

The main course began with a brief speech by Lieutenant Governor Peter Smith. Smith talked about the difficulty of being both an advocacy and an educational organization, but came down firmly on the side of education. "If you give the legislators the facts, they will do what needs to be done," he said.

Several other "pols" were conspicuously present at VNRC's 20th Anniversary Banquet, including gubernatorial candidate Madeleine Kunin, attorney general hopeful Bruce Lawlor, state Senators Arthur Gibb and William Doyle, Senate candidate Will Hunter, and Representative Wayne Kenyon.

A succession of champagne toasts followed the drawing for the Hearthstone III woodstove, which was won by former board member Francis Whitcomb of Glover.

Dick Hathaway christened VNRC operations director Don Hooper "the Clown Prince of the State of Vermont," and Hooper fired back by thanking Ronald Reagan for "ample material to work with."

VNRC chairperson Mollie Beattie praised outgoing executive director Seward Weber for "directing VNRC's growth from seedling to full flower," and presented a hoe and a spade to the man "whose green thumb has kept a whole state verdant."

Singer/songwriter Dick McCormack of Bethel provided several musical interludes, including his plaintive "Voices in the Hills." But the highlight of the program was the premier performance of "One With the Land," a song he composed in honor of VNRC's 20th anniversary.

Early in the evening, Dick Hathaway pronounced that the event would end promptly at 9:15 "unless we're having a good time." The appointed hour came and went with nary a squirm or a stifled yawn from the audience of more than 200.

Their persistence was rewarded with a memorable speech by former Vermont governor and guest of honor, Deane C. Davis. Davis, who was on hand to accept a Citation for Outstanding Service to the Environment and the State of Vermont," claims that he has received "altogether too much recognition" for shepherding Act 250 and other landmark environmental legislation through the 1970 General Assembly. He attributes the victory to a successful educational process that began with the people of Vermont. "Teach the people first, and the legislature will follow," he counseled.

Davis concluded his remarks with an outspoken defense of Act 250. "There is no greater myth...than the contention that Acts 250 and 252 are so drastic that they set back industrial development in Vermont," he said. In the seven years following the adoption of Act 250, industrial development exceeded growth during the previous seven years in every category measured, according to Davis, and this trend has "continued and increased" during the past six years.

For dessert, there was a stem-winder by former VNRC chairman and orator-in-residence, Carl Reidel. The mood of the evening, however, was perhaps best captured in the final two verses of Dick McCormack's stirring "One With the Land:"

When entrepreneurs grow careless and bold
Giving portions of poison for portions of gold
With no sense of the worth of what's bought and what's sold
They forget that they're one with the land.
So parents beware that your daughters and sons
Will live out their lives with what can't be undone
Benign or malignant, all we'll have done
We'll have done as one with the land.
MM

New Directors Elected

VNRC welcomes three new directors, elected at the Annual Meeting in September, who will join the Board in January.

Patricia Highberg rejoins the Board of Directors after a year's absence. Patsy's commitment to environmental concerns was a hallmark during her earlier terms.

David Brook of South Royalton, a student at Vermont Law School, has a background in water resources and hazardous materials with the State of New Jersey. David worked full-time at VNRC last summer on water issues, and we still benefit from his energy and expertise one day a week.

John Hemenway of Milton, Massachusetts, was nominated by the Vermont Timberland Owners' Association to be their representative on the Board. He directs the New England Forestry Foundation, and owns forest land in Vermont.

The following incumbents were reelected. **Larry Forcier** of Charlotte, director of the School of Natural Resources at the University of Vermont, serves on the VNRC Land Use Committee. **Sarabelle Hitchner** of Craftsbury is on the faculty of Sterling College and active on VNRC's Development Committee.

David Jillson of Essex Junction, is Senior Biostatistician at the Vermont Health Department in Burlington, and heads VNRC's Land Use Task Force. **Richard Mixer**, Hanksville, maintains a planning and engineering practice and serves on VNRC's Planning, Finance, and Executive Committees.

William Uptegrove of Jamaica, who was nominated by the Green Mountain Club, was re-elected. Bill, a retired city planner, represents his town on the Windham Regional Planning Commission, and serves on VNRC's Planning Committee.

The Council is fortunate to have such experts and activists on its volunteer board.

The Council gratefully acknowledges memorial gifts in honor of Lucy Bugbee from the following individuals: Carl and Mary Krogh, Mary Louise Mehrtens, Ray and Christina Clark, Edmund Friedrich, and Elizabeth L. Clarke.

What's Your Environmental Attitude?

Eighty percent of the Vermonters surveyed recently by VNRC said they were willing to pay higher consumer prices and taxes to protect the environment. Seventy-five percent said conserving the state's natural resources for future generations was more important than using them now.

The survey was developed this past summer by Yale University graduate student and VNRC intern, Fred Linthicum. He conducted the telephone survey in the name of the Yale School of Organization and Management to avoid influencing survey results.

Partial funding was provided by a Yale Management School internship program and the Rockefeller Brothers Fund.

The survey goals were to compare environmental attitudes and priorities of the general public and Council members, and to assess how both groups feel about the activities and effectiveness of VNRC.

Three hundred people, half members and half non-members, kindly took the time to talk with Fred or one of several other volunteer interviewers.

There were only slight differences between the environmental attitudes and priorities of the two groups, although 35% of the general public had never heard of VNRC and its environmental protection work, and 43% of those who had thought it was a state agency.

More than half of the members polled favored a slower pace of economic growth to protect the environment. Forty-eight percent of the non-members said they would accept slower growth, and 41% thought growth and environmental protection could be achieved at the same time.

About half of both members and non-members believed that Vermont has about the right amount of

state regulation over land use and development.

Toxic, hazardous and nuclear wastes, and reducing air and water pollution were topics of greatest concern to both VNRC membership and the public.

One area where members and non-members differed strikingly was the issue of rapid expansion of ski resorts into four-season destination resorts. Fifty-two percent of the non-members said it was a "significant issue" contrasted with 89% of VNRC members who called it "significant."

Of the members polled, 49% were 60 or older, none were younger than 24, 29% were 25-39, 22% were 40-59. Seventy-six percent had lived in Vermont over ten years, compared to 81% of the non-members surveyed.

Turning to the area of member satisfaction with the Council's activities, 69% felt VNRC is aggressive enough in pursuing its objective of environmental protection. Educational, lobbying, and publishing activities topped the list of member priorities.

VNRC thanks all of the participants for their help.

Water and the Law

The 1985 Vermont Environmental Law Conference, highlighting water issues in Vermont, will draw experts from the University of Vermont, the State of Vermont, the Environmental Protection Agency, nationwide environmental groups, and private industry.

Sponsored jointly by the Vermont Law School and VNRC, the November 30 conference will dip into water quality and water quantity issues in morning plenary sessions. Participants will get their feet wet in early bird seminars on fisheries restoration, water regulation systems, water rights, and a hydrological overview of Vermont.

The real dunking will take place during the afternoon workshops on wastewater treatment, groundwater, upland stream protection, recreational uses, hydropower, and Lake Champlain.

Brent Blackwelder, Director of Water Resources for the Washington-based Environmental Policy Institute will give the keynote address. He is Board Chairman of the League of Conservation Voters and the American Rivers Conservation Council.

Hopefully, by the time you are reading this, the muddy future of our state's waters will be cleared up.

A Few Words for Marion MacDonald

Marion MacDonald has a way with words. After nearly five years as editor of the **Vermont Environmental Report**, she's a pro at turning tidbits of words into a literary main course—hearty, bubbling with humor, and easy to digest.

She recently left VNRC to pursue her own editing and graphic design business, "Words In A Row."

Marion wrote several booklets for VNRC, including **What's Going On Down There**, which is about Vermont's groundwater. She produced bulletins, press releases, and fundraising letters, and testified for the Council on various issues.

With her flair for excelling, she was named "Young Careerist of the Year" in 1982 by the Montpelier Business and Professional Women's Club.

Her specialty now is writing and designing booklets, brochures, and promotional materials. If you have these needs, look her up in Morrisville. We miss her. Her shoes will be hard to fill.

Marion MacDonald

Agricultural Vitality on VNRC's Agenda

A position statement by VNRC's ten-member Agricultural Vitality Task Force outlines concerns and recommendations for Vermont's agricultural future. It will help guide VNRC's legislative efforts on farmland bills and taxation proposals in the upcoming legislative session.

The statement emphasizes the need to enhance the economic returns to agriculture through tax stabilization, better marketing, and measures to reduce local town budget demands on property taxes for schools and services.

Another recommendation favors farming techniques that utilize

sound environmental practices such as responsible use of pesticides, soil conservation, and erosion control. The policy recognizes the strong impact of national farm policies and legislation such as the Agricultural Productivity Act, the 1985 Farm Bill, and other USDA pricing strategies for the dairy industry.

Specific policies are included in the position statement on the Current Use Tax Program and the right of farmers to prohibit utility companies from using herbicides on their land. The Current Use program, which has seen significant new farm enrollments this year from statewide property reappraisals, is now under study by a joint legislative committee. Herbicide use on utility rights-of-way was strongly debated in the last legislative session as environmentalists sought to give landowners the right to request alternatives to herbicide spraying on utility easements.

Copies of the agricultural position statement were sent to all major candidates running for state office this year, and they are available on request from VNRC.

In the article, "VNRC: The First Twenty Years, Part II," that appeared in the summer edition of the **Vermont Environmental Report,** a $25,000 gift to the Council was mentioned as forming the basis of a permanent endowment fund. The correct amount was $250,000.

Linda McKone

New Waves in the Office Pool

Along with the major change of a new executive director, there have been several other staff transitions. Marion MacDonald moved on to greener pastures with her own business and Kathy Bond assumed editorship of this issue of the VER. Dorothy Fredrickson left her job as membership secretary to take a job with The World newspaper. These changes created a need for new staff, so the Council has latched onto two capable people who first walked in the door as volunteers.

Eric Palola proved himself an effective communicator and hard worker last winter when he volunteered full-time at VNRC on the current use tax assessment program and farmland issues during the 1984 legislative session. After a summer with the Lay Monitoring Program at the Department of Water Resources, Eric joined up for another tour of duty as a paid temporary staffperson to work on issues. He organized the 1984 Environmental Law Conference mentioned elsewhere in **Council** notes.

Linda McKone came into the office one day to offer her time and water quality expertise. Two weeks later, she joined the staff temporarily to handle membership activities, and share her artistic and organizing skills.

Eric and Linda share the spirit and energy that the VNRC staff thrives on. We thank them!

Thanks to Outgoing Directors

Two directors will be leaving the Board in January, and they deserve many thanks for the time and energy they have devoted to VNRC. **Bryce Thomas** of Newbury served for three years on the Forest Policy Task Force. **Monty Fischer** of Montpelier, a director for the last six years, gave the Energy Committee a lot of the same. The staff hopes that he will visit if their spirits are ever downtrodden, and lift them with his infamous laugh.

New Members

VNRC is pleased to welcome the following members who joined us during July, August, and September: Katie Crane, Mrs. Benton Dryden, Jane Lancaster, Mr. James Bock, Elnora & David Fadden, Frances Uptegrove, Peter Branhall and Candiss Ann Cole, Robert W. Hardy, C.P., Mr. and Mrs. Allan Harvey, Mrs. Perry O'Toole, Keith Shortsleeve, Dr. and Mrs. John S. Thompson, Mr. and Mrs. William Mayer, Mrs. M.J. Smith, Bill, Barbara and Andy Ackemann, Mr. and Mrs. John Young, Debra A. Ladd, Jean Stubbs, Ben Gardner, Joseph Adams, Carolyn and Bill Meub, Mr. and Mrs. Curtis Bourdan, Jane E. Mack, Geoffrey Beyer, Ed B. Jalbert, Fred D. Merkert, Mr. Adrian A. Paradis, Margaret Pelletier, Laurence Ballou, M.D., John H. Carnahan, Harry W. Clark, Jr., Joseph M. Mascia, Bette Godfrey, Jannice Worby, Adelaide T. McMurrer, Edith R. Kent, Brian Fisher, J. Huston Westover, Mrs. Gerry Cohen, Mr. Christopher Kiley, Allison Reisner, Mr. and Mrs. Thomas T. Richmond, Alan Perkins, Donna Gene Parker, Dr. and Mrs. Thomas C. Bates, Albert D. Conwell, David S. Strong, Mrs. Katherine R. Hodges, Edward M. Kane, Mr. Hal Boardman, Kate Baldwin, Charley and Lynn Parker, Jean Stewart, Stephen and Ellen Saltonstall, Jens T. Jensen.

We're Beholden to the Holdens!

By Marion MacDonald

I've been a member of John and Polly Holden's fan club for years. At 77, Polly has enough energy and enthusiasm for three people. And it's a good thing, because last year she celebrated 50 years of marriage to A. John Holden, Jr.

A word of caution: Don't ask John Holden to tell you the story of his life in 45 minutes. Among his recent credits are eight years on the VNRC board, a stint as president of Lyndon State College, six years as chairman of the District 5 Environmental Commission, two years as director of the New England Regional Educational Laboratory and numerous appearances in local theater productions.

And did I mention that all this has been since John's "retirement" (the first of many) in 1965?

I interviewed John and Polly Holden recently at their home near Adamant on the occasion of John's 84th birthday. I was entertained most graciously in their 140-year-old farmhouse that has been home base for the Holdens since 1933. They purchased the house and one acre of land when John was the master of a one-room school on the County Road in East Montpelier.

But John Holden was no ordinary country schoolteacher. Harvard-educated, he switched from engineering to education shortly before graduation. He taught at a manual training high school in Louisville, Kentucky, and a Latin school in Roxbury, Massachusetts, before realizing his dream of directing a one-room school in his home state of Vermont. Holden taught first at Maple Corner, then at the one-room school down the road.

In 1936, he returned to Teachers' College at Columbia University and finished out his Ed.D. as Superintendent of Schools in Danville, Vermont, with a project entitled "Helping Rural Teachers Grow." After seven years in Danville, Holden taught physics and education for four years at Middlebury College and served as Coordinator of Field Services at Genesee College in New York.

John is best-known for his subsequent assignment: Commissioner of Education for the State of Vermont, a position he held from 1949 to 1965.

"It was my life," says John, and Polly concurs, describing her husband as a dedicated public servant who eschewed business lunches, expense accounts and other indulgences at the taxpayers' expense.

Polly herself has a long association with progressive educational institutions. After graduation from Smith College and Catherine Gibbs Secretarial School, Polly was secretary to the President of Bennington College during its inaugural years, where she shared in the excitement of the construction of campus buildings and the gathering of faculty members and staff.

Polly returned to work in 1959, when the Holdens' four children were grown, first for the "Little Hoover Commission" under Fred Mehlmann's direction, and then for the Goddard College Adult Degree Program. She helped set up a program in Canadian-American relations at Goddard.

The Holdens' history of environmental activism seems to date back to the first Earth Day in 1970. Polly organized conferences at Lyndon State College on solid waste disposal, natural foods, and other topics.

"Some time around then was the first time I remember hearing of

VNRC," John recalls. VNRC executive director Justin Brande, a friend of the Holdens, asked John if he'd be willing to take a VNRC slide show to school groups around the state.

"I only remember one presentation I did," John chuckles, "and that was at a junior high school in Randolph. One of the slides was of Colchester Bog, telling how you could learn a lot of important things from a bog. And so naturally one of the kids asked me 'what can you learn from a bog?' And I didn't know a damn thing about it!"

But he learned quickly, becoming a member of VNRC, and serving on the VNRC board longer than any other director. He was treasurer of VNRC from 1980-1981, and received the Council's "Citation for Outstanding Service to the Environment and the State of Vermont in 1981."

John and Polly have also been enthusiastic promoters and fundraisers for VNRC. Still John insists that he doesn't understand why he and Polly ought to be featured in a column like "Resource People."

VNRC Operations Director, Don Hooper provided a partial answer to that question when I asked him about the Holdens:

"John and Polly Holden are such thoughtful, sensible, and respected people that having their unequivocal support lends credibility to the organization and everything we do," he said.

Recalling John's term as treasurer, Hooper said that his frequent presence in the office "did a tremendous amount to shore up flagging enthusiasm." And more than that, the Holdens have been able "to do in practice, through the way they live, what we do in theory and in law downtown." They represent, in Hooper's words, "the best of the conservationist mentality and commitment"—living on the land simply and carefully, and making sure the next generation will be able to do likewise.

Marion MacDonald, past editor of this magazine, now operates her editing and graphic design business, "Words In A Row" in Morrisville.

CHAMP: Reptile or Ripple?

by R. Montgomery Fischer

Champ—Beyond the Legend, by Joseph Zarzynski. Bannister Publications, 1984, $8.95 softcover, $16.95 hardcover.

What's all this foolishness about anyway? Lake Champlain has **what** living in it? A monster called "Champ?" Facts are difficult to come by when writing about Lake Champlain's mysterious resident. Opinions, lots of opinions, and sketchy evidence abound. And all of it—facts, opinions, and evidence—are finally drawn together by Joseph Zarzynski in a single non-fiction volume.

Let me say at this point that I have never seen Champ. I will admit that for some 15 years I have kept my eyes wide open whenever on the sparkling waters of Lake Champlain, but, alas, nary an unexplained ripple. This may be the very reason why Mr. Zarzynski's book intrigues me so much. Everyone else's sightings are documented and summarized in it! Whether you believe, don't, or just aren't certain, this book will surprise you with its thoroughness and attention to detail.

Mr. Zarzynski, who teaches 9th grade social studies in Wilton (Saratoga County), New York, has worked diligently since 1974 to prove or disprove a legend that has endured since before Samuel de Champlain first set eyes on the lake in 1609. Whether it be researched folklore, lake names such as Big Snake Bay, or 224 eyewitness accounts of sightings, the author, through his words and over 70 illustrations, builds an irrefutable case. Many responsible people over the last several centuries have seen something in the lake. What makes this case even more plausible is the startling 1977 photograph taken by Sandra Mansi, which appears in the book. This photograph, showing the head and neck of an aquatic creature, has been analyzed by dozens of photo interpreters and other experts, with the unanimous conclusion that the photograph is real—no touch-ups or artificial tampering whatsoever.

Comparisons between Lake Champlain's Champ and Loch Ness' Nessie are tantalizingly drawn by the author. There appear to be striking similarities between these two bodies of water and the elusive creatures which may inhabit them. This book follows the trails blazed by Rupert Gould in his 1934 book, **The Loch Ness Monster**, and by Constance Whyte in her 1957 book, **More Than A Legend**.

In 1983, Champ was spotted on 24 separate occasions, with five sightings reportedly to be of at least two aquatic creatures at the same time. Mr. Zarzynski postulates that Lake Champlain may be the home for many "Champs" which have previously been lumped together under a single name. With his book now in print and being widely circulated throughout the region, more and more people are likely to come forward with relevant unexplained sightings. Maybe, just maybe, someday I'll have a reason to do so also!

R. Montgomery Fischer is a member of VNRC's Board of Directors and Vermont Chairman of the Lake Champlain Committee.

Photo taken on Lake Champlain by Monty Fischer.

BOOKS

A Montpelier audience was delighted last winter with a performance by reknowned folk musicians Malcolm Dalglish, Grey Larsen and Shelburne native, Pete Sutherland. One of the highlights of the program was Sutherland's "Monster," a musical tribute in three-part harmony to Vermont's unofficial state mascot. Pete granted VNRC permission to reprint the words.

("Monster" © 1983 by Pete Sutherland. All rights reserved Tarquel Music, BMI)

Just a half a mile from Champlain's shore
Three hundred feet deep—or maybe more
Or maybe four,
Lives a creature so elusive
So completely unobtrusive
That the only name that seems
to suit him is...MONSTER!
He died out in the Pleistocene era
Or so the history books say
His fate like all of his kind—
a watery grave
But stop and consider the chances
Of one gargantuan whatever-it-is
Swimming far away from his herd
Getting trapped in some freshwater lake—
But that's absurd!
No it's not!
Do you really believe that a
Beetle-brained reptile three million years old
That's as big as a two-car garage
Could be frolicking under your sailboat?
Diving-diving-diving-diving DOWN
Down on the bottom
Three hundred feet down
Or maybe only two!
Maybe only one hundred
feet down and RISING...
Soon it will surface and breathe air
And when it does we will be there
FISHING!!
No way—
It's a snake, it's an eel,
it's a school of sturgeon
some snorkler
It's a railroad tie, it's a telephone pole!
wrong number
It's a Russian sub, it's a rubber ducky
some swamp gas
Gimme any old line, I'll swallow it whole!
It's sunlight playing on the water
I've swum in Lake Champlain
since I was a little bitty kid
And he never has seen NO MONSTER
Please, monster, don't come out!
No way—can you prove it?
The New York Times ran a photo last year
Completely authentic—they swore
It showed the head and the neck,
it showed nothing more!
I'll tell you I stared at that
picture for half an hour
And I couldn't find any resemblance
to sturgeon or snake
So draw any conclusion you want
The thing was a fake!
Ha! It's a pretty deep lake—
You could drop the whole city
of Burlington in,
and have room for Plattsburgh as well
There's plenty of room for a
peace-loving monster to dwell!
Please monster don't come out—
It's nice to know there's **something**
We know **nothing** about!

CALENDAR

December 7, 10 a.m.

The Center for Northern Studies in Wolcott will sponsor a lecture on **"Morphodynamics of Glaciated Shoreline Beaches,"** by Dr. L. Kenneth Fink, Professor of Oceanography, University of Maine at Orono. For more information call 888-4331.

December 11, 7:30 p.m.

The Cold Regions Research and Engineering Laboratory in Hanover, N.H., will be open to the public for a one-hour tour sponsored by the Montshire Museum of Science. The Lab studies a variety of problems associated with cold regions including transportation, construction and energy conservation. Call the Museum in Hanover at (603) 643-5672 for more information, or meet at the Lab at 72 Lyme Road.

December 27

The Vermont Institute of Natural Science will sponsor a **Christmas Bird Count** in Woodstock. Call 457-2779 for information on participating.

December 28, 7:30 p.m.

Owls of Vermont will be the subject of a program at the Vermont Institute of Natural Science in Woodstock. Sally and David Laughlin have raised and cared for orphaned owls and will let you take a close look at five residents of the Institute: saw-whet owl, screech owl, barn owl, barred owl, and great-horned owl. $2 for members and $2.50 for non-members. Call 457-2779 for more information.

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One With The Land

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We live in the ruts of a long glacial spring
The scars on the land that millennia bring
The tracks of some gigantic wild ancient thing
That make us all one with the land

Water that percolates sparkling and cold
Water that splashes and water that rolls
Water that waters our bodies and souls
And makes us all one with the land

The trees of our fires and our walls have long stood
In the depths and the darks and the smells of the woods
And inform us some things are transcendentally good
And that we're all one with the land

Echoes of geese where the gaggles have flown
White tails in families and wild cats alone
Brothers and sisters in blood and in bone
And all of us one with the land

When entrepreneurs grow careless and bold
Giving portions of poison for portions of gold
With no sense of the worth of what's bought and what's sold
They forget that they're one with the land

So parents beware that your daughters and sons
Will live out their lives with what can't be undone
Benign or malignant, all we'll have done
We'll have done as one with the land

Chorus:

One and all are all one with the land
Our foot paths are humble
Our mountains are grand
Each summer the wild berries
Bleed in our hands
And christen us one with the land

Vermont Natural Resources Council
7 Main Street
Montpelier, VT 05602

Address Correction Requested