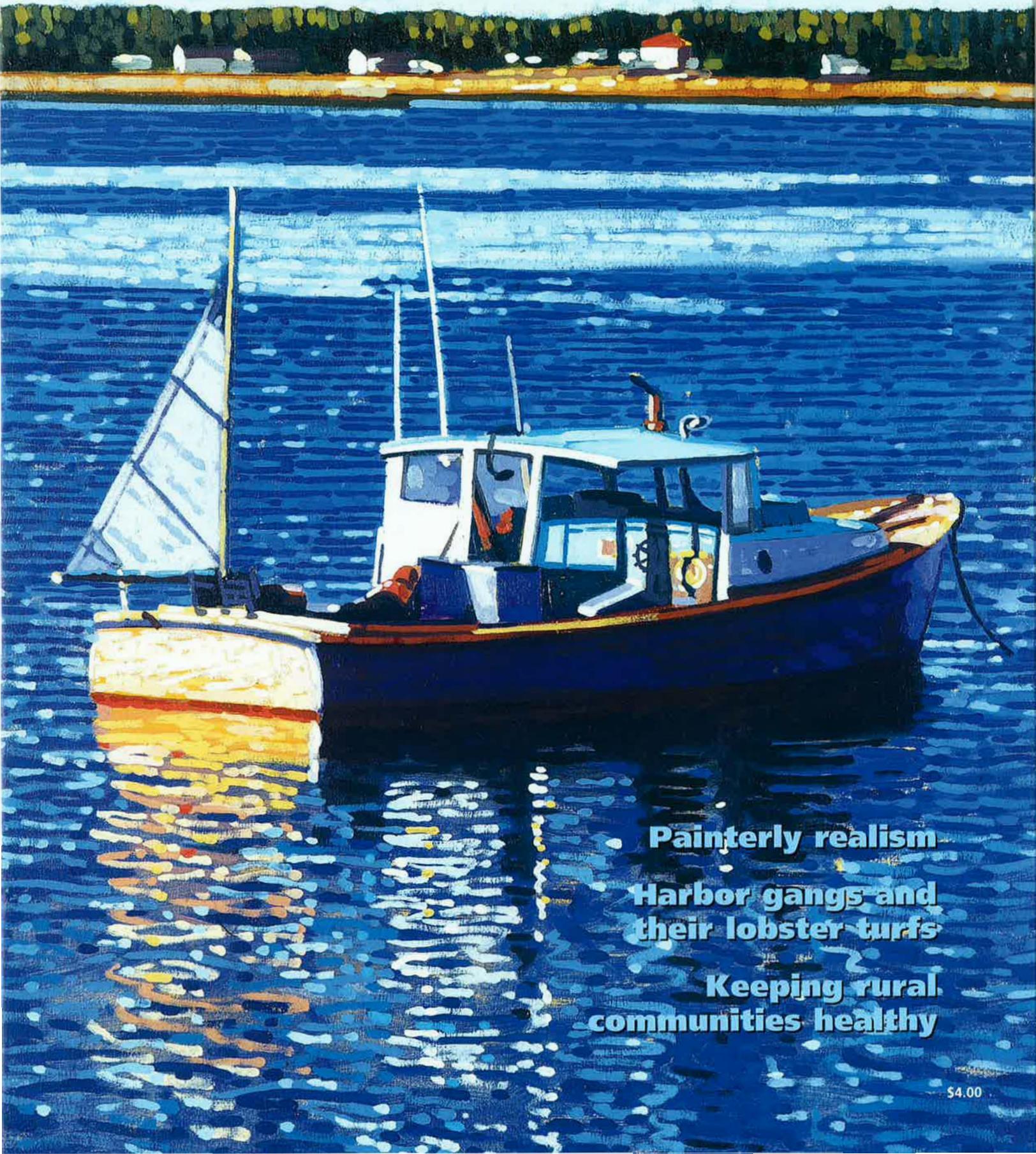


UMaine Today

CREATIVITY AND ACHIEVEMENT AT THE UNIVERSITY OF MAINE

JULY/AUGUST 2003



Painterly realism

**Harbor gangs and
their lobster turfs**

**Keeping rural
communities healthy**

\$4.00

From the President



Photo by Gabor Degre
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ONE OF THE HIGHLIGHTS of the 2002–03 academic year occurred in May, when former Canadian Prime Minister Brian Mulroney visited the University of Maine to deliver the fourth installment of our prestigious William S. Cohen Lecture Series. His address on the state of Canadian-American relations, speaking as one who has influenced those cross-border ties as much as any national leader in recent history, deeply impressed those of us in attendance.

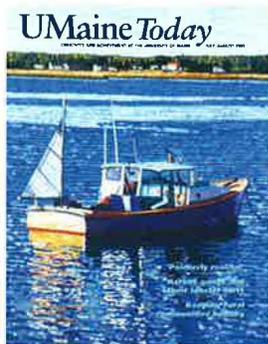
In the days and weeks since the lecture, many people have let me know that the event made them proud to be associated with a university that is in a position to offer a program of such quality and importance. It was a stellar example of the sort of event that connects a university with its constituents — in our case, the people of Maine.

Mulroney's lecture also served to amplify once again UMaine's special relationship with former Secretary of Defense Bill Cohen. A Bangor native who once served on our faculty, Cohen is one of the most distinguished public servants in Maine history. We are grateful for his work with our William S. Cohen Center for International Policy and Commerce, and his decision to make UMaine the home for his archive.

With Secretary Cohen's guidance, and the leadership of Dean Daniel Innis in UMaine's College of Business, Public Policy and Health, the center is establishing itself as a vital player in Maine's economic development policy structure. Earlier this year we announced that significant portions of the Cohen archive are now open to researchers and others interested in Bill Cohen's remarkable public career.

Events and connections like these are a reflection of the vital role that UMaine plays in bringing high-profile, global discourse to our state. More examples of the university's extraordinary contributions — like the art of James Linehan, the dedicated training in the Rural Family Nurse Practitioner Program, and the research of cultural anthropologist James Acheson — may be found in this edition of *UMaine Today*.

Peter S. Hoff
President



ON THE COVER: James Linehan's landscape paintings are "meditations of a sort," capturing natural, often out-of-the-way settings most familiar to those who call Maine home. (Story on page 11.)

The Sea Chimes 1995, oil/canvas, 30"x30," Private Collection.



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features

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For more than a quarter-century, anthropologist James Acheson has studied the age-old self-management strategies of Maine's lobster industry. From the unmarked yet well-defined lobstering territories to the unspoken yet ever-present culture of resource conservation, the traditional model has the potential to inform other fisheries now in crisis.



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6 On the Trail of Maine's Ice Age

As the Ice Age ended almost 14,000 years ago, glaciers moved through Down East Maine, leaving scars on the landscape that are still visible to the trained eye. Now a UMaine geologist wants to share with the public the scientifically and historically significant evidence of the deglaciation trail.



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8 Commitment to the Rural Way of Life

In areas where healthcare providers are traditionally in short supply, students in UMaine's Rural Family Nurse Practitioner Program are addressing the needs of the underserved by increasing access to primary care for people of all ages. In so doing, they are helping to preserve the quality of Maine's rural way of life.

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Artist James Linehan combines abstraction with representation to paint Maine landscapes that are always on the edge. His works push the edges of American realism. His subjects are meditative and familiar, yet always showing nature at the edge of human activity. For Linehan, this past decade of landscapes illustrates the edge on which he balances in order to find a stability and stasis in his art.



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Acadia (Surf Near Thunder Hole) 1997, oil/canvas, 44"x54." Collection of MBNA.

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What started as a student initiative to incorporate horses into the university experience has grown into UMaine's multi-faceted Equine Program, highlighted by an academic focus on the science of horse management, leading research in equine reproduction and support from Maine's harness racing community.



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19 Seagrass Health

UMaine electrical and computer engineers may not know much about seagrass, but couple their expertise in neural network technology with biologists' observations of the declining underwater plants and you've got the potential to monitor the health of the natural resource worldwide.



Photo courtesy of Suzanne Fyfe

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Lobster

Research by anthropologist James Acheson finds foundation for a modern co-management system

A CASE THE SIZE of a small refrigerator in the office of anthropologist James Acheson is stuffed with navigational charts of the Maine coast. They show all the islands, coves and harbors, but the most important lines are hand drawn in black and red ink across stretches of water. The lines define unmarked lobster fishing territories that were first documented by Acheson's research.

Such territorial boundaries are indicative of the long-practiced self-management strategies that shore up Maine's age-old lobster industry. Indeed, lobster territories are as much a part of the coastal scene as ferry boats and fog. They are controlled exclusively by individuals or groups of lobstermen, and woe unto the intruder who decides to test the willingness of fishermen to defend their boundaries.

More importantly, they are an integral part

of a culture of conservation that has helped the Maine lobster industry to maintain high harvests, even as other fisheries from New England to Asia experience sharp declines and government closures.

Anthropologist James Acheson calls the state law that created the regional zone councils "the most important piece of legislation concerning the lobster industry passed in the 20th century."

In the mid-1990s, Acheson began hearing that lobster territories were changing, even going out of existence. That's when he and graduate student Jennifer Brewer interviewed 80 lobstermen and compared the findings to those compiled in the 1970s. The result: "Those lines are still there. No question of it," Acheson says.

The concept of exclusive fishing rights has now been built into Maine law. In 1995, the state legislature established regional lobster zones — one of the first efforts in the world to allow fishermen to exercise meaningful responsibility for the rules that govern a commercial fishery. In the opinion of Acheson, a University of Maine professor who has studied the state's lobster industry for about 30 years, they were "a radical concept."

"Up until 1990, it was thought that there were generally two solutions to resource management problems. One was to privatize everything, and the other was to have the government come in with top-down rules. Now there's a third option, and it's one that we helped get rolling. It's local governance."

The new zones encompass all of the lobster fishing harbors. The zone boundaries were



Photo by Robert B. Gorrill

Lines

Lobstermen's traditional territorial boundaries provide the that can serve as a model for fisheries worldwide

designed to take into account the informal territorial lines.

In 2002, Maine lobstermen brought in more than 62 million pounds of lobsters — one of the largest catches since record keeping began in 1880. According to the Lobster Institute at UMaine, the state produces about 70 percent of the annual harvest in the United States.

Through his research, Acheson knows that such success is not just a fact of nature. It has as much to do with the rules and traditions of lobster fishing communities.

Acheson has spent countless hours on the docks and at sea observing men and women as they go about their work. He lived in a fishing community for more than a year and helped fishermen check traps in foul and good weather. He has surveyed them on subjects ranging from where lobsters can be found to

their attitudes toward neighboring fishing groups. He has attended countless meetings of Maine lobster zone councils and government agencies.

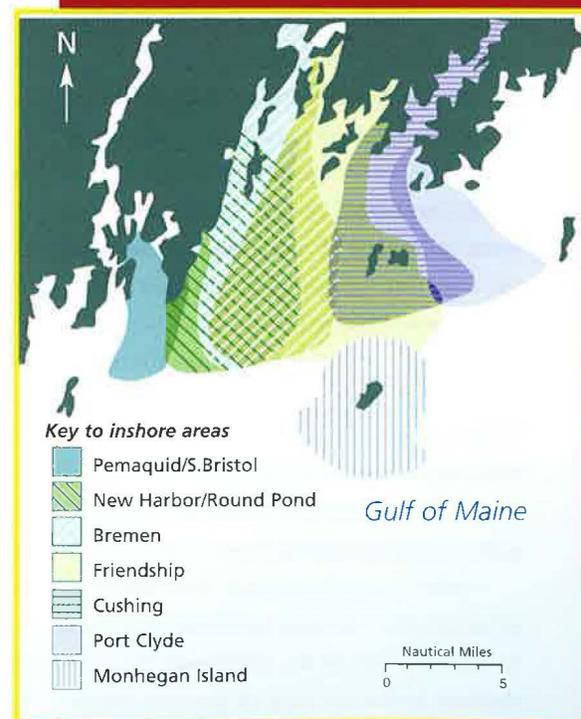
He described the cultural and economic aspects of those lobster fishing communities in his 1988 book, *The Lobster Gangs of Maine*. His latest volume, *Capturing the Commons: Devising Institutions to Manage the Maine Lobster Industry*, published this past spring, analyzes the political side of lobster management.

EFFORTS TO CONTROL lobster fishing date back more than a century to a time when lobstermen, the Maine Department of Sea and Shore Fisheries (now Department of Marine Resources) and the state

Harbor Gang Territory

A MAP OF INSHORE FISHING AREAS in Maine's mid-coast region shows several of the informal territorial boundaries used by lobstermen. In 2000, the boundaries represented the farthest point most fishermen from their respective harbors could go during the summer lobster season without courting trouble from neighboring harbor gangs defending their territories. Maine lobstermen fish year round, but the crustaceans are less active as water temperature drops. In the cold months of the year, lobster fishermen place traps in the deep water areas offshore, where no territorial boundaries are defended. Around Monhegan Island there is a conservation zone where only Monhegan fishermen are allowed to trap. The zone started as a perimeter-defended area, maintained and protected for generations. Today, Monhegan's conservation zone is enforced by state law.

Muscongus Bay Area, Mid-Coast Maine



Map reprinted from *Capturing the Commons* by James Acheson (2003)

A lot of fishermen appreciate James Acheson's direct approach to learning about the lobster industry, says Brian Sawyer of New Harbor. "Jim wasn't afraid to put on oil skins and a slicker, come out on the boats and get wet and dirty."

Russ Nisbet of New Harbor says that lobstermen have had a hard time convincing the state of their point of view. Nevertheless, he says, "many of things that we've proposed over the years have now been put in place, and we're all better off for it."



Photo by Robert B. Gorrill



Photo by Robert B. Gorrill

"We've got 13 out of the world's 16 major fisheries in crisis, including all of the groundfisheries in the Gulf of things have been done right. One of them is the Maine lobster fishery, and there's a lot that we can learn from

legislature ran the show. Since then, the system has become more complex.

The federal government has become a major player in fisheries management. Lobstermen debate proposed rule changes in their regional council and before the Atlantic States Marine Fisheries Commission.

Historically, Acheson says, Maine lobster fishermen have operated harbor by harbor through a close-knit social network, known locally as "harbor gangs." Lobstermen also speak of "a gang of traps" in reference to all the traps that a single fisherman may have in the water at one time.

Harbor gangs enforce local rules about who fishes where and when. In some cases, they have organized cooperatives where most members sell their catch. As needed, gang members help each other out by checking each others' traps or providing a tow.

Harbor gangs also defend their traditional territories. There is more than a kernel of truth to the stereotype of the lobsterman who cuts the lines or destroys traps of intruders. Never-

theless, Acheson emphasizes that most fishermen strictly follow the law. They operate with required licenses, return egg-bearing lobsters to the sea and observe limits on the numbers of traps they can have in the water at one time.

Lobster fishing territories are an integral part of a culture of conservation that has helped the industry in Maine to maintain high harvests, even as other fisheries from New England to Asia experience sharp declines and government closures.

It wasn't always that way.

"You've had a real culture change over the course of the last 70 years," Acheson says. "People in the 1920s and '30s were overfishing and scrubbing eggs off lobsters. There was a massive trade in illegal size lobsters; taking home short lobsters wasn't just considered normal, it was an economic necessity."

Annual harvests then were a far cry from what they are today. They fluctuated between 5 million and almost 8 million pounds.

WHAT MADE THE DIFFERENCE, Acheson says, is that fishermen began to believe that conservation could work to their benefit.

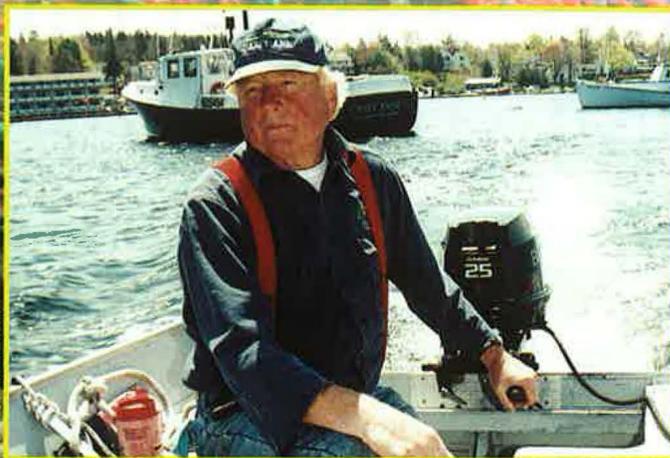
"The biology of the lobster is the same. The lobster traps and social organization, the harbor gangs, are largely the same. The rules are largely the same. We've always managed by protecting the small juvenile lobsters and large breeding lobsters. And we had all those rules in the 1930s.

"At the end of the 1930s, an increasing number of guys started to obey the law, and they insisted that other people do it too. The commissioner of the Maine Department of Sea and Shore Fisheries started to hear more and more complaints. 'You've got to send a warden down to such and such harbor. I know a guy who's taking and selling short lobsters again. If you send a warden down here, I'll help you.' You never saw that in the teens."

Lobster landings started to rise in the 1940s and remained steady until the '90s, when the harvest more than doubled. In 1995, the regional zone councils conferred new authority on

Through the years, James Acheson (right) has talked many times with Larry Knapp of Boothbay, chair of the Zone E council. Knapp is working with the state legislature to improve the controlled entry system for the lobster industry.

Rusty Court of East Boothbay says he feels that the lobster zone councils have been good for the industry. They have made effective decisions that will help to sustain the fishery for the future.



Maine. There are very few cases where that case." James Acheson

lobstermen. Acheson calls the law that created the councils "the most important piece of legislation concerning the lobster industry passed in the 20th century." He and UMaine economist Jim Wilson had a hand in its creation.

"The new state lobster zones involve guys from a whole lot of harbor gangs, people who used to fight and still do. So you get into a zone meeting, and once in a while there are people who won't speak to each other. But they're overcoming this," Acheson says.

The zone management law gives locally elected lobster councils authority over three aspects of fishing: trap limits, the number of traps on a single line and the time when fishing is allowed. This grassroots approach departs from business as usual when rules are set and enforced by government.

The councils have had their problems, but they have conducted elections, debated important local issues and recommended regulations that have been supported by the industry. They are working well, Acheson says.

"One of the critical questions we have to

ask in resource management is when, where, how and under what conditions you can get user groups to pass rules to constrain themselves for communal benefit," he says. "From an individual perspective, and in the absence of rules, it is rational to get the resource before someone else comes along and takes it. It is not at all clear in the social science literature under what conditions people will pass effective rules."

Co-management, the idea behind the zone councils, has been criticized by those who feel it gives too much authority to special interest groups. "They feel it's like the fox guarding the chicken house," Acheson says. "But we've got 13 out of the world's 16 major fisheries in crisis, including all of the groundfisheries in the Gulf of Maine.

"There are very few cases where things have been done right. One of them is the Maine lobster fishery, and there's a lot that we can learn from that case."

Despite their early success, the new lobster management councils must steer through

rough waters stirred by serious conflicts. Some are deep-seated, such as the different interests of full-time fishermen and part-timers. Others stem from new policies, such as the boundary lines adopted to separate zones, and the inherent difficulties in managing politics in zones.

The ability of the councils to handle conflicts will determine their future, Acheson says. Already, the councils have been used by state government to respond to overarching concerns, such as right whale conservation, and they have performed better than many observers expected.

However, addressing such issues draws councils away from their primary mission and the fishermen they represent.

"In the past, it was often one harbor against another, but the zones have really superceded that. If you're going to make the zones work, all the towns in an area have to have representatives who will work together.

"On the whole, they seem to be doing that," Acheson says.

Nick Houtman

On the Trail of Maine's Ice Age

**Proposed route will highlight evidence of the last glacial recession
that created the distinctive Down East landscape**



LIKE A SEA OF GREEN breaking against the tree lines, the wild blueberry barrens stretch for miles in Washington County, Maine. The rolling landscape carpeted in the low-growing plants is dotted by boulders, some the size of pickup trucks.

From the vantage of a ridge snaking through the fields, geologist Harold Borns looks out across the panorama near Cherryfield, six miles inland from the Atlantic Ocean, and sees evidence of a very different setting. He describes a time, almost 14,000 years ago, when ocean waves broke against sheer ice cliffs and rivers poured off the edge of a dying ice sheet, carrying streams thick with sediment into coastal waters.

"This was the beginning of Maine as we

know it today. Everything was locked in the ice or under water. The first point of land to appear was probably the top of Cadillac Mountain (in Maine's Acadia National Park, Mount Desert Island)," says Borns, a professor of geological sciences and member of the University of Maine's Climate Change Institute.

As the ice retreated year after year, the sea moved in and covered the land. Today, the shells and fossils of marine animals that once colonized the sea floor in an Arctic-like ocean are analyzed to determine where and when the creatures lived, and in what conditions.

Coupled with the landforms that stretch along Down East Maine, the fossils have given Borns and his colleagues important clues about how the ice collapsed, the sea invaded



Hal Borns, professor of geological sciences and Quaternary geology, is working on a map of the state's Ice Age trail this year. One of the sites on

and the climate changed as the last Ice Age came to an end.

The resulting landscape still bears the scars. It has become a scientific treasure, one of a few places in the world, says Borns, where the signs that were left by the death throes of an ice sheet are so clear and indelible.

Borns has spent much of his life following the clues left by the last great ice sheets in North America, Antarctica and Europe. Now he and a group of private citizens and government agency representatives are working on a plan to share what he and other scientists have learned in Maine. The goal is to create Maine's Downeast Ice Age Trail, an idea that could have economic and educational benefits.



Photos by Toby Hollis

ies at UMaine, hopes to finish compilation of a driving tour
e trail will be the location pictured above in Cherryfield.

"This trail is about sea level rise, climate change and even archaeology," says Borns. "We have more than 40 potential sites. All of them are based on research that we've done right here over the past 30 years or so." Much of that work has provided educational projects for UMaine students and been supported by grants from the National Science Foundation.

The trail idea started with Pam Person of Orland, Maine, co-chair of the multi-sector Education on Energy and Climate Change Workgroup of Maine Global Climate Change. Inspired in 1999 by a similar project in Wisconsin, Person knew that such a trail could be a source of regional pride and attract a growing segment of tourists who are interested in the environment.

"Maine has better, more distinct, undisturbed glacial features than Wisconsin does," says Person, "and the University of Maine and the Maine Geological Survey have some of the most respected glacial geologists in the world. We wanted the public to know about them."

As Borns and Person envision it, the trail will start on Cadillac Mountain and take travelers to other Ice Age sites in Acadia National Park and on Mount Desert Island: glacially carved mountains, lakes and the only true fjord on the East Coast, Somes Sound. The trail will proceed to a sand and gravel delta left by the melting ice sheet near Ellsworth.

East toward Lubec is a turning point in Ice Age history. In this area, the proposed route will cross moraines (ridges of rock and soil pushed ahead of the glacier), exposed glacially carved bedrock and wide deltas left by rivers flowing off the ice. However, the landscape changes north of this line.

It's clear, says Borns, that the ice sheet didn't retreat all at once. In fact, the melting was interrupted by a thousand-year cold snap known as the Younger Dryas period. The ice sheet began to grow, then melted again in northern Maine. But because it happened so quickly, the ice sheet left behind none of the huge deltas and end moraines that exist closer to the coast.

"What we see along the trail to Lubec records a history of deglaciation that reflects

oceanic atmospheric reorganization in the North Atlantic. This whole area is of worldwide interest. Scientists have come from Europe, Canada and other parts of the world to study here," says Borns.

The idea of Maine's Downeast Ice Age Trail has already generated interest from state agencies, local organizations and Maine's congressional delegation. Mike Hermann, a cartographer at the Canadian-American Center at UMaine, is developing a map showing 32 possible roadside sites of interest. The project is featured in *Hiking America's Geology*, an illustrated book published by the National Geographic Society.

The Downeast Ice Age Trail could bring new visitors to the region, according to Fred Cook of Gouldsboro, executive director of the Downeast Acadia Regional Tourism Council. "We envision the trail as part of a package that will entice people who visit Acadia National Park to go to the Schoodic Peninsula, Campobello and other places," he says.

In addition, Borns notes, the hope is to eventually extend the trail through Calais to the Bay of Fundy, creating an international attraction.

Borns and Person have formed a steering committee to promote the trail and seek funds to develop roadside vistas, signage and maps. They are hoping that detailed trail maps will be available in 2004.

Nick Houtman





Commitment to the Rural Way of Life

The Family Nurse Practitioner Program focuses on the underserved in Maine communities

NANCY PUTNAM had been a registered nurse for more than two decades when she took a two-year leave of absence from Houlton Regional Hospital. Her decision to make a career change was followed closely — and with genuine concern — by many residents in her rural Maine community near the Canadian border.

“How much longer are you going to be in school?” townspeople asked when they saw Putnam in the local grocery store on weekends. “How are you doing in school? Do you like your courses and the professors?”

The impromptu conversations epitomized the encouragement and support Putnam experienced from her hometown while she was doing her graduate work in the Rural Family Nurse Practitioner Program at the University of Maine. People in Houlton knew and respected the work Putnam did as one of the healthcare providers in their area. Perhaps most important, they understood that she shared their commitment to a rural way of life, and would bring her training back to the community to provide needed services.

“I wanted to work one-on-one with people and promote healthy lifestyles,” says Putnam, a family nurse practitioner for the past seven years and one of three primary care providers at Houlton Family Practice. “The hospital offered interesting, fast-paced work and I loved it, but that setting is a very small part of people’s total lives.”

In primary care nursing, people are not seen as isolated but as “living connected to families and communities in which their health is inseparable,” she says. “It has to do with physical and emotional health, and their community interaction.”

UMaine student Pam Slaven in Machias
Photos by Kathy Rice



Putnam is one of 85 family nurse practitioners who received their advanced training at the University of Maine. Today, when a UMaine nursing student does his or her clinicals at one of more than 100 sites in the state, it's likely that the on-site instructor or preceptor is a graduate of the program, says family nurse practitioner Nancy Fishwick, an associate professor in the university's School of Nursing.

"There's a cadre of nurse practitioners now in rural Maine like Nancy Putnam who are alumni and who are teaching the next generation," Fishwick says.

UMaine's Rural Family Nurse Practitioner Program was one of three in the country, and the first in the state, when it was established in 1991 with the help of a more than \$670,000 grant from the U.S. Department of Health and Human Services. The first five students graduated in 1994.

Most students graduating with master's degrees in nursing from UMaine have trained to be family nurse practitioners. In addition, some recent graduates have focused on nursing education, administration and other advanced role options.

The emphasis at the School of Nursing is on increasing access to higher education for nurses, thereby increasing access to healthcare in rural areas. A Family Nurse Practitioner Program can put primary care providers into rural

communities that may not be able to support a doctor or that simply want to expand healthcare provider options.

Family nurse practitioners are "a virtual gateway" between patients — newborn to geriatric — and other care providers, says Carol Wood, the graduate program coordinator in the School of Nursing. In some areas, there is only one clinic for many miles around. With a rural family nurse practitioner in such a community, people don't have to go to different places seeking healthcare for family members. The family nurse practitioner has the ability to provide a full scope of healthcare to address common illnesses and to provide health promotion measures. In addition, the family nurse practitioner has a professional relationship with other medical personnel for consultation and referral.

"Some of our graduates head toward more isolated areas in the state where they may be the only or preferred care provider," says Associate Professor of Nursing and family nurse practitioner Judy Kuhns-Hastings. "Often these are positions that are not entirely attractive to a physician. Family nurse practitioners who are educated in the state have a commitment to that community and to improving the healthcare in that particular area."

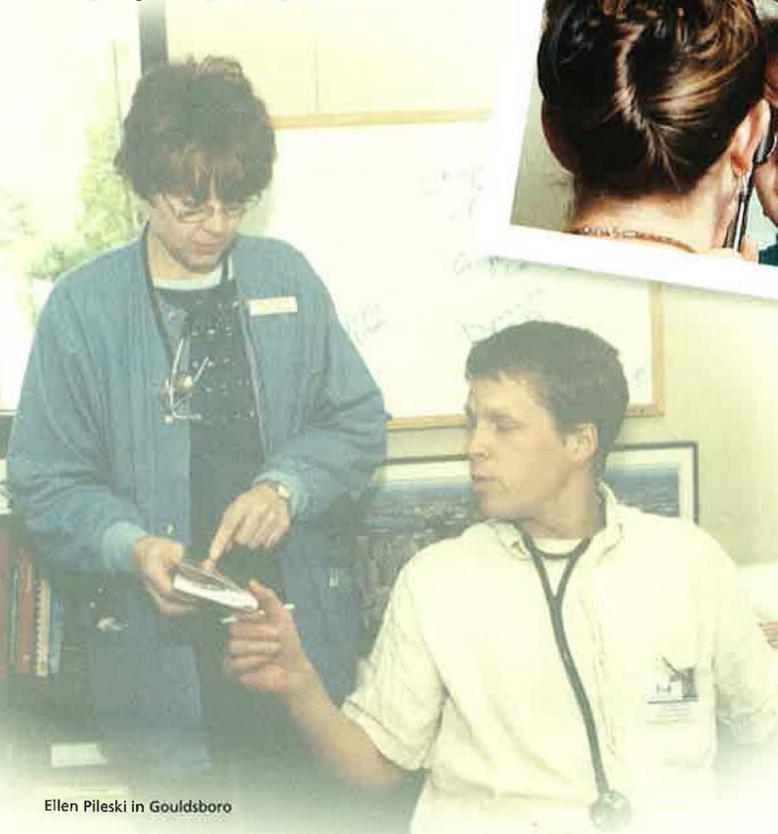
Ellen Pileski of Franklin is one of those family nurse practitioners trained to provide holistic patient care, looking at the effect of illness not only on the patient but the family. Pileski had been a nurse for nearly 20 years when she decided to return to school to study geriatric care. But in UMaine's Rural Family Nurse Practitioner Program, she also discovered a love of pediatrics and women's

health, and a desire to "find out what people need in the environment in which they live."

"It opened new perspectives," says Pileski, who graduates next year. "I will stay in Maine to practice; I wouldn't think of being anywhere else. I would love to own my own clinic with more of an old fashioned, door-to-door practice because in Franklin, whether you're younger or older, transportation is a big issue."

In their clinical training, UMaine students focus on the healthcare concerns they're likely to see in rural settings, including conditions brought on by isolation and the "culture of community" that often

UMaine students focus on the healthcare concerns they're likely to see in rural settings, including conditions brought on by isolation and the "culture of community" that often dictates how patients view healthcare and live their lives.



Ellen Pileski in Gouldsboro

dictates how patients view healthcare and live their lives. In parts of Maine, many people have no health insurance and will often not seek regular treatment, or will only seek medical attention when health problems have reached a crisis.

Today, there still are rural Maine areas underserved by healthcare, and the demographics are dramatically ratcheting up the need. Central and northern Maine have a disproportionately elderly population, says Fishwick. Older adults tend to have one or more chronic health problems, some that could be prevented.

Many times, the common denominator among the nurses returning for graduate degrees is their desire to prevent illness rather than just treat very sick patients. One of them is Lisa Starkweather, who was a cardiac nurse for nine years. She was looking for a way to continue to work with patients and be more autonomous in her healthcare role.

“Working in acute care, I’d see people coming in with preventable risk factors, like smoking and obesity. That’s when I decided I’d like to get into the community more and pursue more preventative care,” says Starkweather, who received her master’s degree this past May and was cited as the most outstanding student in her graduating class of nurses.

As if she needed further incentive to make a career change, Starkweather was inspired by her 90-year-old grandfather.

“He’s one of the greatest role models,” she says. “I looked at what preventative care has done for him and knew it was the place for me. My grandmother passed away in her 50s. They never went to a doctor. When my grandfather finally went in for a physical, it showed he had high blood pressure and was headed for a stroke. It’s because of preventative care that he’s now in great health and traveling the world.

“I see so many older adults debilitated. Some of that’s genetic, but much of it is preventable or can be brought under control.”

Teaching is a big component of a family nurse practitioner’s job, says Linda Wentworth, a nurse in the intensive care unit of Penobscot Bay Medical Center who received her bachelor’s degree from UMaine. “I strongly feel that if people have a good understanding of their disease process, it increases their compliance with the treatment regime.”

“Working in acute care, I’d see people coming in with preventable risk factors, like smoking and obesity. That’s when I decided I’d like to get into the community more and pursue more preventative care.”

Lisa Starkweather



Nursing student Mike Rizzo in Bangor
Photos by Toby Hollis

Even before she graduated this past spring, Wentworth knew what difference a family nurse practitioner can make, even far from home.

“The driving force for me to get my FNP was missionary trips to Honduras that I participated in,” she says. “I’ve done six so far and wanted to be able to do more for the Hondurans.”

During her most recent trip last October, Wentworth accompanied a family practice physician to a remote village. “It was the most incredible experience,” she says. “A lot of the Hondurans appreciated the explanations of their disease processes. They said it would be easier to deal with

the disease with knowledge of how the disease process works and why they have the symptoms they do.”

As Nancy Putnam sees it, “rural people are the same, whether in a lumbering community in western Maine or in an agricultural community” in Aroostook County.

“They depend on one another for their needs. They are family-centered and create their own community,” she says. “You find that even the people at the rural health centers are that way. From the receptionist to the people in the business office to the nurses and healthcare providers, they are supportive and committed to keeping healthcare available in the town.”

Margaret Nagle



Acadia (Facing Sand Beach) 1997, oil/canvas, 48"x60," Collection of MBNA.

Painterly Realism

James Linehan's landscapes are meditative and always on the edge

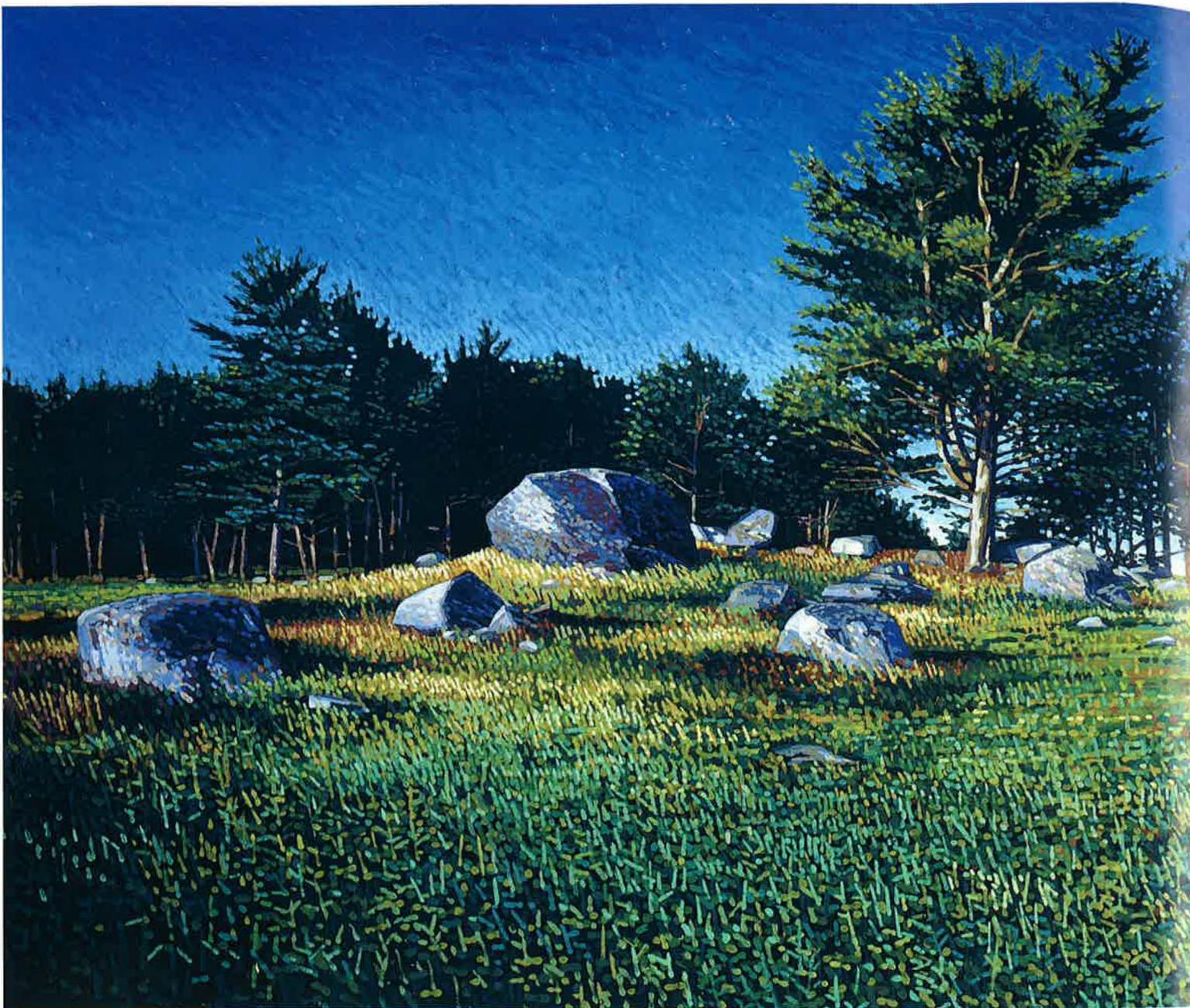


Photo by Toby Hollis

LANDSCAPES IN THE ART OF JAMES LINEHAN have taken many forms through the years.

In his signature "crossover works," in which realism juxtaposes the abstract, glimpses of landscapes are elements of the whole. The complexity and contradiction in Linehan's past works have been likened to James Joyce's metaphoric journeys through the landscape of the mind. With his canvas as something of a travel log, Linehan has recorded the evolution of his art and the landscape of his life, including milestones like marriage and fatherhood.

In his most recent paintings, landscapes dominate his work like never before. Considerably more conservative by Linehan standards



“I like combining abstraction with representation, the collision of abstraction from the space between these battling modes of expression.” James Linehan

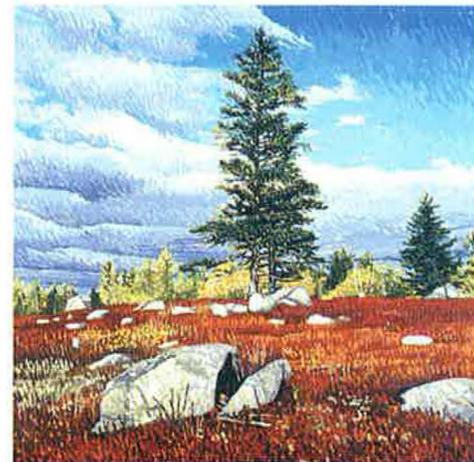
than his earlier works, they emulate the serenity and mystery of Maine’s natural landscape.

But while the images may have shifted toward realism, abstraction remains in Linehan’s artistic vocabulary — the rhythm of his brush strokes, the loose hatching of his images, the selection of his subjects. Because his is a natural and personal response to the landscape and a reflection of his “love of place,” stereotypic tourist images are not the objective. Instead, Linehan paints “fairly simple images” that have a meditative quality.

“My paintings are about contemplating nature in a Zen sort of way,” says Linehan, chair of the Department of Art at the University of Maine

and a professor on the studio art faculty. “I don’t like melodrama. I like landscapes where ‘nothing happens’ — no dramatic sunset or huge clouds rolling through, or deep, spiritual, breathtaking panoramas on the horizon. Instead, I paint an island road on a calm, clear day; birch trees at the edge of a field; spruce, pine, rocks and the edge of the water, with only a bit of road — a hint of human activity — showing.”

RESPONSE TO LINEHAN’S LANDSCAPES has been anything but passive. Since his first solo show of landscapes in 1994, Linehan has exhibited extensively in New York City and throughout the country, in the Maine Governor’s Mansion and in the U.S. Capitol. Commissioned



At left: *Morning Rise -- Brooksville 2000*, oil, wax/canvas, 60"x120." Collection of MBNA.

Above: *Blueberry Ridge (Fall) 1995*, oil/canvas, 48"x48." Collection of UNUM Provident, Portland, Maine.

and realist imagery, and the way meaning arises

percent for art pieces by Linehan are found in schools and other public buildings in six Maine counties, and on the University of Maine campus. He has done more than 21 public commissions, 26 solo exhibitions, and 75 group exhibitions in 25 years. Two of his paintings made the covers of L.L. Bean catalogs in 1995-96.

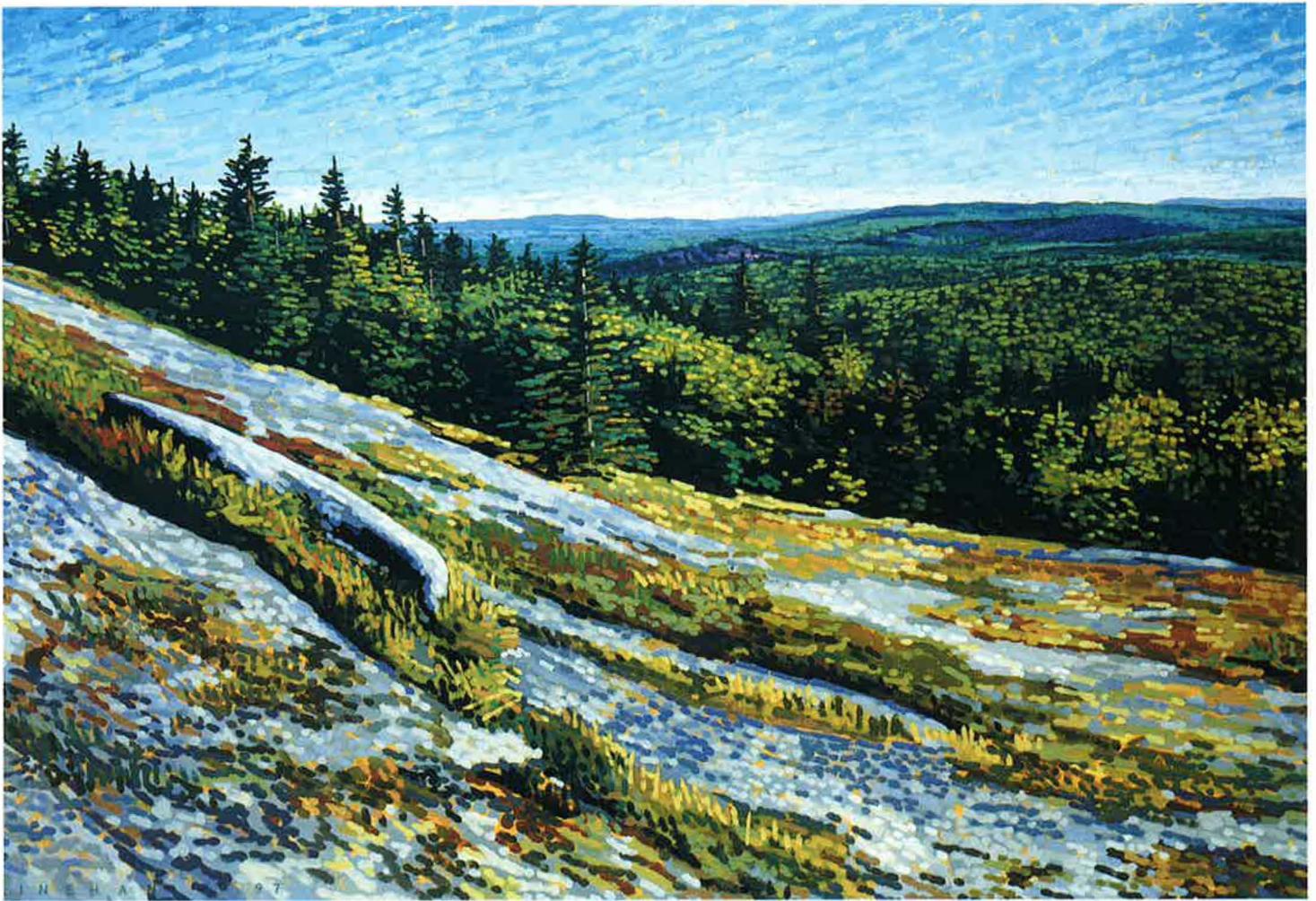
Audiences have seen his works on exhibit in Japan, Finland and Jordan.

Whether they are framed pieces 6-by-8 inches or murals 9-by-25 feet, his landscapes speak to familiar, uncontrived vistas, then quickly move beyond to the ever-present, provocative and often inexplicable dimensions of nature that humans struggle to understand.

"When people ask what I do, the first thing I say is that I'm a painter," Linehan says. "I think in paint and look at the world as a painter. Over the years, I've explored a number of different styles with my work and subjects. I like combining abstraction with representation, the collision of abstract and realist imagery, and the way meaning arises from the space between these battling modes of expression."

Linehan's landscapes are in the genre of what he calls "painterly realism — with an emphasis on painterly."

For instance, in New York gallery exhibits of conservative, contemporary American realism, Linehan is the "wild card — a loose, gestural painter."



Looking East 1997, oil/canvas, 40"x60," Collection of MBNA.

His landscapes speak to familiar, uncontrived vistas, then quickly move beyond to the ever-present, provocative and often inexplicable dimensions of nature that humans struggle to understand.

"I'm really at the edge of what some conservative, realist galleries would show, yet in most contemporary art contexts, these works are quite conservative," he says. "When painting, I'm a slave to the actual scene. I don't like to move a tree or a hill. I want my paintings to be true. If you change what nature gives you, you can get it wrong or have a hybrid that doesn't make sense."

LINEHAN JOINED THE UMAINE FACULTY in 1983, and spent the first decade "resisting the tag of being a landscape painter." But all that changed after years of visits to a family farm in Down East Maine. The rural area, complete with blueberry barrens, old apple orchards and acres of woodlands, gave Linehan a reason to confront Maine's beauty in his painting.

It's a view of the state's natural beauty that tourists don't often see, yet it is the landscape to which Linehan responded most.

His first large series of works inspired by the Washington County landscape was a suite of 30 paintings, some 54-by-72 inches. These and some of his other landscapes take their titles from the Maine dialect, with phrases like *Up Back* and *Over to Camp*.

"While I grew up in different parts of the country, I've explored Maine in paint now for 20 years," says Linehan. "This is where I'm truly at home."

In recent years, his explorations have taken him to other quiet, out-of-the-way places like the beach at Roque Bluffs, lupine fields on Little Cranberry Island, and the blueberry barrens and Walker Pond in Brooksville. The result: paintings that are "meditations of a sort."

"To me, painting is about finding stability, stasis and a kind of maturity; painting is how I find my place in the world," Linehan says. "I try to achieve balance — an absolute stillness and tranquility."

Margaret Nagle

Learning links students, horses and researchers in UMaine's new Equine Program

EQUESTRIAN Emphasis

KIERA FINUCANE DROVE four and a half days from her New Mexico home to Maine to go to college, a cross-country trek that would have been shorter except that Louie had to come along.

"I didn't have any relatives in Maine and knew if I was going, Louie also had to make the move," says Finucane. "I've had him since he was 8."

Finucane planned her trip to the University of Maine using a "stable directory" so that her 13-year-old Arabian gelding could spend nights in barns along the route rather than in a trailer. She is among a small but growing number of students attracted to and involved in UMaine's Equine Program.

"It has had a big impact on my involvement in the university community," says Finucane, a double major in animal science and biology who will apply to veterinary school starting this October. "It has made UMaine a tremendous experience for me."

UMaine's horse program is built on a foundation of cutting-edge biomedical research, concern for animal welfare, and active involvement

of students and Maine's equestrian community. Two of the top researchers in equine reproduction and infertility — UMaine faculty members and veterinarians Dr. Robert Causey and Dr. Jim Weber — lead the program.

Students with interests in horses, including some like Finucane who board their mares at UMaine, work side by side with the researchers. They also participate in a barn cooperative at the J.F. Witter Teaching and Research Center near campus, where the focus is on a scientific approach to equine management. UMaine now offers an academic minor in equine studies, and a major concentration in equine business management, directed by associate professor Jim Leiby in the Department of Resource Economics and Policy.

UMaine's equine management cooperative is a student-managed facility, home to more than 30 boarded and donated horses. Students have nearly 10 miles of trails to ride near campus. In addition, they have formed an intercollegiate equestrian team and a drill team.



Photos by Monty Rand



Photo By LeeAnne Pooler

With support from Maine's harness racing industry, some horses retired from the track are donated to the university, where the standard-breds are retrained for pleasure use. Students and professional trainers prepare retired racehorses, as well as foals, for new lives in the community.

"The value of our program is that anyone from any major can enroll in the minor in equine studies," says Causey. "Horses cut across all disciplines, from biology and medicine to business and marketing, athletics and gymnastics, tourism, recreation and land use, education and social work.

"With the program, we also provide graduate education opportunities in both the biomedical and veterinary sciences. Most recently, we received a USDA grant to help develop a vaccine to control reproductive infections in horses."

THE WITTER CENTER, part of the Maine Agricultural and Forest Experiment Station, is a 400-acre working farm near the Orono campus. Seven years ago, it underwent a transformation. What had been exclusively a research facility now includes a center for student-focused learning. In addition to research, animal science faculty and nearly 300 students of many academic disciplines are involved in classes at Witter, including several who participate in the farm's management through the horse cooperative and UMADCOWS (UMaine Applied Dairy Cooperative of Working Students).

Today, the self-sustaining equine management cooperative is home to 16 horses donated to UMaine and up to 18 boarded by students.

Erin Emmans took the reins behind the university's pacing mare Venus of Milo in a race in 2000 to benefit historic Cornish Trotting Park. Now a UMaine graduate, Emmans is in veterinary school at the University of Prince Edward Island. Venus is now retired and being retrained at the Witter Center.

Members of the co-op — both those boarding horses and those with an interest in equines — each undertake up to 20 hours of chores weekly, from 5:30 a.m.–10 p.m.

"Witter has an amazing group of dedicated people, all here for the common good of the animals," says Finucane, who, like some of her peers, also became interested in Witter's dairy herd, last year serving as student advisor for UMADCOWS. "You learn about dealing with people and getting everyone to work together. It's a place where everybody knows your name — our own version of 'Cheers.'"

As of March, four prospective students entering UMaine this fall had already filled out applications to be part of the co-op. Rarely a day goes by that Witter livestock manager Marcy Guillette doesn't get at least one inquiry from a student hoping to participate.

"We have more students with more knowledge and interest in horses than ever before, including more beginners and students for whom working with horses has been a life-long dream," says Guillette.

"Several of our students are working at well-respected horse facilities in New England; others have continued to graduate or veterinary school."

Retired racehorses are put through two years of retraining for pleasure use. To date, six have been retrained and sold to good homes, with the proceeds helping to support UMaine's Equine Program.

With foals now born at the farm, the Equine Program is providing a comprehensive living laboratory and learning environment.



Reproduction research



Dr. Jim Weber regularly involves students in his research projects.

IT MAY BE A COMPLIMENT when a physician tells a patient he is healthy as a horse, but for veterinarians and horse breeders, the old adage can belie the truth when it comes to equine reproduction.

Horses in captivity have one of the lowest reproduction rates of domestic livestock, with only about half of all bred mares delivering a foal. Despite advances in veterinary medicine, the foaling rate

has not changed in a quarter-century.

Infertility in horses can be the result of poor equine management and health, especially bacterial infections. Low foaling rates have both animal welfare and economic development implications.

At the University of Maine, veterinarians and faculty members Dr. Robert Causey and Dr. Jim Weber are involved in biomedical research that addresses issues related to equine reproduction and infertility. Their work, which benefits the animals and the horse-owning public, is integral to UMaine's Equine Program, with its emphasis on the science of equine management.

Through their research, Causey and Weber are exploring the causes of infertility in both stallions and mares, and investigating treatments that can help mares deliver healthy foals at the end of their 11-month pregnancies. Their focus is on the biology of reproduction, including why some mares are more susceptible to the most common cause of equine infertility — uterine infections. In research to better understand the struggle between host defenses and invading bacteria, Causey and Weber are looking at the effect of different intrauterine medications and the animal's immune response.

The bacterium *Streptococcus zooepidemicus*, the organism most commonly isolated in infected mares, shares attributes with the group A streptococci, the human pathogens that cause such illnesses as strep throat and rheumatic fever, as well as uterine infections. Advancements in the treatment and prevention of uterine infections in horses, part of the push to fill in important gaps in our knowledge of equine infertility, could have human health implications.

Work by Causey and Weber on the immune response of mares to bacteria-induced uterine infection, was presented at the Society for Theriogenology Conference in Vancouver, Canada, in 2001, and at the Eighth International Symposium on Equine Reproduction last year in Colorado.

In addition, Weber has spearheaded Maine's research in artificial insemination in horses. While his primary research focuses on bovine reproduction, Weber also works with Maine horse breeders and veterinarians in such areas as equine embryo transfer, in vitro fertilization, and semen freezing and preservation. Such assisted reproductive technology in horses and cows is particularly important when it comes to producing genetically superior animals.



Student horse trainer Sarah Marriner (above) helps to retrain the retired harness racing standardbreds, including one that was sold last year. She also is training a lipizzan-thoroughbred cross.

Sarah Guilmain (right) is among the UMaine equestrians who would benefit from an indoor, multi-purpose arena at the Witter Center. With an arena, horse training and exercise can continue in the winter. Such a facility is integral to the development of an undergraduate degree program in equine business management. Guilmain, a graduate student in animal and veterinary sciences, works with Dr. Jim Weber and a medical researcher at Eastern Maine Medical Center to study the effects of hypothyroidism during pregnancy on fetal nervous system development in mice.

IN 1998, AN 18-YEAR-OLD standardbred stallion named Pedrine became the first retired harness racehorse to be donated to the University of Maine. The donation was facilitated by the U.S. Trotting Association and the Standardbred Pleasure Horse Organization.

Standardbreds are considered intelligent, versatile, easy-going trotting horses. Until recently, the breed was thought to be limited largely to racing, so that horses that came off the track faced uncertain futures.

At UMaine, retired racehorses receive about two years of retraining

UMaine's Equine Program is built on a foundation of cutting-edge biomedical research, concern for animal welfare, and involvement of students and the state's equestrian community.

for pleasure use. Whether the horses are trained in dressage, jumping or driving depends on the animal. To date, six retired racehorses have been retrained at UMaine and sold to good homes, with the proceeds returning to the program.

To support the teaching and research, retired racehorses donated to the university must be reproductively and physically sound mares, usually ages 3–10. Twice weekly, certified horse trainer Jan Hartwell comes to Witter to supervise the retraining program. Working closely with her is student trainer Sarah Marriner, a fourth-year resource economics major specializing in equine business management. Marriner, who started



riding at age 3, has learned from some of the best professional horse trainers in Maine. At Witter, she trains horses and mentors her peers.

The Maine Standardbred Breeders and Owners Association, and members of the Downeast Harness Horsemen's Association, offer internships. Students also work with UMaine alumna Valerie Grondin, who for the fifth season is training a university-owned horse at Bangor Raceway.

Grondin first worked with a 4-year-old standardbred named Venus of Milo that was donated in 1998 by the late Tom Kole, former executive director of the Maine Harness Racing Promotion Board. Prize money that Venus won in two seasons covered training costs and supported the UMaine Equine Program.

Venus is now in the retraining program at Witter. The university continues to have a presence at the track in the form of One Vine Lady, a standardbred purchased for the program in 2001 with the help of Maine's Harness Racing Board. As an ambassador for UMaine's Equine Program, One Vine Lady, like Venus before her, has quite a following.

"The support of the local equine industry has made this program possible," says Causey. "The donation of retired racehorses, the support of industry leaders, and the welcome for UMaine students at local equine facilities have given our students an array of choices as they include horses in their education."

Margaret Nagle

SEAGRASS HEALTH

UMaine engineers develop neural networks to help biologists monitor declining underwater meadows

MARINE BIOLOGISTS from Maine to Australia are working with electrical and computer engineers to monitor an ecosystem — seagrass meadows — in retreat. Seagrass, which provides critical habitat for commercially important fish species, occupies about 10 percent of the world's coastal seas. Unlike seaweeds, these rooted underwater plants flower and drop their leaves like their land-based cousins.

In the 1930s, a disease decimated a type of seagrass known as eelgrass (*Zostera marina*) in Atlantic waters bordering North America and Europe. Although the cause is uncertain, it has been linked to warming water temperatures and microorganisms.

The beds eventually recovered, but today, eelgrass and other species of seagrasses appear to be in decline worldwide. Some losses have been severe. In the past 20 years, areas of the Indian River Lagoon on Florida's Atlantic coast have lost as much as 95 percent of their coverage. Maine's Taunton Bay has lost about 90 percent of its eelgrass in the last six years. Additional declines are being monitored in Australia and Europe.

A continuing decline could deal another blow to an already struggling global fishing industry.

The job for scientists is clear: understand what's causing the decline of these delicate habitats and develop ways to restore them. Researchers already know that reduced light transmittance through the water is a major factor. The problem usually starts at the deeper edges of the beds, where the light reaching the plants is only marginal, and progresses toward shallower regions as conditions deteriorate. Reduced light is often related to murky water conditions that result from land erosion.

To address this problem and even predict seagrass stress before more beds are lost, biologist Suzanne Fyfe at the University of Wollongong in Australia is using light reflected from seagrass leaves to develop an early warning system. Currently, satellite or aircraft remote sensing techniques can only detect deterioration in seagrass health after large-scale dieback has already occurred, she says.

To turn measurements of reflected

light into a predictive tool, Fyfe has turned to University of Maine Assistant Professor Habtom Resson, who leads a research team in the Intelligent Systems Laboratory (INTSYS) of the Department of Electrical and Computer Engineering. Resson specializes in a computer software system known as an artificial neural network, or neural net.

In INTSYS are three faculty members, a research associate and more than a dozen graduate and undergraduate students. The seagrass project is one of several active studies in the lab. Others focus on DNA analysis, gene expression and industrial process control.

Working on the seagrass project with Resson are research associate Padma Natarajan, a 1999 UMaine graduate, and electrical engineering master's student Siva Srirangam.

The common thread running through the lab's research is the use of computational intelligence techniques to extract knowledge from data. Neural nets have been around for more than 40 years and today are widely used in industry and business.

Photo by Heather Dine, courtesy of the National Oceanic and Atmospheric Administration (NOAA) Photo Library





They improve voice transmission over telephone lines, teach machines to talk, recognize patterns and analyze financial markets. While they consist of sets of mathematical equations, neural networks are nevertheless inspired by nature. Individual parts of a neural net are viewed as nerve cells and the connections between them as the junctions that link cells.

"From an engineering perspective, our brains are essentially neural networks," says Resson, who received his Ph.D. from the University of Kaiserslautern in Germany in 1999. "We can learn things from what we see. We can correct things. Initially, an artificial neural network has no idea about the relationships between inputs and outputs. As it runs, it will see its own errors and modify its own parameters."

To the casual observer, the neural net seems to perform statistical magic. It doesn't depend on knowledge of a specific system, but it does require quality data. Moreover, its ability to learn and adjust gives the neural net an advantage over conventional modeling approaches, especially in dealing with complex systems.

A seagrass ecosystem fits that model. A case in point is Fyfe's effort to predict seagrass stress on the basis of reflected light. Fyfe uses a device known as a spectroradiometer to identify the changes in the light reflected from seagrass leaves.

Resson's neural network transforms the database of information into a mathematical tool. That tool can then be applied to remote sensing data to predict stress levels in seagrass meadows before dieback occurs.

Running mathematical models is a bit like playing a game of darts in the dark. Scientists may know that their results are accurate within a certain range, but they don't know exactly how close they are to the bull's-eye. By improving model accuracy, neural nets turn the lights up a bit, letting scientists know that their results are closer to the mark.

Poor water quality, including murkiness or algae that keep out sunlight, is a threat to seagrass. In collaboration with scientists from St. Johns River Water Management District in Florida, Resson and his team are studying how to use water quality data to achieve a better estimate of light reduction and, thus, seagrass health.

"The district monitors seagrass in the Indian River Lagoon in correlation with water quality parameters, such as nutrients, turbidity and clarity. They call seagrass 'the barometer of the ecosystem,'" says Resson.

In 2002, Resson met with scientists from the district in a workshop on biodiversity and ecosystems for Indian

River Lagoon. He co-organized it with Natarajan and other UMaine faculty members: Mohamad Musavi, George Markowsky, Thomas Wheeler, Anthony Stefanidis and Cristian Domnisoru.

The district already uses a model to correlate water quality parameters with light attenuation, says Resson. Using the district's water quality data, the UMaine neural network came closer than the district's own model in predicting the relationship between water quality and light traveling through the water, and the impact on seagrass health.

"Neural networks try to correlate difficult-to-measure variables with easy-to-measure variables," says Resson. "The advantage is that no prior information is necessary. That's why we are able to jump into these subjects. Our background is in electrical and computer engineering. I personally have no knowledge of the biological relationships."

In addition to their seagrass work, Resson and his team are working with the National Aeronautics and Space Administration to apply a neural net to ocean data from satellites. Their goal is to estimate chlorophyll concentrations, an indication of algal growth and ocean vitality.

Nick Houtman



Effectively monitoring the health of seagrass meadows in the world's oceans is the goal of biologists and other scientists working with UMaine electrical and computer engineers Padma Natarajan (pictured above) and Habtom Resson (left).

Photos by Michael York



Home is where the radon is

UMaine professor of physics and one of the nation's leading authorities on radon. The undergraduate's research could be useful in reducing human exposure to radon, a colorless, odorless radioactive gas that is a leading cause of lung cancer, according to the U.S. Environmental Protection Agency (EPA).

Radon, a common component of granite, can seep into homes through basements and from well water use in households. Homes in southern Maine tend to have high radon levels.

"(Using) a couple of radon detectors, I found out that my parents' home had very high radon levels in the air. The EPA action level is four picocuries per liter; I found an average level in my parents' house of about 11 picocuries per liter," says Tripp, who graduated from the university in May, headed for a career in the nuclear industry.

Every month, Tripp measured radon levels in the air and water. He took simultaneous air readings in the basement and on the first and second floors. Tripp equipped an upstairs bathroom with three detectors to track radon as it entered the room during showers, and he took monthly samples of tap water. He brought all his recorded data and water samples to the nuclear laboratory at UMaine for analysis.

Tripp found that levels of waterborne radon in the family's well water doubled from November–January. He also recorded unexpected differences in floor-to-ceiling levels of radon during showers in the bathroom. But surprisingly, radon levels from the basement to the second floor of the house appeared to be relatively even.

Tripp suspects that air flow and ventilation may help to explain some of his results.

Championing education

WHEN LINDA GABRIELSON started graduate studies at the University of Maine, there's no way she could have predicted how her education and professional pursuits would coincide this year.

Gabrielson is finishing doctoral coursework in higher educational leadership after three years of classes taught by some of the state's foremost experts, including former University of Maine System Chancellor Terrence MacTaggart.

Gabrielson has been in the classroom for a decade, teaching at Southern Maine Technical College in South Portland. One of her responsibilities last semester was establishing the college's new Center on Teaching Excellence. In addition, Gabrielson is participating in the transformation of Maine's technical college system to a statewide community college network as of July 1.

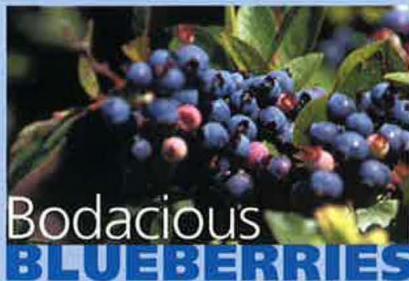
"It's an exciting time," says Gabrielson. "I look forward to continuing to work with students so we can open doors and change their lives. This transition (from a technical to community college system) is part of a bigger picture of making higher education the norm in Maine for those who have not thought about college or need the opportunities to participate."

Open access to higher education for all who want to pursue college has long been important to Gabrielson. Academic rigor, coupled with attention to the learning needs of students entering community college, ensures that graduates attain the level of training, education and knowledge required to pursue the next chapter in their lives.

"Academic integrity is alive and well, and I hope to continue to champion it, whether I contribute as an administrator, teacher or educational leader in a higher education organization."



Linda Gabrielson, a registered dietician, discovered her love of teaching when she taught nutrition and diet therapy. Through the years, her commitment to quality education, including service learning, has only gotten stronger.



Bodacious BLUEBERRIES

BLUEBERRIES MAY BE LITTLE, but scientists are finding that they have the potential to pack a healthy punch.

Researchers at the University of Maine and elsewhere are studying the compounds in blueberries that could protect vision, maintain memory, keep arteries flexible and reduce some of the side effects of diabetes.

UMaine has a long history of supporting the wild blueberry industry through agricultural and food product research to develop new markets. Physicians and health-conscious consumers also need sound information about how blueberry consumption may promote health.

Much of the research focuses on anthocyanins, pigments that make fruits and vegetables red, blue or purple. The colorful compounds are strong antioxidants that protect cells by scavenging free radical molecules in the body.

"Maine wild blueberries are unique because of the diversity of anthocyanin and other phenolic compounds they contain," says Mary Ellen Camire, professor of food science and human nutrition. For example, elderberries have two or three anthocyanins; wild blueberries have 15 or 16.

In recent research, Camire demonstrated that blueberries can inhibit an enzyme involved in diabetes side effects, such as blindness, heart disease and kidney damage. Research elsewhere also has shown that some compounds in the fruit may help the body regulate blood sugar.

In an ongoing project with Vision Care of Maine, participants are drinking blueberry juice and having periodic eye exams to test for vision changes. And in research in cooperation with the UMaine Department of Psychology, participants are taking powdered blueberries in capsule form to explore effects of anthocyanins on memory.

ELECTRICAL ENGINEERS and molecular biologists at the University of Maine have joined forces in an effort to develop a new sensor that can rapidly detect pathogens in water.

The goal is to develop a device that can help protect public and private water supplies.

With funding from the National Science Foundation, electrical engineer Mauricio Pereira da Cunha and biochemist Paul Millard are conducting their research in the UMaine College of Engineering and the Laboratory for Surface Science and Technology on campus.

Their proposed technology combines proteins and nucleic acids with crystals that vibrate under the influence of an alternating electric current. The frequency of that vibration changes when molecules bind to the crystal surface, and that change can be easily detected. For this project, the researchers will use langasite



Prospecting Pathogens

takes too long to return a result, says Pereira da Cunha. By the time water is taken to a lab for analysis and the results come back, there is a risk of contaminating a population, he says.

To develop a device that has the ability to recognize specific pathogens, the UMaine researchers must find ways of attaching and maintaining the sensitivity of molecules that bind biochemicals or organisms in a water sample.

In addition, because the sensor will be in the water it is monitoring, one of the research hurdles involves creating an electronic device that does not short out or attenuate.

crystals and attach nucleic acids or proteins to the surface that can recognize and bind to a possible contaminant, such as *E. coli*, *Salmonella typhi* or *Vibrio cholera*.

Currently used laboratory technology is costly and

Speaking Volumes

BOOKS IN FRENCH are strengthening ties between people in Quebec and Maine, and helping Franco-Americans maintain their culture and language.

The nearly 10,000 books were donated by schools, businesses and individuals in Quebec and distributed to Maine communities by the Franco-American Centre at the University of Maine.

The book distribution program was organized by Le Conseil de la vie française en Amérique (the Council on French Life in America), a Quebec-based group committed to helping people of French heritage in North America better understand and maintain their culture and language.

The donated volumes include children's books, dictionaries, novels and biographies. They were made available to the public in the regions of Biddeford-Sanford, Augusta-Waterville, Lewiston-Auburn, Bangor-Old Town, and the St. John Valley.

Previously, Le Conseil de la vie française en Amérique collected books for distribution in Louisiana. Yvon Labbé, the director of UMaine's Franco-American Centre and a member of the council, says he hopes more books can be collected for distribution to other New England states.



MAKE NO BONES about it, Angela Ferran loves biomedical engineering. The University of Maine senior has studied the use of bone in sensors and the separation of *E. coli* bacteria in liquid. NASA funded her most recent project — a study of diet and bone strength.

The results of her research could help the space agency address bone loss that astronauts commonly experience during extended space flights. It also could

contribute to dietary recommendations for people who suffer from osteoporosis.

Ferran's is one of three UMaine student research projects currently supported by the Maine Space Grant Consortium. Two others focus on detecting and controlling vibrations in composite structures.

Ferran, who grew up in South China, Maine, chose to major in bio-resource engineering on the basis of her strengths in math and biology. The potential for engineers to solve practical problems also was an incentive.

"Helping people is a big part of why people do engineering," Ferran says. "If my



Weightless Bones

used to simulate the effects of space travel on laboratory mice.

When she returned to Orono, Ferran built plexiglass cages for 40 mice and designed a study to probe the impact of dietary salt intake on bones. Some research suggests that salt can cause bones to lose calcium and weaken.

The project sets the stage for future simulated microgravity testing at UMaine.

This fall, Ferran will study biomedical engineering at Johns Hopkins. She then hopes to work in industry, possibly developing new approaches to prosthetics or tissue engineering.

research can be even a small part of doing something that helps somebody else, that would be very satisfying."

Last year, Ferran and Darrell Donahue, associate professor of chemical and biological engineering, went to California to meet with scientists and engineers at NASA's Ames Research Center. There they learned of ongoing projects in biomedical engineering and some techniques that can be



Secrets of Sharing

SHARING CAN BE a tough lesson for children to learn, but understanding what influences positive behavior could help educators and parents to promote it.

For her project in the University of Maine Honors College, Elizabeth Jutton, a senior in psychology, studied the factors associated with sharing behavior in children. In particular, she focused on the aspects of temperament that contribute to pro-social behavior.

Working with the staff at UMaine's Child Study Center and Cynthia Erdley, associate professor of psychology, Jutton

Those children who did share tended to be older and have more open, less introspective personalities.

developed a study that included questionnaires for parents and preschool teachers, as well as direct observation of children, ages 3–5 years old.

Jutton used crayons to find out if children would exhibit cooperation without adult intervention. Two children at a time were given a piece of paper on which to draw. One youngster had new crayons; the other had used and broken ones.

Cooperative sharing occurred in only four out of 18 trials, Jutton reports. Those children who did share tended to be older and have more open, less introspective personalities.

Last March, Jutton presented the results of her study in a poster at the Eastern Psychological Association in Baltimore, Md. She is now in the UMaine master's program in social work, and hopes to work with expectant parents and young families.

A \$6 Million Boost to Biophysical Research

THE NATIONAL SCIENCE FOUNDATION has awarded a \$6 million grant to the University of Maine, Jackson Laboratory in Bar Harbor, Maine, and Maine Medical Center Research Institute in Scarborough for the establishment of a Center for Molecular Biophysical Sciences. The funds

will be used to build a research partnership between the three institutions and to conduct interdisciplinary work leading to better treatment of genetic diseases.

Better understanding of structure/function relationships on a molecular and cellular level could open the way for the treatment of gene-based disabilities and diseases. It also is expected to lead to the development of more effective drugs and to advances in plant genome research, and in ecological and environmental sciences.

The grant will expand existing cooperative relationships among the three organizations. Last winter, they established an interdisciplinary Ph.D. program in functional genomics.

The primary objective of the new grant is to create a nationally recognized interdisciplinary center for biophysical research and graduate education.



Art of Community

ART CAN BE EMPOWERING, providing essential opportunities to understand, develop and express aspects of identity and voice. That's why taking art to underserved learners in the community is particularly important.

This is the third year of the art education topics course that focuses on service learning.

Students in an art education topics course did just that last semester by leading art teaching projects at four community sites in Bangor, Maine. Three of the students worked with at-risk adolescents at Acadia Hospital to create ceramic "identity" tiles. At Vine Street School in a program for children with autism, UMaine art education students helped youngsters to construct a walk-in "ocean box," complete with colorful sea creatures. Two students helped elders at a residential facility to make a memory quilt, and at a Head Start center, preschoolers explored "expressions of self" using masks, paintings and collages.

This is the third year of the topics course, which focuses on service learning. It was established by Laurie Hicks and is now taught by Constant Albertson, both members of the Art Department faculty.

Other community projects completed by art education students include a wall mural at a soup kitchen, children's paintings on a neighborhood bus stop, collage and wood sculptures at Acadia Hospital, and a "Keep It Real" mural at Shaw House, a shelter for homeless teens.

IN THE BRIGHT LIGHTS of Broadway, the Maine Steiners took third place in the International Championship of Collegiate A Cappella.

Receiving the competition's top award for vocal percussionist was Ben Feeney, a chemical engineering major at the University of Maine.

UMaine's 10-member, all-male a cappella group represented New England and central Canada in the international competition in New York City in late April. It was one of six collegiate groups chosen from a field of 108 to participate.

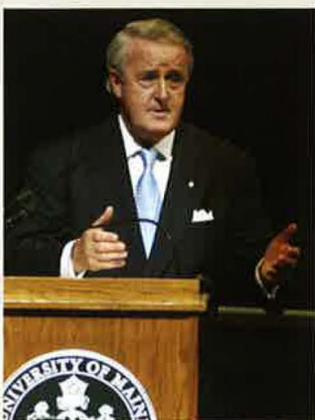
Maine Steiners was established in the late 1950s as an extension of the Men's Glee Club. Today, the group is affiliated with the select 64-member University Singers.



Photo by Janet Boyd

Hitting a High Note

Maine Steiners performs contemporary music and popular classic tunes, as well as arrangements by its members. It has recorded four CDs.



Northern Exposure

EXTENDING THE FREE TRADE ZONE to Latin America and South America should be a priority in a post-Sept. 11 world, according to Brian Mulroney, prime minister of Canada from 1984-93, who delivered the University of Maine's fourth William S. Cohen Lecture.

Expansion of the North American Free Trade Agreement to include 34 countries with 800 million people would create "an area whose socioeconomic security is indivisible," he said. "We need to act together to protect our external borders."

Mulroney, who spoke on campus May 9, was introduced by former Secretary of Defense William Cohen, for whom the lecture series is named. Mulroney and Cohen are strong advocates for improving growth in trade and cultural exchange between the United States and Canada.

Mulroney retired from political life in 1993 and currently practices law in Montreal.

The lecture series is a function of UMaine's William S. Cohen Center for International Policy and Commerce, part of the College of Business, Public Policy and Health.

Early Educators



IT'S NEVER TOO EARLY TO LEARN. That's the philosophy behind the new

Future Teachers Academy, offered this summer by the College of Education and Human Development at the University of Maine.

Last month, 30 Maine high school students aspiring to be teachers came to campus for a preview of their post-secondary preparation. The seniors and juniors have a year or more before graduating, but are highly motivated to pursue education careers.

The four-day academy, offered at no cost to the participants, featured workshops with UMaine faculty, high school teachers and students already in the UMaine teacher preparation program. The goal is to provide aspiring teachers with a realistic overview of the profession, including opportunities, challenges, issues and the accountability standards expected of today's teachers, as well as the latest research in teaching and learning.

Students were selected based on their academic records and interest in teaching, especially in those areas where there are shortages of educators.

Nearly half a century ago, a folk singer came to Maine to teach English and pursue music. The rest, as they say, is history.

EDWARD "SANDY" IVES was already collecting traditional songs when he came to the University of Maine in 1955. Through the music, he learned more about the cultural history of the men and women behind the melodies.

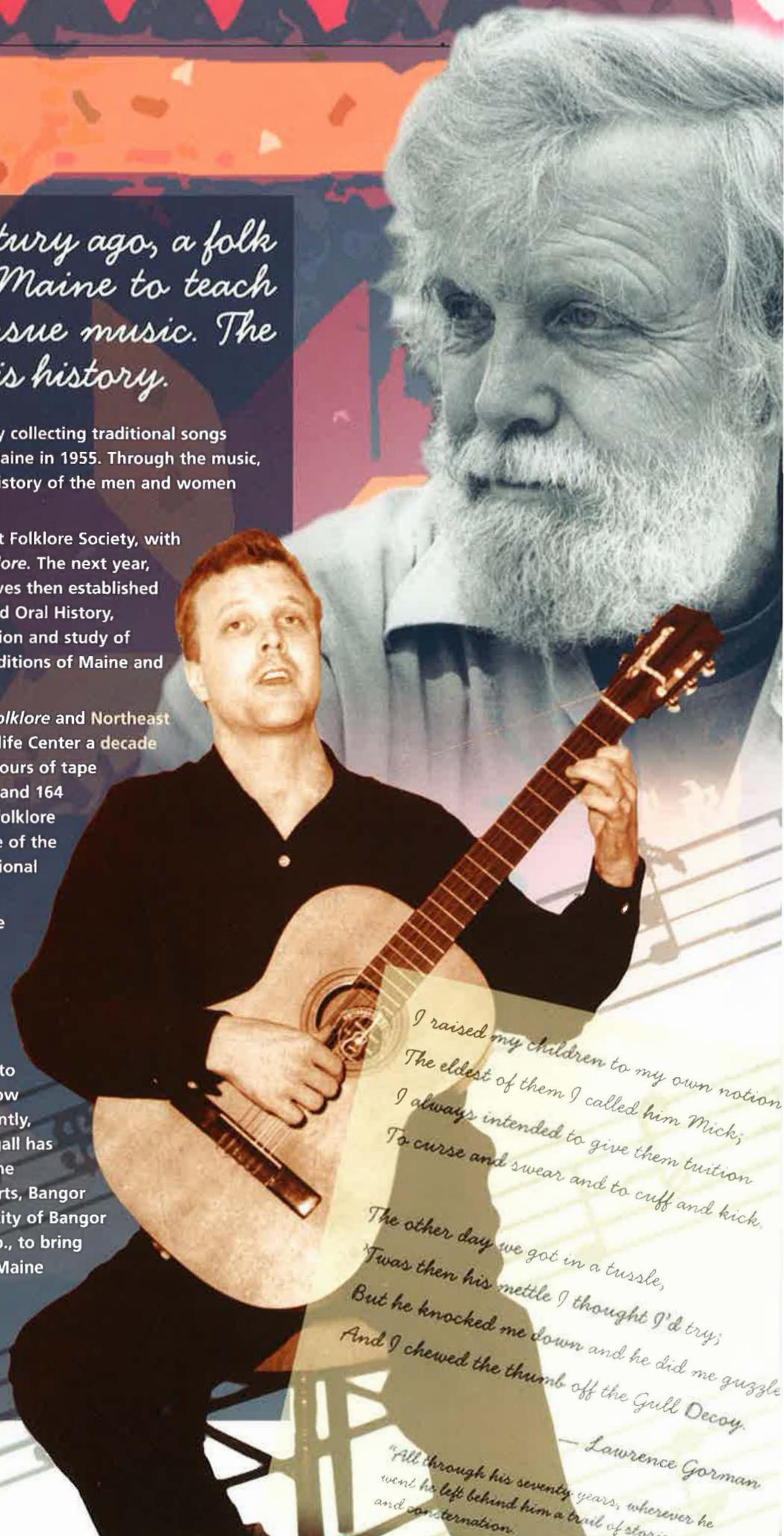
In 1958, he founded the Northeast Folklore Society, with its annual publication *Northeast Folklore*. The next year, he began teaching folklore courses. Ives then established the Northeast Archives of Folklore and Oral History, dedicated to the collection, preservation and study of the songs, tales, legends and oral traditions of Maine and the Maritimes.

Under his leadership, *Northeast Folklore* and *Northeast Archives* evolved into the Maine Folklife Center a decade ago. Current holdings include 5,000 hours of tape recordings, 10,000 photos and slides, and 164 linear feet of manuscripts related to folklore and social history. It is considered one of the finest ethnographic collections of regional culture in North America.

The preeminent folklorist of Prince Edward Island, New Brunswick and eastern Maine retired from the university in 1998. Today, at 77, Ives continues to do research, write and lecture on folklore and oral history. And the national spotlight continues to shine on the Maine Folklife Center, now directed by James Moreira. Most recently, Associate Director Pauleena MacDougall has worked in partnership with staff of the National Council for the Traditional Arts, Bangor Convention and Visitors Bureau, the city of Bangor and Eastern Maine Development Corp., to bring the National Folk Festival to Bangor, Maine for the second consecutive summer.

"Lasting Impression" features a memorable person or event in UMaine history.

Photos courtesy of Fogler Library Special Collections



*I raised my children to my own notion
The eldest of them I called him Mick;
I always intended to give them tuition
To curse and swear and to cuff and kick.

The other day we got in a tussle,
'Twas then his mettle I thought I'd try;
But he knocked me down and he did me guzzle
And I chewed the thumb off the Gull Decoy.*

— Lawrence Gorman
"All through his seventy years, wherever he went he left behind him a trail of stories and consternation."

A bridge to higher education

IN UPWARD BOUND, a college preparatory/academic support program, high school students learn they can succeed in school and in life. In six-week residential summer sessions at the University of Maine, the students are involved in rigorous coursework and internships in their fields of interest. Upward Bound counselors assist with issues such as financial planning for college, and offer academic support throughout the year.

Most Upward Bound students spend three summers at UMaine, including the months between high school graduation and the start of college classes in the fall. During that “bridge summer,” they take their first college course, paid for by a stipend from Upward Bound, which is part of the College of Education and Human Development.

“It was important to get into the course and realize I can do college work,” says Upward Bound graduate Isaac Wilkins, who now has a bachelor’s degree in business from UMaine and is pursuing a master’s degree in kinesiology.

To help more Upward Bound students who are headed to college, Friends of Upward Bound is establishing a \$1 million endowment in the University of Maine Foundation to provide similar academic stipends. UMaine Upward Bound students use the funds to purchase college textbooks and computers, supplement tuition costs and overcome other financial barriers.

“The first semester is the hardest financially” since scholarship monies often aren’t available until the beginning of the second college semester, says Nancy Cormier, who is now working at Gaylord Hospital in Connecticut after graduating this past spring from college. “My stipend allowed me to purchase some much-needed supplies and books.”

Increasing educational access is what Friends of Upward Bound is about.

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