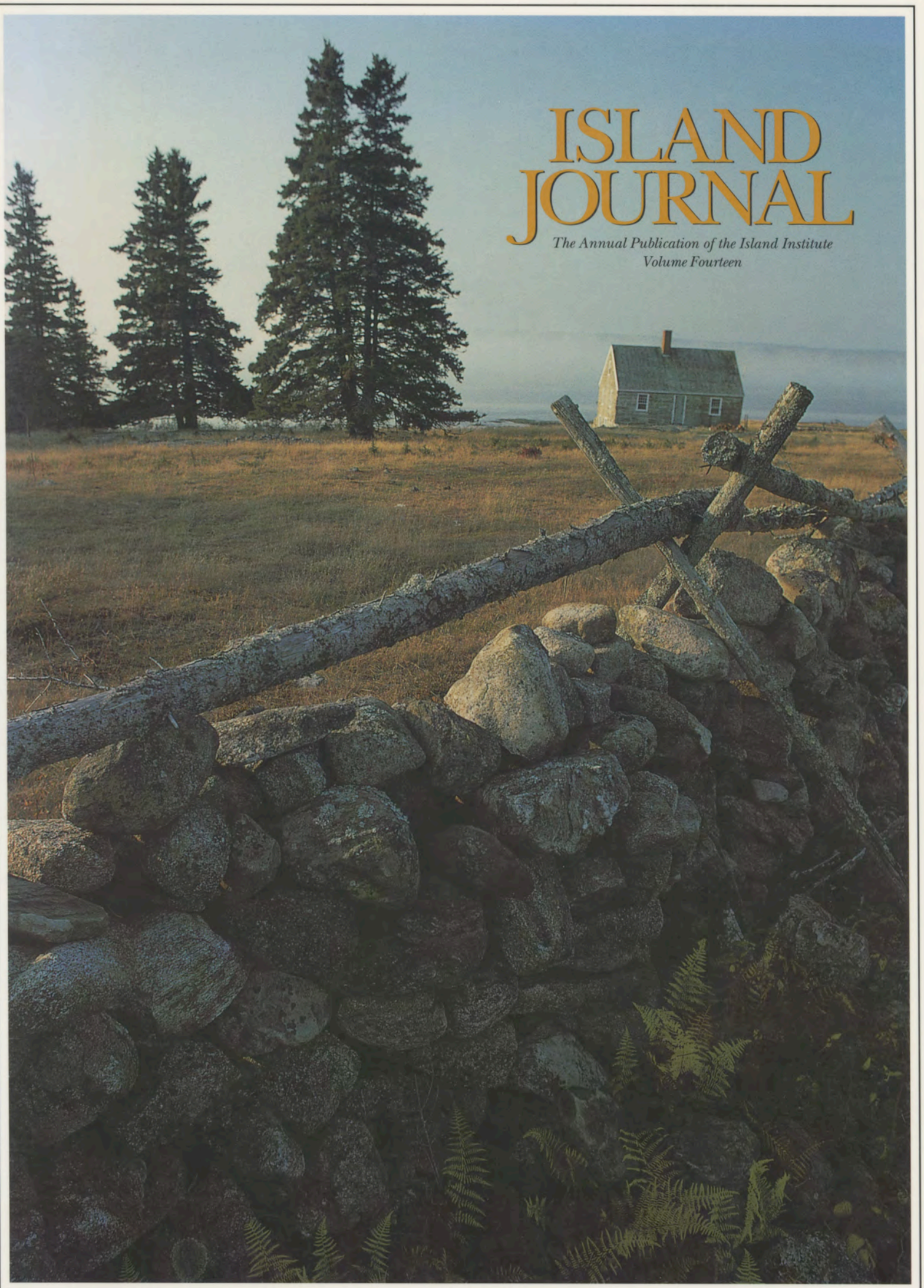

ISLAND JOURNAL

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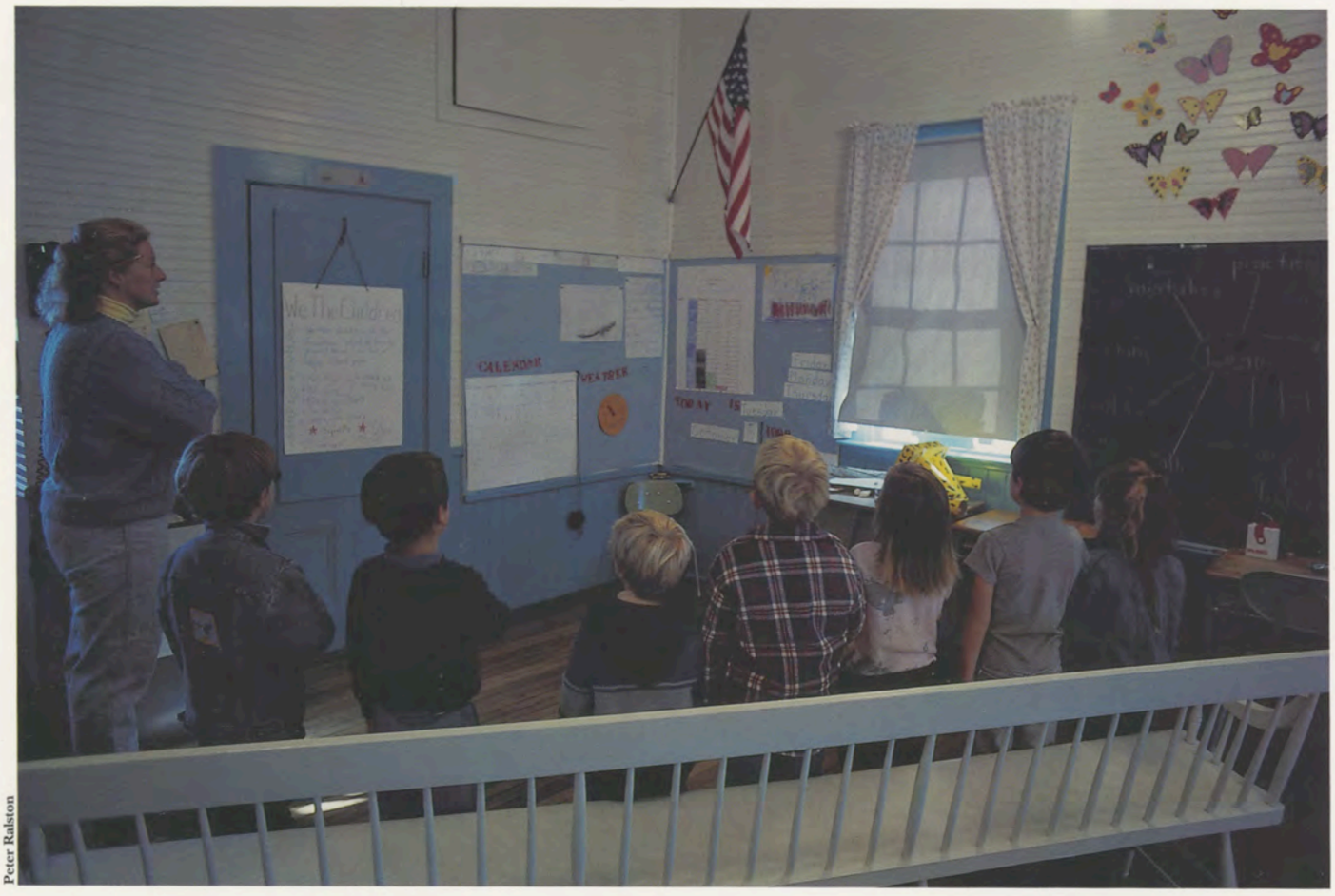

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Jeff Dworsky

To our readers

COMMUNITIES ARE fragile things, and the twentieth century has been particularly unkind to them. The destruction has been indiscriminate: small towns and downtowns; agrarian societies and religion-based cultures; assemblages of plant and animal species that depend on particular ecosystems; fishermen and farmers who have learned to make use of those species.

Worldwide, as the linked onslaughts of population, technology and human greed have worked their will, communities of all sorts have been obliterated, become extinct or found themselves so altered as to be unrecognizable.

Yet as old forms of human association are destroyed, new ones seem to appear. Suburbs, malls, the car culture and the Internet have replaced downtown, the corner store and the expectation that when we go out, we'll meet someone we know face-to-face. These days we are more likely to find others with common interests and values in cyberspace than on the street.

New communities replace old ones in the natural world too. Remove the urchins from an undersea area and a kelp forest springs up, bringing with it a whole new kind of marine community. Chase away the seagulls and Common terns show up to reclaim old nesting grounds. Catch all the cod, holds a theory in wide circulation these days, and lobsters get a new lease on life.

This issue of *Island Journal* explores three different kinds of communities. We ask what it means to live in a community of islanders. We consider the Gulf of Maine's island biological communities and what we have learned from them. And we explore the various marine communities that make up this same region's undersea world: What are they? How are they related to each other?

The world is a resilient place, and it has always found the community to be a useful model. Why communities survive and even thrive in the face of the forces we have unleashed on them is a story all of us — as members of the human community ourselves, and as stewards of the natural world — need to hear, again and again.

— *The Editors*

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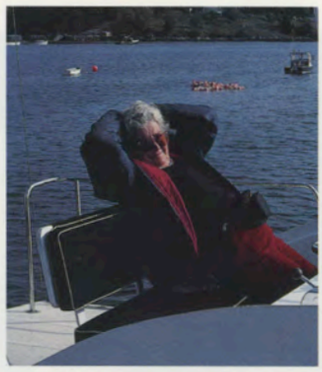

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Cover Photo by Peter Ralston

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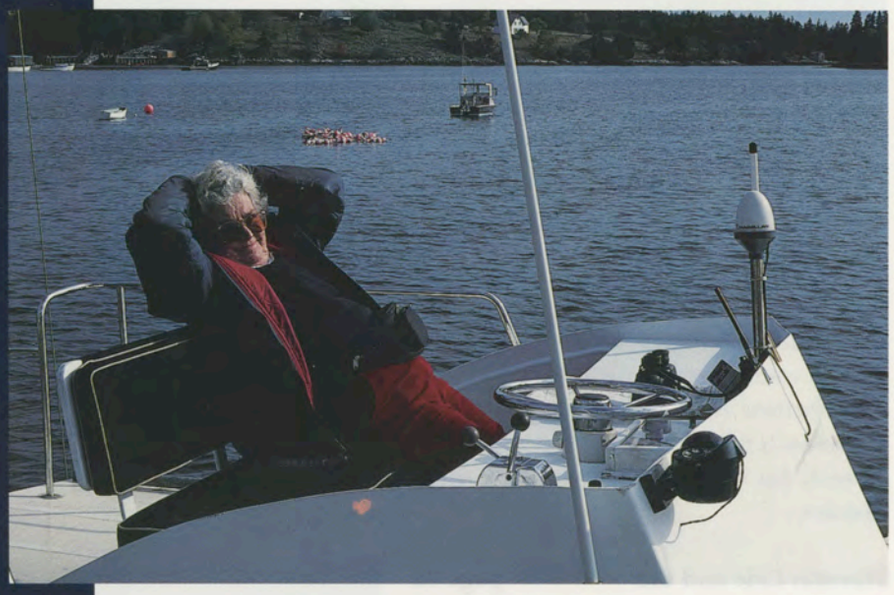
This fourteenth edition of **Island Journal** *is dedicated to Betty Noyce, who served the Island Institute as vice president of its Board of Trustees. She helped make possible the Institute's move to new quarters in Rockland last year, and in earlier years her generosity enhanced the organization's programs in many ways. Her death was a personal loss for many at the Institute including Peter Ralston, who delivered a eulogy at Betty's memorial service in Portland on September 23, 1996.*

A portion of his remarks follows.

— The Editors

In the Light

PETER RALSTON



QUERENCIA, IN SPANISH, means "the place which triggers instinctive belonging," and Betty Noyce loved the concept it represents. "Oh, that's just what Maine is to me," she told me when I first shared it with her. Her generosity — generosity of all persuasions — was a mirror, the reciprocal, of the belonging (and happiness) she found here.

Betty was a *querencia* for me.

Behind the Elizabeth B. Noyce of the big gifts, the endless meetings and headlines was, simply, "Betty," whose family and friends meant all the world to her.

I don't think any of the hype came close to giving her the pleasure she derived from being off "messing about in boats" with her children, grandchildren, or close friends. The little ones gave her a special joy and it was, in turn, a joy to behold that love.

Betty had her beautiful yacht TUMBLEHOME but equally loved to go off with friends on their far less comfortable boats to gunkhole the coast she knew so well. Some of my very happiest times were the two or three day trips she and I would take in the early spring or late fall of each year in RAVEN. We would poke into deserted coves and visit friends in some of our favorite working harbors and we would walk empty island shores. Aboard, she would read or do cross word puzzles, while I puttered. We would talk and talk and talk.

Peter Ralston (2)

I'll never be able to look at a painting again without wondering what Betty would make of it. We had a world of fun together going around at looking at paintings of Maine and meeting Maine artists, and it was always exciting when the phone rang and a familiar voice said, "I have a new painting, come have lunch right away and see it." She regularly — and usually anonymously — shared her remarkable collection with the public, and over the years added immeasurably to our cultural patrimony. She had a real eye for Maine.

She loved working on her Bremen property and high on her list of deepest pleasures was clearing land or building a stone wall with her special friends Barbara and Eric. Eric had worked in a few boatyards and fished before he came to work for Betty as caretaker a few years ago. He ended up becoming a valued friend of hers.

When he first came to interview for the job, Eric told me a few days after Betty's death, he was bristly and loaded for bear, expecting an arrogant or condescending rich lady who would likely lord her station in life over him. "Instead, I found myself looking at my own prejudice and discovered that she was the straightest person I could ever hope to meet," he told me. "All of us who worked for her learned about real trust and respect; she changed our lives." Betty had that effect on everyone she met. She had more heart than money.

As a friend you always knew just exactly where you stood with Betty — no doubt about that! She was a rare personification of the qualities we might all hold highest — fierce loyalty, absolute honesty, genuine compassion, quiet resolve and an incomparable sense of humor — all qualities of which she was unreservedly giving.

Three days after Betty died, my wife and I retreated to a friend's tiny island off Vinalhaven. On the run back ashore for her service I thought, from the helm, of all the wonderful times, adventures and sights Betty and I were able to share over the years. I thought how, as mariners — of the sea or of life — we must rely on the unwavering integrity of the aids to navigation we are given to guide us amongst the shoals, or when our vision is limited by a fog or by the dark of night. I thought especially of lighthouses, those stalwart symbols of trust, faith, vigilance and hope.

One of the brightest lights of the coast and of our lives has been prematurely extinguished, but a remarkable and graceful legacy of selfless and thoughtful caring will burn bright for a very, very long time. Let us all now do everything possible in our collective and individual powers to sustain that afterglow. It is by so doing that we will best honor our friend.

Quakers have a wonderful way of saying a final goodbye. Instead of saying, "I'll pray for you," they say "I'll hold you in the light."

God Bless, Betty of the Light.

Peter Ralston

EYE OF THE *RAVEN*

From the logs of the vessels of the Island Institute

PHILIP W. CONKLING

The Gulf of Maine was cooler during the summer of 1996 than any other summer in recent memory. June and July produced precious few blue days; and with dull gray skies obscuring the sun, the surface waters of the Gulf of Maine chilled the bone well into August. With the average water temperature almost two degrees behind what it was a year ago in July, the salmon at the Swan's Island fish farm were smaller in size, portending a reduced harvest. The slowly ripening summer season also set gardens back ashore, delayed lobster shedding for several weeks and contributed to a feeling that the seasonal loss would never be reclaimed.

But as is so often the case, what nature seems to take away with one hand is given back with another. The cooler waters pumping through the cod hatchery at Burnt Coat Harbor on Swan's were especially good for the tens of thousands of minuscule larvae that had been hatched from cod eggs, and these developed first into small fry and then into fingerling cod under the watchful guidance of Monica Cease and her assistant, Arthur Stinson. By the end of the season, the first batch of hatchery-raised cod was released into the Sheepscot River estuary to begin testing the feasibility of rebuilding localized cod stocks — bit by bit, bay by bay, in a manner similar to the way salmon have been released into individual rivers for decades.

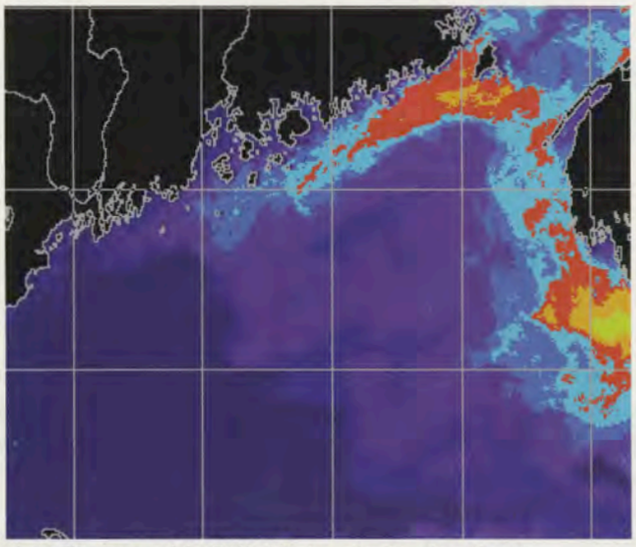
A year earlier, when large salmon were thriving in their ocean net pens at Swan's Island, warm summer waters had killed all of the hatchery's cod when they were barely a month old. Thus, what is good for salmon may not be so for cod and haddock and vice versa. Diversity is the one sure hedge in the Gulf of Maine.

The beginning of another summer season brings a mixed picture to island communities. Winters prune back the smaller islands so severely that one wonders at their amazing ability to regenerate themselves. Frenchboro, perennially the most susceptible to winter die-off, struggles back from the brink year after

year, but in 1996, Cliff Island and Great Cranberry also suffered substantial reverses. A fire destroyed the building of Cliff's largest year-round business, and the delays in the permitting process for its reconstruction loosed wave upon wave of uncertainty onto Cliff's vulnerable shores. On Great Cranberry, the galvanic effort of the island development corporation to purchase a wharf for economic development failed to come to fruition, and coincided with a rising tide of other difficulties — declining school enrollments, families moving ashore and a cloud over the future of the island store — that drove a stake toward the heart of the community's survival.

If Maine's island communities have a significance beyond the relatively small number of people who inhabit them year-round, if they are to be more than seasonal enclaves served by a highly competent class of caretakers, then the question of their future stares out ever more starkly from their rock-fast shores. This is a tricky question, because inherent in it is the danger that well-meaning but errant off-island efforts can cause all sorts of mischief and result in unintended harm.

But it is also true that none of us, nor any island, is an island complete unto itself. Friends and friendships, both given and received, across an ocean of different experiences, rekindle our essential humanity. And when one among us falters through misfortune, sickness, or simply the luck of the draw, then a hand, an encouragement, a lifeline skillfully offered can sometimes make the difference between continuity and extinction. A hundred years from now, just as today, surviving island cultures will give the region a distinction that no other place in America and few on the globe can replicate. And all these islands' friends will have done their small part to help.



A satellite image of the Gulf of Maine, showing the cold water "upwelling" south of Grand Manan on July 11, 1994. Nutrient-rich cold water cycles along the Maine coast, contributing greatly to the region's productivity. (NOAA CoastWatch, Northeast Node; image processing by Dierdre Byrne, Island Institute)

For a decade and a half, the Island Institute has been dedicated to a single idea, at once simple and complex: the special nature(s) of islands creates unique island cultures that have survived for centuries along the Maine coast, but their resources are increasingly finite and fragile and worthy of the consideration and respect of those who visit these communities.

More recently the Institute has advanced another simple proposition: the real and renewable wealth of the islands is still to be found in the water. Contrary to the impression left by reading the big city newspapers, the news is not all bad for Maine's working waterfronts, either on the islands or the nearby mainland. In 1995, Maine seafood landings were valued near a record $275 million — at a time when landings of cod, haddock, flounder and other groundfish had declined to volumes less than a third of earlier highline days. New fisheries and aquaculture landings, it seems, have more than made up for the decline. The year 1995 saw record landings for lobsters ($100 million for the second year in a row), for Atlantic salmon ($67 million), urchins ($47 million, down slightly from the peak of a year earlier) and shrimp ($17 million — also a record).

The reasons for the increases are complex and only dimly perceived, but they hint at important ecological relationships: even though the marine environment of the Gulf of Maine changes constantly on a day-to-day basis, what is truly amazing is the persistence of its most fundamental ecological patterns, despite the fact that we harvest a significant part of the biomass of the Gulf of Maine on an annual basis. Fishermen certainly understand when and where seasonal concentrations of fish and shellfish are likely to appear, this year or next; they bet their livelihoods and sometimes their lives on this knowledge.

But at the same time, it is unquestionably true that changes in one fishery can result in a cascade of effects on other fisheries. The intense urchin harvests of the past half-dozen years have reduced the pressure on kelps on which urchins feed; as a result, kelp forests have significantly expanded, providing additional habitat for shedding lobsters. The decline of Gulf of Maine cod populations, which used to appear in pre-spawning aggregations along the 50-fathom line in winter, accounts for some of the excellent shrimp fishing in recent years. These examples serve to remind us that the species found here are constantly confronted by new conditions, and that trends for one species are not necessarily trends for others. But it also is increasingly evident that until we improve our understanding of ecosystem dynamics in the Gulf of Maine (in which islands play a critical role as spawning and nursery habitat), our attempts to manage its bounty are long shots fired into dark and murky waters.

On FISH HAWK, Corrie Roberts, the Institute's newly hired sea station manager, crisscrosses the waters between Allen Island in Muscongus Bay and Frenchboro in outer Blue Hill Bay, sampling the water column to determine where and when blue mussels spawn in peak numbers. Blue mussels are still something of an under-utilized species in Maine with approximately 500,000 bushels harvested, compared to two million bushels of clams from along Maine's intricate coastline. In cooperation with Carter Newell, a biologist with Great Eastern Mussel Company of Tenants Harbor, the Institute is conducting transects among the islands of midcoast Maine to collect samples of mussel "spat" — the tiny mussel larvae that hatch from fertilized eggs. By locating optimal mussel seed production areas and linking them with prime grow-out areas among Maine's islands, it seems imminently possible to increase the opportunity for local fishermen to diversify their production without a taking a large risk in time or cash.

When FISH HAWK and Roberts are not traversing the midcoast on the mussel project, they have been making the run between Port Clyde and Allen Island, where a little-noticed but potentially significant green sea urchin research project is underway. Partly funded by Maine's Department of Marine Resources and partly by industry grants, an urchin diver and University of Maine student, Tim Dowling, has been studying the reproductive biology and feeding habits of the most economically significant new entrant to Maine's fisheries since shrimp were first discovered in the 1960s. Six years ago, the department did not even collect urchin landing data; in 1996, urchins composed the most valuable wild fishery after lobsters.

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Our own journeys into understanding the mysteries of the marine environment back in Rockland have been immeasurably enhanced by a trove of new images downloaded from sensors in space to desktops like ours, for the first time ever. It may seem counterintuitive, but to understand some of the important ecological features of the marine environment — such as the primary productivity contained in the annual phytoplankton bloom — the further from the surface of the Gulf of Maine we can go, the clearer its patterns become.

(continued on page 90)

LIVING THERE

In island communities, the most powerful lesson is the relationship between scale and human value.

CYNTHIA BOURGEAULT

IT IS SIMPLE and it is precious. Some are born to it. For others, it is an identity consciously chosen and, in some cases, fought hard for and won — the right to call oneself an "islander."

Strictly speaking, the term "intentional community" applies to a place like a commune, a monastery, or an enclosed culture such as that of the Amish, where people willfully come together with the hope of proclaiming and living out some set of values that are crucially important to them. While it may at first seem farfetched to apply this category to island communities, on closer inspection the criteria hold up surprisingly well — and in the process offer a telling commentary on where we members of the larger, end-of-century American society are in our effort to proclaim, choose, and live out the things that are truly precious to us.

From the first time I set foot on Swan's Island in 1972, I could feel it, almost welling up through my shoes: the call to a life that seemed wildly more authentic, more true, more compelling, than anything I could live back home in Philadelphia. I came full-time in 1979, and for something more than a dozen years Swan's Island was home. I lived, sailed my boat, built a home, raised a family, scrounged for a living — house painting, mowing lawns, teaching on the mainland, whatever it took. Every moment was precious. Still is.

For the past three years, I have lived in Colorado, next door to a more classically "intentional community" — Saint Benedict's Monastery, a small, Trappist contemplative community making its living through ranching and meditation retreats. The reasons I left Swan's Island are complex; probably the simplest bottom line is that my marriage broke up. I still own a house there, and may someday return. Meanwhile I draw gratefully every day on the skills and values that I learned during my time on Swan's.

Living within boundaries

An intentional community in the classic sense has finite boundaries. Here at the monastery they call it "the enclosure." You know when you're in it and when you're out of it. It is the geographical space in which the rules and values of the community hold sway.

A lot of people point out, quite rightly in some ways, that island communities are really not that different from small, isolated mainland communities: still populated by traditional New England Yankees with similar values of frugality, reticence and self-reliance. One of my mainland friends insists that Vinalhaven is simply "a little Belfast miles out to sea."

True, but there is that one all-important distinction: an island is surrounded by water. It has finite boundaries. Once the last ferry is in, everybody can be accounted for. And similarly, it is impossible to widen the radius casually — in the grand American fashion, to commute. Up the road from Belfast, in rural Waldo County, if the local one-room school closes, kids will be bused to the next town. Inconvenient but no big deal. On an island, if the school closes, families with school-age children must move off the island. Similarly, if the store closes, or a key employer goes bust, families without supreme self-sufficiency will be forced to leave the community. It is this element of finiteness that puts the distinctive intentional spin on the otherwise generic similarity to stock New England community life.

Islander interviews: Deborah Du Brule
Essay photographs: Jeff Dworsky

A body of people having common organization or interests or living in the same place under the same laws.

Safety

For some who come to islands, this element of finiteness translates into a sense of safety. Many newcomers, urban refugees, mention most powerfully the attraction of wanting a safe place for kids to grow up, where it's all right to talk to neighbors, where you know that wherever the kids are, they will be watched and okay. A place, moreover, where your own gear is untouched, where a natural respect for people's property and rights is more effective than any security system.

In all my years on Swan's, I never locked my home, and the keys stayed in the car. Our one local robbery was an island classic. Once when a neighbor, a fine-art collector, went away for a while, thieves came from off-island, broke into his house, and looted his collection. The sight of an unfamiliar van headed down his remote road attracted a neighbor en route, who went over to check out his house for signs of mischief while the van waited in line for the 1:30 boat. When the van rolled off the ferry in Bass Harbor, the state police were waiting to meet it. In a world where crime and violence seem to thrive on anonymity, that rootless world where nobody knows one's neighbors or cares, an island seems to be, and still remarkably is, a place where the high end of finiteness is a safety too rare in the world at large.

A place to belong

Deeper than fear, however, the driving motivation for many who come to islands, I believe, is the quest to find one's identity, a place where one belongs, with skills one can contribute. This sense of identity has both a personal dimension and a community one.

On the personal level, a good deal of the attraction of island life lies in discovering and developing skills in oneself: skills of self-reliance, ingenuity, that sense of being actually and personally in control of one's life. Her first winter on Monhegan, Mary Beth Dolan remembers, was a time of being thrown deeply back on her own resources: "All I had was a few kerosene lamps, no insulation, no running water. It was a very difficult time, especially when it gets dark at 4:00 p.m." As she gradually made her way, her former restlessness began to give way to the deep satisfaction of having carved out her own niche. "Have you ever been really restless and not sure about what you want to do?" she asks. "Generally, I don't feel that way any more. It's satisfying when things finally start to mesh. You've pulled things together. You fit. I have my place here in the community. There's a comfort in finding your own place somewhere."

For me, it was much the same experience. I arrived on Swan's Island with a Ph.D. and ten years of college teaching under my belt. But medievalists were not highly in demand on Swan's, so I started my working career bagging scallops at the co-op, then went on to mowing lawns and painting houses. Along the way, I learned precious skills: I could saw, hammer, replace soffits; could fix my car when it wouldn't start, sharpen a chainsaw, reputty a window, frame in a wall, lay a foundation — practical skills that made me feel connected and useful in a real universe. The pride I felt in my own self-sufficiency is more than just a vestige of my old tomboy spirit; it speaks, I believe, to a basic yearning in all of us to see the relationship between means and ends, to draw satisfaction from the work of our own hands and from living up to our uniquely human responsibility truly to tend a small piece of the earth that has been entrusted to us.

Solitude

If yearning for a sense of place is an intrinsic human condition, so also is yearning for a sense of solitude, which brings us deeply in touch with the numinous both around us and within us. Many people have spoken eloquently of this dimension of island life. "It's a strong spiritual place for me," says Cheryl Norton of her home of Gay Island. "My favorite place is at the far end of the island. It's rugged, wild — Mother Nature at her best. It's humbling and breathtaking." It is a commodity too rarely available in our urban culture.

Solitude is not just an outer reality but an inner one as well. Again by the fact that an island is finite, many of the usual distractions are simply unavailable, and for better or worse, one comes face to face with oneself. "Living on Islesboro in a *de facto* sense

JENNY CIRONE
Big Nash Island

"I got married at 33 and we lived on the island at first. We rowed back and forth to go to movies and such. I had always rowed ashore with my sisters. I never felt isolated on Nash. I had a wonderful life. There was always plenty to eat even through the Depression. And at that time, my father only got $35 a month for keeping the lighthouse. I bought the island in 1944.

I harnessed Tinky to a sled or a wagon, depending on the time of year, to haul coal up to the barn from the shore. I got this big idea to make a bit for her so we could steer her better like you would a horse. So I made a bit out of a chicken bone. It wasn't a very good idea. She bit it right in half as soon as I got it in her mouth.

I've had sheep all my life. When my father got rid of his flock, we brought up someone else's. We were always digging them out of the snow. It was a way to make money. Today, labor and taxes are so high. Twelve were stolen this summer. I love them, though. That's my life. I have 12 at home and 150 on the two islands.

I wanted the island because I was raised there. I traded some lambs for half of Little Nash. It's my home. There's no television or phone — just a CB. When I go out there with my friend, two to three weeks for lambing, there's nothing to bother us. It seems so that all your problems leave you. It's relaxing. It's the only home I ever knew.

I still go scalloping once in awhile and do a little lobster fishing — things I learned about on the island. You learned the hard way if someone didn't show you. I've been a lobsterwoman since I was ten years old. I had 140 traps around the island — no boat, just a little pod. I trawled before I got married. On the island, there was always good fishing. I fished with my husband after I was married."

requires a certain amount of introspection," philosophizes islander Steve Miller. "Some people aren't interested in taking a look inside. These people come, but they don't last."

"The isolation gets to everyone sometimes," admits Tom McKibben, who taught school on Matinicus for six years. "You learn to deal with it." It is the forced coming to terms with oneself, one's own needs and lacks and craziness, if one can stand it, that is the most powerful shaper of character in island community.

And not just on islands, but in monasteries, too. The monks here at St. Benedict's are using much the same means to strive for much the same end, recognizing its crucial human value. "I have discovered," said the seventeenth-century philosopher Blaise Pascal, "that all human evil comes from this, man's being unable to sit still in a room."

Community

Perhaps the most powerful magnet drawing people to island life is the tangible sense of belonging to a community, a finite universe where folks watch out and care for one another. "I never knew people were so nice," exudes Ruth Fox of Vinalhaven. "You can't turn your ankle without being snowed under with casseroles!" And reciprocally, this finite universe is a place to share one's gifts. Many who have come to island communities have made generous donations of their time and resources: founding libraries and historical societies, serving on boards, helping out at the school, sometimes taking key roles in island conservation or economic development initiatives such as the Islesboro Islands Trust or Island Aquaculture on Swan's Island.

For me, there was always a more philosophical dimension to this as well. Knowing your place in community also meant watching the progression through time. The kid whose mother I tutored when she was pregnant is now old enough to buy my house; several others whom I watched enter kindergarten are now homeowners and civic leaders. Similarly, the old generation dwindles. When I arrived on the island back in

MARY BETH DOLAN
Monhegan

"There aren't a lot of full-time job opportunities on Monhegan. I have a lot of part-time jobs — librarian, assessor, the craft co-op. Everyone I know has a minimum of three to four jobs. You have to invent things; you have to enjoy your own company and be pretty resourceful here.

There can be difficulties in finding a place in a community as small as this, and some people don't fit in. People's livelihoods, politics and economics all get intertwined and it gets convoluted at times.

I can walk up and down the same road and never get tired of it. In the village, it's comfortable. I get tired of a city. The ocean's important, too. I need to be near the water.

Have you ever been really restless and not sure about what you want to do? Generally, I don't feel that way anymore. It's satisfying when things finally start to mesh. You've pulled things together. You fit. I have my place here in the community. There's comfort in finding your own place somewhere. It might be difficult to find the niche, the occupation. But once you get it, it's so rewarding. I feel as if I'm a part of Monhegan — I'm tied in here.

You have to make a choice to live here. You run out of money or you get sick and you wait for the mailboat to get you to the mainland and you feel even worse on the boat, and you ask yourself, why am I living on an island?"

REBECCA DRURY
Vinalhaven

"I graduated from high school with only 15 students. Coming here to Vassar has been very interesting. The fact that I grew up on an island always sparks conversation. People think it's weird to take a ferry to get anyplace.

I'm an island girl, born and raised. It's shaped the way I am. It's given me a common-sense intellect — dealing with boats in winter, the wind — as opposed to dealing with subways and buses. Students at Vassar grew up in such a different atmosphere. Many of them are from cities. They want to see the island.

The first thing you'd do in the morning was light the wood fire. Then I'd light a candle or kerosene lamp to get dressed for school [on Vinalhaven]. I had to get up early depending on the tides and the weather. I'd usually get there earlier than other kids, but sometimes I wouldn't make it until 10:00 because of the tides. If the weather was too rotten to make the trip across, Dad would say, "there's no school today."

[Those experiences] contribute to the way I look at life, in a common-sense way. If I get into a situation, I look for the most important thing to be done. Not that everything was melodramatic, life-and-death. But the way we lived and our relationship to the island and the water contributed to a level-headedness in looking at and dealing with life. It's made me who I am. Vinalhaven has, too, in terms of dealing with a small town.

It's a good place to raise children. But I think young people should experience more. My parents are both "imports." My dad is from Massachusetts; my mom is from New Rochelle, New York. So I don't come from generations of islanders. People who have those generational ties have a different perspective than my parents and I have. My family made choices that were strikingly different from most islanders. The message in our house was "You'll go see the world." I've traveled to Russia, Europe. There was never a question of my not taking advantage of experiences like that. It made me more of a well-rounded person and it helped me get into Vassar, which I consider a big honor.

My parents are my best friends and I'm proud of that. I never went through the I-hate-my-mom phase. From the seventh to the ninth grade, the friends I did have hated their mothers; they fought all the time. They saw me as different for liking my mother. I saw myself as different and it was hard.

It's hard to be different in a small community.

On the other hand, those experiences produced a strong sense of self and I finally accepted that. None of those kids were bad: I just never felt like I was part of the entire group — never felt like I was close to any of them. There were only one or two that I could converse with. Green's was the physical difference between us. The other was the type of family I come from. My parents are more worldly, well traveled. They're very learned and natural people. Green's came into the family through my paternal grandfather, who was a biologist at Harvard. When pieces of land came up for sale, he'd purchase them. My grandparents spent summers and autumns on Green's conducting nature studies. My mom's family is city-oriented, so she's always had an awareness of the outside world.

My parents made the choice for a simple life, which is why they moved to Green's. They weren't born to it. I have family all over the country, the world, whereas most islanders have family on the island, concentrated in one place, especially when they have long generational ties to Vinalhaven. It's an obvious connection to the island. If all my family lived in one place, I might never have traveled. It's yet another thing that made me feel so different — traveling a lot, visiting cities, museums. My parents made the choice to live on Green's but never wanted that decision to hamper our development. When they had my brother and me, they knew they'd have to move off Green's so that they wouldn't be imposing their choice on us.

You can't hold on to grudges in an island community. I never found the notion of getting along with everyone stifling. It breeds a sense of tolerance."

the seventies, the two grand dames of island community life were Marguerite and Nellie, a pair of gray-haired widows who single-handedly ran the Rebekahs, the women's auxiliary to the Odd Fellows responsible for all the baked bean suppers, breakfasts and dances that kept island social life going. It was fun at the dances, once things got loosened up, to watch the two of them kick up their heels together.

I don't remember who died first; they are both gone. And as their absence began to make itself felt (especially in the church, of which they were staunch members), many younger island women who ten years ago would have turned up their noses at such quaintness now realize the mantle has fallen on them. A new generation is cooking, selling tickets at the dances, teaching Sunday School; and community goes on, with a life of its own. In this minute, excruciating finiteness you see the real scale of things, the passage through time that is the other component of our identity here on earth, again marked and honored in community. I will never forget that one ferry crossing, where the car in front of me carried a young mother in labor, and the ambulance behind me carried the ferry captain, dead of a heart attack. In a strangely public way on an island, all our human passages are tied together.

Some notice the other side of community life: that it can be narrow, intrusive and coercive. As Rebecca Drury points out, with marvelous candor: "You have to deal with politics. If you alienate the only plumber on the island and your pipes freeze, he won't come back. You have to be careful who you get angry with. Inevitably they're closely connected or related to someone else. If you get a reputation for being a jerk, it will color the way people will deal with you." Dan Fernald, who grew up on Islesford, notes a certain "blindsidedness" and "lack of choices" as part and parcel of island life, particularly in the education of its young. My own daughter Lucy, now 25, still remembers the trauma of her first day of school in third grade on Swan's Island — "When I got there, all the other kids ran out on the playground and hid." Although she eventually made friends, the sense of being an outsider never left her. Not until high school on the mainland did she feel reunited with her own kind.

There is a certain truth to Lucy's experience. My own sense is that the dance of island community, as Marguerite and Nellie so strikingly illustrated, is just that — a dance, with its own distinct steps and moves, all intricate and rewarding. People did not see you as much as the dance, and inclusion involves dancing these steps, and only these. For those wishing a deeper sense of community — beyond neighborliness, to a real sharing of hearts and minds — I myself discovered the beautiful, shimmering image of island community to be a mirage. Perhaps "mirage" is too harsh; it is perhaps more fair to say that there is an outer circle of community and an inner one. If one's sense of belonging is satisfied at this outer level, belonging in community is fairly straightforward.

The inner circle is penetrated only by similitude. There must be an absolute, perceived congruence of values and lifestyle before cordiality opens to intimacy. These values are in essence those of rural, working-class America, made that much more intense by the factors of isolation and inbreeding. For the newcomer this poses a delicate — and frankly, usually insurmountable — Catch-22 because the very independence and sense of spiritual quest that enable one to resettle oneself on an island are in themselves slightly off the map of island values, where neither meaning nor identity is self-determined.

Acceptance

The native-born islander comes with a birthright as special as any ever to be conveyed, something tantamount to an inviolable place, unconditional acceptance. Island tots are community property, really; everyone knows their names, says, "Hello, deah," and fusses over them at the store. Only by really seriously "being a jerk" is that birthright ever jeopardized; and even then, one remains a native son or daughter.

For those coming "from away," acceptance must be earned; a place in the community must be won. Some

ERIC HOPKINS
North Haven

"The island has changed a lot from when I was a kid to today. It's a lot more homogenized, like any contemporary society. Some of the native identities are kaput. The ferry has unified things, as has television, the Internet; we're hooked onto the [power and communications] grid. People come and go every day. It's not as isolated anymore.

When I was growing up, I went to school in Rockland. Everyone called North Haven "the rock." Part of what I've always liked is the isolation — knowing the boundaries, knowing where I stood.

Islands are finite. You know where the edge of the earth is. You know where your boundaries are. You know where you stand."

CHELLIE PINGREE
North Haven

"I learned a lot about politics from living on the island. It's easier to see and become part of the struggles in a community with only 350 people and islands tend to be real activist types of communities. When we fight we still have to figure out ways to get along with each other. Politics on islands can be nastier than anyplace else. It's like fighting between brothers and sisters — people know which buttons to push, your strengths, your weaknesses.

I ride the ferry for an hour just to get to the mainland. A certain amount of sacrifice comes with the opportunity and privilege of living on an island. The [logistics of traveling] are much more complicated. I don't get to come home every night and be with my family. I could have moved to the mainland when I got in the state Senate, but my kids go to school here, my friends are here, my support is here. The advantages far outweigh the disadvantages.

Christopher Ayres

There's a huge rite of passage [when you move to an island]. Islanders are very protective and very suspicious of outsiders. It's a way of protecting the community, traditions and values. If you prove your intentions are good and that you share the community's values, people will accept you. It's a bit of a paradox really. It's hard to move here to begin with and it's even harder to move away."

Dean Lunt
Frenchboro

"There was no great revelation to move off of Frenchboro: I just went to college and went after a job. But I loved it there. I still do. I never felt the suffocation or the desperation to get off the way some kids from islands felt. I'd love to go back there if I could make a living. But even now, I haven't accomplished all I want to do.

If you grow up someplace for 22 years, that place and the people around you shape how you view things in your formative years. Even though I live on the mainland, I'm an islander. I always will be. Your identity is more pronounced if you're from an island because islands are more unique than any other towns. The lifestyle's so different. There aren't any subdivisions or strip malls. When I lived on Frenchboro, you didn't often leave the island's boundaries.

Frenchboro is less isolated now than when I was growing up. There were no phones to the mainland until the early 1980s. At that time the ferry came only twice a week.

You gain or inherit a sense of community when you live on an

island. A lot of towns don't have that anymore. You gain an identity from an island. Each one's different. But you always have that unique identity to draw on. There's also a sense of security on an island — very few outside forces affect the community. Frenchboro has one harbor and most of the houses ring the harbor. If a boat comes into the harbor, you know it: you know who's coming and going. It's safe. On the island, I never had any boundaries from the time I could walk.

I still consider Frenchboro my home no matter how far I travel. Most of my family is there. Anytime you have a group of 40 people, by definition, you don't have a lot of diversity. Then again, some people don't consider the State of Maine diverse. Even though I've been out of Maine for 8 years, I still consider myself a Mainer. But I consider myself an islander first."

newcomers, I notice, wear this very lightly, while for others it becomes almost a grail quest to have the mythical "they" confer this sacrament of belonging to "us."

Whether perceived as hard or easy, the challenges to acceptance are true. But from what I've seen, there is nothing particularly mythical about it; "being accepted" is empirical, much more so than people would like to believe.

The system of acceptance is basically pretty straightforward if one keeps in mind that there are three kinds of people who live in island communities: people who have their act together, people who keep their act together, and people who don't keep their act together.

People who have their act together have resources and use them appropriately. I am not talking just about summer residents and well-heeled year-rounders who made their money elsewhere. I am thinking primarily of the successful island families: the fishing clans and other established entrepreneurs who are in a position to buy the new boats and state-of-the-art equipment, or to underwrite new ventures like an island lobster pound or sawmill. These are the pillars of the community, the ones with the new shiny new pickups, the well-kept homes and the resources to donate generously to church and community.

People who keep their act together, while not overly abundant in their resources, are capable, resourceful managers whose lives are moving slowly ahead. These include the young family who started out living in their foundation and now have the second floor on their house; the hippie lady from away who seems to have gotten a sweater-knitting business together; the homesteaders who finally got the new siding on the house and the new boat that doesn't leak anymore.

People who don't keep their act together are always running at a deficit. They are the ones with the leaky boat that breaks down, the car that always dies on the way to the ferry, sometimes in the middle of the road, the house patched and jury rigged, with the stovepipe sticking through the uninsulated back wall, the tools a disaster waiting to happen, the kids with constant runny noses and ear infections.

People who don't keep their act together are costly to the community — precisely because of this most powerful feature of island life, the stand-by-one-another-ness. That leaky, broken down boat will have to be towed in, and *will* be towed in, at the expense of someone else's fishing day. The carpenter working with the old dulled table saw who catches his sleeve will have to be carted off-island to the hospital. The new resident who takes his runabout miles offshore and can't get the engine started again will have to be rescued. People who are lazy, careless, inexperienced, "jerks," or in various ways attract bad luck, are hazardous to the community. If they are native born, the burden will be borne, though not without sighs. If they are "from away," their days on the island are likely to be numbered.

In 14 years of living on Swan's Island, I cannot think of a single exception to the rule. Those who come to the island with their act together, who pay their bills, are reasonably handy, and are willing to play by the rules of the community, will be duly accepted into

the community (the outer circle of community, anyway), provided they learn quickly enough not to talk too much, quote experts from away, or throw their weight around.

For those arriving on the island without two pennies in their pocket, the real route to acceptance in the community is to become a member of the group who "keep their act together." This, rather than personal appearance, political or sexual preference, or religious affiliation, seems to be the real key. In short, the drill is simple: the house must be slowly gaining, the boat and/or other vital equipment must work, and there must be reasonable, measured progress toward those Yankee values of self-sufficiency and tidiness. If these criteria are being met, the rest will slowly fall into place.

Sometimes the language is interesting and subtle — like so much of island life, a matter of gesture and innuendo. The watershed moment for my ex-husband, John, the island house-painter who wanted to be a builder, came the day he got rid of his old VW

ELDON MAYER
Chebeague

"As young people begin to have families, there's hasn't been much there on the island. They've been tempted to move off islands in general. In the 1920s, people might have been happy or unhappy there, but it was all they knew. Today, shopping centers, malls, entertainment, the ease of getting what you want virtually whenever you want something on the mainland has enticed a lot of young families off islands. The communities are so fragile.

Some people feel a strong calling and they become ministers, teachers. Some live in a community all their lives and never get involved. I've been fortunate in having a reasonably successful career and I feel the need to give back to a community that's meant a lot to me and my family for generations. Chebeague is a very special place. I consider it my emotional home.

I was involved in the inception of the Chebeague Island Recreation Center project after year-rounders and seasonal residents were canvassed and said that the island could use it and specified what they wanted in it, like a swimming pool. There was special interest in providing a teen center. There's concern about keeping them away from the negative things kids do and a desire to provide them with the opportunity to participate in wholesome activities on the island.

One of the most interesting things about the recreation center is the degree to which the community has responded. Instead of bake sales, rummage sales, that sort of thing, a group of about 70 people — which nearly amounts to each family on Chebeague — went out and got contributions totaling $400,000. An amazing feat for a community of our size. The island has really pulled together — the campaign to fund the recreation center has done something to pull the island together in a way that nothing has done before.

I was trying to wind surf one year. I kept falling off and getting back up, and was really getting tired. I found out later that one of the lobstermen had seen me struggling out there — getting exhausted with the cold and the waves — and he had given up several hours of fishing to keep an eye on me to make sure I was okay and didn't get into any trouble out there on the water. I never saw him."

van and bought Wesley Staples's Ford pickup. Almost overnight he had his first "real" construction job and not long afterwards was offered the position of island Code Enforcement Officer. For a long time we both thought this was because the islanders had disapproved of his "hippie leftist mentality" as evidenced in the old VW. I now believe the matter was a lot simpler: the old van looked unreliable, and frequently was. It conveyed the ambiance of "disaster about to happen." The truck was conventional, solid, rigged up with a toolbox and ladder carrier in a way that was recognizably familiar to islanders. It was a clear signal that John was ready to bite the bullet, to commit himself to "keeping his act together" on island terms.

JANICE HARVEY
Grand Manan

"On islands, there's very much an extended family and extended community relationship. The family is the beginning of it, but it extends to the broad community. I don't miss that because I've never lost that connection. I've never tried to create that anywhere else because I still have it on Grand Manan. I never really left. I think it exists for most people wherever they're born and raised.

What islands do and what Grand Manan has done in a significant way is develop a sense of clan. It can be quite nationalistic. There's a sense from a number of people that it's the only place on earth. That sense of security can also present closed-mindedness and, to some extent, a closed society. Some people break into it. But you're never really a Grand Mananer unless you're born there. It's not a place you can easily adopt or that easily adopts you.

Being from Grand Manan is like a brand. It's a place apart, different, unique. People from Grand Manan wear it on their sleeve. Maybe that's an island thing. Grand Manan is part of who I am. I enjoy being identified by it.

We tend to romanticize islands a bit, and, while they're definitely unique communities, I don't think there's anything inherently better about them, just different. They have security but they also have some very special challenges they have to face. There's a certain amount of isolation in their world view and you have to work at overcoming that. (Of course, the advances in technology make island living less isolated than it once was, and working on an island becomes much more feasible. Having access to fax and e-mail and Internet services, to a great extent, brings the world to your door.)

On Grand Manan, people aren't often challenged to question the status quo. In urban centers, there are constant challenges.

People on islands sometimes feel the world begins and ends at their shoreline. The shoreline is the boundary. It's a secure place to be, but there's a danger of letting parochialism set in and perhaps a false security on some levels. The challenge lies in getting beyond that, in finding a place in the world where islands sit in the bigger picture and feel comfortable with it.

My husband and I expect to move back to Grand Manan when we retire, when the need for community and security outweighs our need for mainland work and all that entails. There was a time in my life when I had to leave to pursue my education and career interests, and there will come a time when I will want to go back — when the limitations of island life are less important and benefits more so."

Non-birthright islanders who simply cannot keep their act together on the physical plane will eventually leave. It may take a while (12 years, I think, is the record on Swan's), but eventually the going just gets too tough, as the pattern of mutual disillusionment, once set in motion, makes even simple tasks increasingly difficult.

Initiation

Out here in the intentional community of St. Benedict's Monastery, aspirants to community life go through three stages — postulancy, the novitiate and simple vows — before making their lifelong commitment. In some ways, I am struck by how well this pattern transfers to those making their commitment to island life.

Whatever form the postulancy period takes — that initial breathless excitement or idealism that casts one up on the beaches of an island — the novitiate gets underway in earnest with the first making it through the winter. Those first couple of years will test the depth, realism and resiliency of the original commitment. As the days grow short, the weather raw, the winter endless, as tempers fray and distractions dwindle, the would-be islander will come face to face with the reality of island life and with his or her own internal resources. "It's relatively common for people to romanticize island living," Steve Miller observes. "It's wonderful for a while, but they leave after a year or two. I think it's partly due to the inability or lack of interest in looking into yourself."

The novitiate is also a time for what the monks call "formation." Under the care of a wise elder, a novice — if he is alert and adaptable — will catch that he is being molded to a basic pattern that allows for survival in close community. He will learn to talk very little, to listen first and hard, not to ventilate his opinions, to be alert to gesture and innuendo, and to submit his own self-interest to the greater needs of the community. These are not only virtues in their own rights, but survival skills for both the individual and the community.

All newcomers to island life who present themselves for community membership will be formed in essentially these same virtues, either gently or with the iron rod. I remember Tom Cabot's favorite tale on himself. When, in his mid-eighties, this renowned Boston industrialist, philanthropist and cruising man decided to "swallow the anchor" and settle on Swan's Island, he found himself mightily displeased with the price quoted by the island electric co-op for running the five miles of underground cable out to his place. Hunting about in classic Yankee fashion, he turned up a bargain load of cable in Indiana. David Honey, the co-op manager, refused to lay it, claiming that its inferior metals would quickly corrode in the island's iron-rich soil. Tom Cabot threatened lawsuits. David Honey heard him out, then succinctly responded, "And *when* did you say you wanted your power hooked up, Mr. Cabot?"

"That old Yankee had me over a barrel, and he knew it," chuckled Tom Cabot admiringly. There are elders like David Honey on every island, those who have lived here successfully, who hold positions of community respect and trust, and on whom the mantle falls to shape the newcomer to the way things are done here. The novitiate goes along swiftly or slowly and is accomplished when the newcomer finally completely understands that whatever outside connections he/she may bring — brains, wealth, prestige, Nobel prizes, high-placed friends in Washington — are useless currency until one has learned how to negotiate successfully on island terms. People who refuse or are too thick to learn this lesson will be sidelined — if necessary, forcibly — until they either smarten up or leave.

Once through the novitiate, one is really, for all intents and purposes, "an islander." The term can be claimed and proudly worn. One *lives* here, one shares in the community, knows and respects its rules, is carried by the mutual sense of belonging. From here, the lifelong profession — solemn vows, as they call them in the monastery — happens almost noiselessly, one year simply following another. In the words of the old joke, "Lived here all your life?" the tourist asks. "Not yet," replies the fisherman.

Leaving

For some, however, the time of being an islander is a season of one's life, not the whole of it, and with curiously few exceptions, this season seems to be give-or-take a dozen years. One of my Isle au Haut friends forewarned me about the "12-year meltdown," when people who look like they've settled in for keeps suddenly self-destruct. I didn't believe him at first, but since in my own case this was so, I have examined this statistic carefully and wondered what common thread there may be. In a way, my work had all been done: the initial acceptance earned, the house built, an easy, steady pace established with the community. Even when the divorce happened, it didn't particularly jostle things: island communities seem strangely wise at absorbing personal transitions. With fair ease, a new place opened up, and for two years I continued on with it.

SHARON MARR
Long Island

"The island's my heritage. There's an inner strength in the people here that, through history, has helped them meet new challenges. The people have bounced back from each of those [political and economic] challenges stronger than ever.

On Long Island, volunteerism runs rampant. People are very supportive of the schools, the recreation center, aid programs. They're all run by volunteers."

Christopher Ayres

In my case, the first wake-up call came during that transitional time, after I had sold my share of our house to John. Between homes, renting a place off-island and needing one night to go back to Swan's to attend to some details, I suddenly realized that after more than 12 years of living on the island, there was *not one person* I'd feel comfortable calling up and asking if I could spend the night.

It's not that the islanders would have refused, if I'd asked. But I knew that the asking itself would be awkward, that my presence at that level of intimacy in their lives would be an infringement of the comfortable distance between us, as when someone stands too close to you and invades your space. During the two years in my second Swan's Island home, on the Minturn Loop, a tight little island neighborhood, I could watch my neighbors at close range through my kitchen windows. Pickups would come and go; islanders would gather around the kitchen table smoking, drinking coffee, maybe playing cards, the VHF always on, occasionally squawking out the news of fishing grounds and people's birthdays. In that form, island lives — the intimate hopes and passages — are known and shared, within that inner circle of island community. I belonged to the outer circle. As long as my own inner circle of support, my marriage, remained intact, this distance did not matter. Once I was alone, it began to matter more and more.

Even so, I continued on for another two years. But the crowning blow came in the recognition that throughout this time I was gradually sinking into that category of "people who don't keep their act together." With a tiny, "fixer-upper" house, the tools at John's, and barely enough money to hold life together, I saw myself more and more slipping toward that "ward of the community" status: the one who must be watched out for, compensated for, who cannot afford to fix things so they will really work. Unwilling to subject either myself or the community to that slow drain, I left. It was that simple.

Leaven in the lump

It is a mixed bag emotionally. Anything worthwhile and difficult always is. But as I listen to the stories, the words, the hopes, of those who have stayed and those who have left, I feel the saga of something very moving being attempted — something very humanly significant. From these many folks who have voted to cast their allegiance with a small scrap of earth in the sea and the folks already floating on it, there are lessons to be learned of import to our wider human culture.

The most powerful lesson is the relationship between scale and human value. In contrast to the predominant culture, which tells us that the meaning of life is to get, to satisfy, to consume, to possess, island community says that real meaning is to find a place, to put down roots, to participate, to serve. If the culture tells us our goal is to be fully an individual, to grow to the max, to "do our own thing," island culture suggests that the only sustaining identity is ultimately *relational* — in a community, in time — and that growth is not by maximizing, but by pruning, like the strawberry vine, so that real blossoms and fruits emerge. And in contrast to the sense of self formed in a society that is fast-paced, crowded and sprawling, island identity is a fierce, tiny particularity, grounded in a finiteness, surrounded by solitude and face-to-face with the rugged force and beauty of nature, that reminds us of our true place in the scale of things.

For whatever shortcomings, living on Swan's Island was the most profound and formative experience of my life, and wherever I may be, I will never leave it behind.

As in so many ways, islands continue ahead of their times, as the bellwether and intense laboratory of changes that will be felt. For me, the most powerful story here, and a fitting conclusion, is the story of Chellie Pingree. In 1970 she arrived on North Haven, a kid who had joined the counter-culture, knowing nothing, living down the end of the dirt road with husband and babies...struggling for

EARL MCVANE
Cliff Island

Christopher Ayres

"One negative thing about teaching at an island school — which is also the biggest difference between teaching on an island and teaching on the mainland — is that you usually don't have anyone else to talk to. Each day, there's no other professional to share things with, to share your day with, good and bad. On the mainland, you can go to the teachers' room and commiserate, empathize, share ideas and experiences. There was always a sense of comraderie which you can't get here.

You have an opportunity to be very creative on an island, as long as you follow the city's curriculum guidelines. For example, we made underwater viewers to observe plant and animal life in the ocean as part of the kids' oceanography studies. They had to make the viewers themselves, which is unique in a school setting. We've also read My Side of the Mountain, about a boy who lives in the mountains of New York on his own and lives off nature. The kids decorated the schoolroom like the outdoors, to create the environment this boy lived in. I brought in deer and bear hides — things the boy used in the wild. On the mainland, how thoroughly can you go through a reading book, much less decorate the classroom to imitate the environment of the main character?

As far as the subject matter, we cover mostly the same things. On the island, you can cover some subjects quicker. And if kids have an interest in something particular, you can cover it in more detail.

As an island teacher, I've got the time to tap into the kids' knowledge because I get to know them more intimately. I had twins who knew everything about shells, for example, and we incorporated their knowledge into a hands-on learning experience for the entire class.

When you're in need, islanders are there. It makes you feel good about the community. There have been lobster boats that have gone up on rocks, and people have stayed up all night to help patch them up, right them, and make certain that they float on the next tide. It's a nice place to live where you can leave your door unlocked. It's safe here."

friendship, acceptance, to find a place, to gain skills. Little by little, her crafts evolved into a successful business, and Chellie found herself graduated to one of those people who keeps her act together, belonging and more and more empowered in her community. In 1992, this underdog launched her campaign for the state senate, and won — and won again in 1994 and in 1996 was elected senate majority leader, one of the most powerful voices in the state. And yet, as Chellie points out, it is her vision of community, fueled and formed in island life, that, when carried beyond North Haven to the wider community, fills voters' hearts with a sense of right, and "yes, of course, that's how it ought to be." It may be, that for us, as for pen-raised cod, the real value of our intense island experience is that we are prepared to set these values loose again in a larger world, to restock the sea of our wider human community with values pushed almost — not quite — to extinction.

Tom McKibben
Matinicus

Christopher Ayres

"My experience on Matinicus was the reason I found a job on the mainland — because of my special-ed background and multi-age teaching. It got me into doors for interviews that I might not have gotten through and I got the job I really wanted.

On the island, you're the whole show. I had to provide everything, ideas. It was good and bad. There's a lot of freedom, but you're always a little nervous about doing things correctly.

One student on Matinicus was very interested in boat engines, so we spent part of a year taking apart a lawn mower. That kind of individual teaching is more difficult to do in an elementary school on the mainland. The class size on Matinicus varied between four and 11 students, kindergarden through eighth grade. That aspect — the wide age span — is harder. But fewer kids in class make certain things easier.

I miss being able to wander around the island, explore it. It's beautiful, remote. It's harder to do here. I miss a lot of the people. I miss being part of the community. People were always looking out for you, ready to offer you advice whether you wanted it or not. It was like being part of a family. I met my wife on Matinicus and leaving was really hard on my her, but she wanted to expand her horizons. There are certain limits out there. You know that going in. But there are lots of positives in living in a small community. I looked at it as an adventure and approached it with an open mind.

Teachers seem to have a greater impact on a small community. One advantage for me was being able to stay for as long as I did. People knew me, knew I'd be around. There are teachers in mainland schools that have tremendous impact, too. On an island, it seems greater because of the size of the community. I feel good about my impact there. I got to see kids who started in kindergarten go through the fifth grade. It was remarkable to see how far they had come in those six years. It was an unusual opportunity.

I would advise a new island teacher to pay attention to the community and have a lot of fun."

Going "Up" to School

Some island commuters start at an early age

FRANCES LEFKOWITZ

Photographs by Christopher Ayres

It's A MISERABLE day for a boat ride. At 7:15 in the morning, it's dark, cold and threatening to snow. Clouds cast a gray pallor on the water and Peaks Island's bare trees, a grimness mirrored by the industrial gray of Fort Gorges and Portland's waterfront, even the battleship gray of the ferry MACHIGONNE.

With the precarious timing of the young, a group of seventh-graders rounds the corner just as the boat pulls into the island dock. Oblivious to the weather, the kids join others already lined up at the dock, wearing oversized backpacks and mingling with the nine-to-fivers in suits and heels, house painters carrying thermoses, teenagers with green hair and pierced faces. The ferry, with a capacity of 350, has standing room only, and kids are shouting with each other about homework, basketball practice and what was on TV last night.

"It's like baby-sitting," says the woman selling doughnuts and coffee at the makeshift snack bar on the lower deck. "The middle school kids like to horse around. The high school kids stay to themselves, unless they're instigating the younger ones." If they get too rough she calls the deck hands, who may or may not call the parents, a few of whom may be on

board. "There's usually a couple mothers and fathers that have to take the same boat, for work," she says. "But the ones that have parents that come on with them — they're not too happy."

Four of the islands in Casco Bay have elementary schools, for children in kindergarten through fifth grade. When the children reach the sixth grade — a tender age for some — they head off-island for school. Chebeague Island kids go to schools in Cumberland, while students from Cliff, Peaks and Long head to Portland, to King Middle School, then Portland High.

Going off-island for school is common for Maine's island residents, but in Casco Bay the contrast between the island setting and big-city mainland schools is particularly stark. The children who make the crossing two times a day, five days a week, go from one-and two-room schoolhouses into the largest, most cosmopolitan city in the state, a place most of them have never visited without a parent.

"It's a major jump from the elementary sector to the middle school sector," says Miriam Remar, director of elementary and secondary education for the Portland Public Schools. The kids are at an age, 11 and 12, when they are also negotiating jumps from childhood to adolescence and from dependence on their parents and families to independence. Going to a new, larger school requires them to switch teachers and classrooms for every subject, adding to the difficulty. "There are always the transitional issues between elementary and middle schools, no matter where the elementary school is," says Remar.

But the issues are compounded for island children. When they make the transition to sixth grade, they go "up to Portland" from a small town where everybody knows everybody, to the noise, traffic and crowds of the city.

"Here they've had me for three years," says Paula Johnson, one of two teachers at the Long Island elementary school. On Cliff Island, which has a one-room schoolhouse, the students have one teacher for six years. Still, commuting to Portland serves as a bridge between island and city, and may help with the children's other transitions as well.

Children gain confidence and self-reliance as they learn to navigate streets, pay phones and public transportation. "In fifth grade, if I had the choice to come 'up' by myself I probably wouldn't have," says Tonya Mulkern, a seventh-grader from Peaks Island. "But now if I had the choice, I probably would, because I know the area better."

After sixth grade, most island kids make the trip on weekends and vacations with peers rather than parents.

On the MACHIGONNE, Aaron Schuit and Isaiah Oliver, both seventh-graders, climb the stairs to the second deck. "This is where our friends sit," explains Aaron, who is dark-haired and serious. "The kids who horse around hang out downstairs. Upstairs is quieter."

In Casco Bay the contrast between the island setting and big-city mainland schools is particularly stark.

He and Isaiah take the 7:15, except on days that they have morning basketball practice. Then they take the 6:15. A school bus meets them at the terminal, then brings them back for the 3:15 boat at the end of the day. If they have sports, clubs, or friends to visit after school, they walk to the terminal and take a later boat home. "We know the ferry schedule by heart," Aaron says.

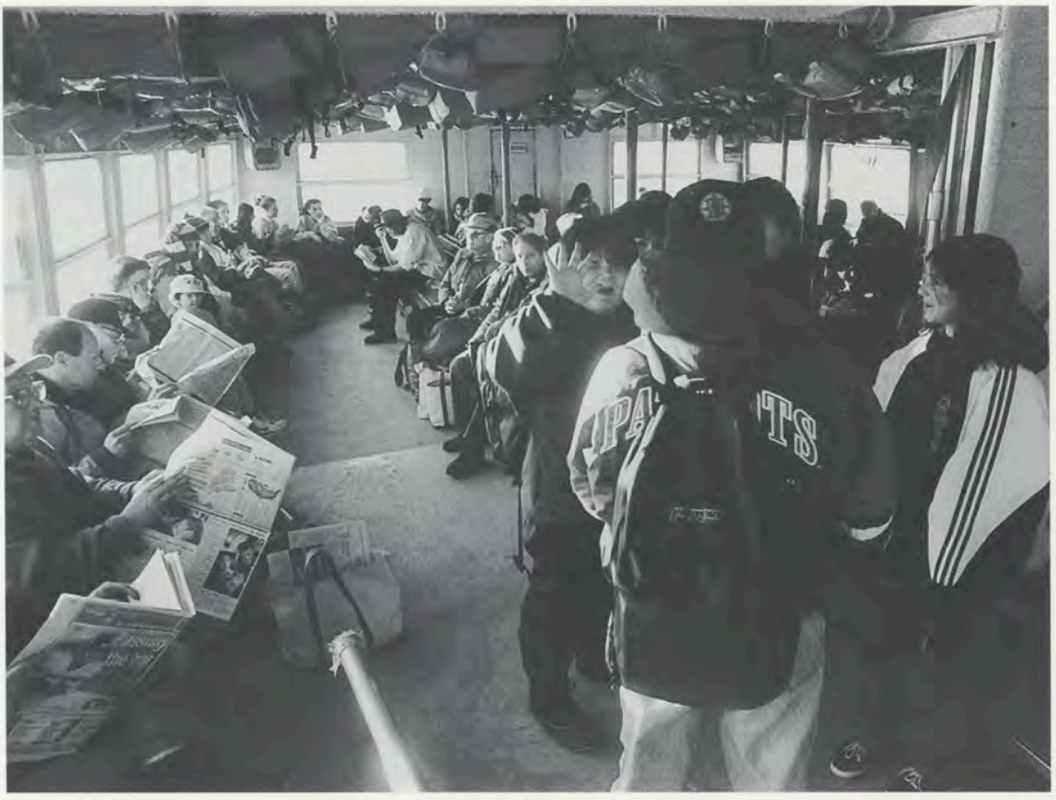
The worst part of the commute is having to get up so early. "I used to just roll out of bed and into school," says Aaron. While the logistics of commuting don't seem to bother these kids, getting them from the islands into King and Portland High is so complicated that hardly anyone seems to know exactly how it's done. Other than the children, the only ones who really know what's going on are the transporters — the bus drivers and boat crews who move them to and from the islands every day, making sure they get to school on time.

The boat pulls up to the terminal, and Isaiah and Aaron put on their packs and start down the stairs. Before going to King, Aaron had never gone into town by himself. Isaiah, taller, with sandy blond hair, used to do it "sometimes." But now they go up almost every weekend. Today the boys have a deliberate nonchalance, but one can imagine them as 11 year olds, smaller, more timid, making the initial crossing. "The first day all the kids from the island stuck together," says Aaron.

Did their parents go with them? "I would never let my parents come on with me," Isaiah scoffs. But when he and Aaron get in line on the lower deck, Isaiah scans the crowd. "Where's my mom?" he says, under his breath. "I gotta get some money."

The school kids shoot off the boat and into the parking lot, where several yellow buses are idling. "Bus 17 is the one that the middle school kids get on," explains Tonya. She grabs a window seat, and the bus takes off, winding through the brick and concrete of downtown. "I like the good parts of Portland — the Old Port and the malls," she says, looking out at people congregating on Cumberland Street. But she prefers living on the island. "There's no bad neighborhoods on Peaks," she explains.

The bus comes to a halt in front of the school, and the kids run off to find their in-town friends, who are tumbling out of other buses. Like Tonya, the other island kids enjoy parts of Portland, but would never, ever want to live in the city. One Portland girl, who likes to visit her friends on the island, says, "It's better out there."



Her island friend, in a green coat and purple earmuffs, says, "You can stay out later," and the Portland girl adds "It's not like Crime City." White specks of snow fall around them, and the kids get loud and energetic. But the bell rings and they run inside, taking all noise and color with them.

By 2:45 in the afternoon a veneer of snow, the first of the year, covers the city so it looks bright and, despite what the island kids say, pretty. At the terminal, children scramble off school buses and head for the benches on the dock or the variety store down the street. A couple dozen of them go straight onto the MAQUOIT, which is waiting to take them to Great Diamond, Long, Chebeague and, finally, Cliff, a whopping hour and 15 minutes away. The kids say "hi" to the deckhands and settle into their seats, the middle-schoolers under the stairs, the high-schoolers by the doorway. Less than a hundred people ride this boat, and they all know each other by sight, if not name. Less anonymous here, the kids seem more sedate than those who take the Peaks ferry. Then again, they may simply be tired.

"It's a long day," says Terra Parker, a freckle-faced sixth-grader from Long Island. "You get up at five and you don't get back till 7 if you have activities, and then you have to do your homework." But like the Peaks students, these kids are hardly fazed by the commute. Terra says, "The boat — it's really good — they have tables so we can do our homework." This year she played field hockey, along with her older sister, Billie, and her island friend, Moira Johnson. On practice days, the girls missed the bus and had to find another way to the boat. "We found a ride," says Terra matter-of-factly. "We didn't pay him. We gave him lobsters instead. He was our godmother's cousin."

While the Peaks ferry runs almost hourly from early morning to late at night, the boats to the outer islands are few and far between. Scheduling something as simple as a visit with in-town friends seems daunting. But Terra's eighth-grade sister, who has mellow red hair and a sophisticated manner, says, "It's not that hard." Several of her Portland friends like to come out to the island, Billie explains. "Because they've never really experienced being there, they're curious about it."

Terra's school friends are also curious. But when they ask her what it's like, she has a hard time answering. "It's Long Island," she says, shrugging her shoulders in exasperation as if to ask, "what more can I say?"

Though the children take the logistics of the commute in stride, the parents and teachers often do not. "When we plan a field trip," says King teacher Karen MacDonald, "the first thing we think is, 'What about the boat schedule?' We can't leave too early or too late, because of the boats."

On the day-to-day level, MacDonald says, "One of the things that can be difficult is doing extra-curricular activities. And that's a really important part of middle school." Long Island teacher and parent Paula Johnson points out that something as minor as a five-minute detention can throw off the whole delicate schedule of buses, boats and carpools. And unlike the Peaks kids, who'll wait no more than an hour for the next boat, "If the kids miss that boat at 2:45, they're stuck in Portland till 5:45. They wouldn't know what to do with themselves for three hours. And the parents wouldn't know why they didn't show up." To alleviate this problem, Johnson has arrangements with the King teachers to allow the kids to serve minor detentions at the island school.

"Missing the bus is the kids' biggest worry," Johnson says. A parents club used to give watches to the graduating fifth-grade class, until they started showing up with them on their own. Now, those with digital watches like to set them to beep at 2:25, when the school bus leaves for the terminal. If they miss it, they have to walk 35 minutes through downtown Portland, then wait for the late boat all by themselves.

Facing school in Portland, island kids worry about noise, crowds and the school cafeteria. Sitting in her classroom at the island school, Paula Johnson says, "That's what they're all afraid of. They don't know how they're going to get their food." She points to the room's ten desks, arranged in a cozy horseshoe. "Here, we all eat at our desks." Her daughter Moira, who's at King now, says the cafeteria "was strange at first. It's so loud, the kids all walk around."

On the boat, the girls elaborate on the differences between the island and city schools. "On the island, the biggest grade has five or six people," says Billie Parker. "Some grades only have one or two," and the school has 20 students total. "At King," her sister Terra says, "There are hundreds of kids just in your grade." Both girls say they were "wicked nervous" on the first day of sixth grade, and Terra, who has only been commuting for three months, can still remember her first bus ride through the streets of Portland. When she tried to visualize the return trip, she felt overwhelmed. "It looked like a 'wrong way' from school. I thought if I ever missed the bus, I'd never find my way."

They may get over their fears of the city, but none of them can imagine living there. "It looks more violent," says Moira, the schoolteacher's daughter. "Dirtier," adds Terra. "It's so much quieter on the island. You look out and you see the ocean instead of an apartment building." Even Peaks, which is just a Frisbee toss from Portland, is too close to the city. One of the middle school boys, Skyler Barden, leans over and says of Peaks, "It's just like the city." And the city, according to Skyler, is no place to live because of the "crime, gangs, the size of it."

The boat slows down at Great Diamond, where today there is a lone passenger getting off: a girl wrapped in red pants, blue windbreaker and pink mittens. "She's a third-grader," says Sam, another Long Islander. Diamond has no school, he explains, so she goes to Longfellow Elementary in Portland, though her older brother, who goes to King, is usually with her. She makes her way to the ramp, teetering a bit under the weight of her purple backpack and the roll of the boat. There's

no school bus driver here to make sure she gets off at the right place. What if she misses her stop? "She won't," says Skyler, who's sitting next to Sam. "It's a feeling." He unplugs the Walkman from his ears. "Dude, you can fall asleep on this thing. I can tell when it slows down; only at Cliff, though."

Two students come over from Cliff Island. "There's me and my older brother," Skyler says. Of all the student commuters, they are the first to leave in the morning (6:15) and the last to get home (4:00). It's no wonder that "Sky," who is 12-going-on-40, says all he does on the boat is "Sleep. That's all there is to do."

When the boat gets to Long Island, it empties out, leaving just a handful of people on board, Sky on one side, his high school brother on the other. Abandoned by his friends, Skyler reaches into his backpack and takes out a large plastic commuter cup, the kind grownups use for coffee, and it wouldn't be surprising if that's what he has in it, too. It's not clear whether he's going to spend the next half-hour doing homework or sleeping, until he gets the feeling that tells him the boat is slowing down and he is almost home.

"All of the children have had a variety of exposure to the city schools in one way or another," says Miriam Remar of the school department. "They come in to Longfellow School for their specials [music and art], so the children can become acquainted with a larger school." The Cliff Island school, which currently has four students, brings its students to town for art, music and physical education. On Long Island, which is no longer part of the Portland school district, the school does its own preparations.

"Transition is something we've worked on," says teacher and parent Paula Johnson. "And I think King is working on it, too." Johnson preps her students by taking them on lots of field trips into the city. "And when we're in there, we go for the day," she says. "That gets them used to being around other places." The island schools also arrange trips together, so the kids from Cliff, Peaks and Long all know each other before school starts. And Long Island recently received a grant to send all fifth-graders to the Chewonki Foundation in Wiscasset for a session of camping and outdoor education. That week, which is the longest many of them have spent away from home, "gives them courage and confidence," says Johnson, just before they go off to King.

"Even for some non-island kids, sixth grade is hard," she says. "But over the years I've seen King make an effort to ease the transition — not just for the island kids, but for all the middle school kids." Like most middle schools, King invites all fifth graders to a Step-Up Day in the spring before they enroll. The island kids spend the whole day there, learning the bus route, walking the school grounds, eating in the cafeteria. King is also experimenting with keeping sixth-graders with the same set of core teachers for two years in a row. This continuity is especially helpful for island children, who are accustomed to having the same teacher in the same classroom for years.

Still, says Johnson, "Transition is really hard. I'll hear from the parents in the summer about how frantic their kids are." King sends a school map to incoming students, and one of Johnson's recent fifth-graders spent the summer memorizing it.

"One thing that's made the transition easier is the crew of the boat," says Johnson. "They really look out for the kids." On Moira's first day, she was the only sixth-grader, and the school had to arrange special transportation for her.

Scheduling something as simple as a visit with in-town friends seems daunting.

When the bus didn't show up in Portland, the captain of the boat called the school and got someone down to pick her up.

Schools on small islands have low student-teacher ratios and a family-like atmosphere where no child goes unnoticed. These very differences may actually help the island children to do well in middle school. After the initial shock, they generally emerge confident and secure. "They're so used to participating," says Johnson, "because there's no way to hide when there's only ten. There's no way to fade into the background here. They know they're going to be part of the conversation so they might as well pay attention." Teachers at King have told her that, despite their shyness, the island kids raise their hands at a surprising rate. Last month, two of her former students, Billie and Terra, were both Students of the Month. "And the month before that I had another one," says Johnson. "Obviously we're doing pretty well."

According to the teachers and administrators at King, island kids are like any other kids, except they get up earlier in the day. "I really feel sorry about these kids who have to get up at five in the morning," says assistant principal Dudley Coyne. "These kids must be tired." Coyne, who is in charge of discipline at the school, says that the similarities between islanders and mainlanders far outweigh the differences. "Any middle school kid, whether island or not, when left alone, could raise Cain. We've had some roughhousing at the terminal, but it's never been something that's unsolvable." Karen MacDonald, who teaches sixth grade at King, has a more intimate relationship with the student commuters. But even she says that it's tough to tell them from the Portland kids. "They fit in nicely," she says. "You don't always know which ones are from the islands. They leave five minutes early, to catch the bus — that's how you know."

Like Remar of the school department, assistant principal Coyne explains that all sixth-graders are anxious about going to middle school. And though the "down the bay" students and their parents are especially apprehensive, he says, "It seems to go away in the first couple days of school. It's amazing how they get over it."

According to MacDonald, it's not quite that easy. "Some kids come in and they adjust right into it," she says. "Other kids, it might take all fall." But she is quick to point out that this is true for all new students. "The advantage is that everybody's nervous coming here — not just the island kids. They're making the transition along with everyone else." And though the size, isolation and familiarity of the island elementary schools contrast with the atmosphere at the city schools, MacDonald points out that King gets students from alternative schools and other backgrounds that can also be seen as islands of a sort. "They're all nervous," she says. "But they all make new friends, and they all survive."

At the dock, Billie and Terra get a ride from their dad, while Sam, Moira and Darlene, a freshman at Portland High, walk up the street, waving at cars, yelling out to pedestrians. When she first started going, Moira says, Portland seemed "scary and strange." But now she's "sort of glad to be going off-island for school. It's a change. You feel older, and you get to meet different people. And you get used to going to town by yourself."

Darlene and Sam, who live across the street from each other, head for home, and Moira continues up the road. She describes her first visit to King: "They took us up and walked us around the school. We walked the bus route in case we ever missed the bus. Then they let us go." That's all she says, but her voice, disappearing into the late afternoon air, seems to say more.

Later, in the two-room schoolhouse where Moira spent much of her childhood, her mother talks about the first day. "There's usually a contingent of parents down there at the dock, taking pictures. But Moira was the only one in her grade last year." She pauses. "That's horrible, when you're the only one." Then she laughs. "We had Moira's older brother on the float in case she needed him to go over with her. But she went on by herself."

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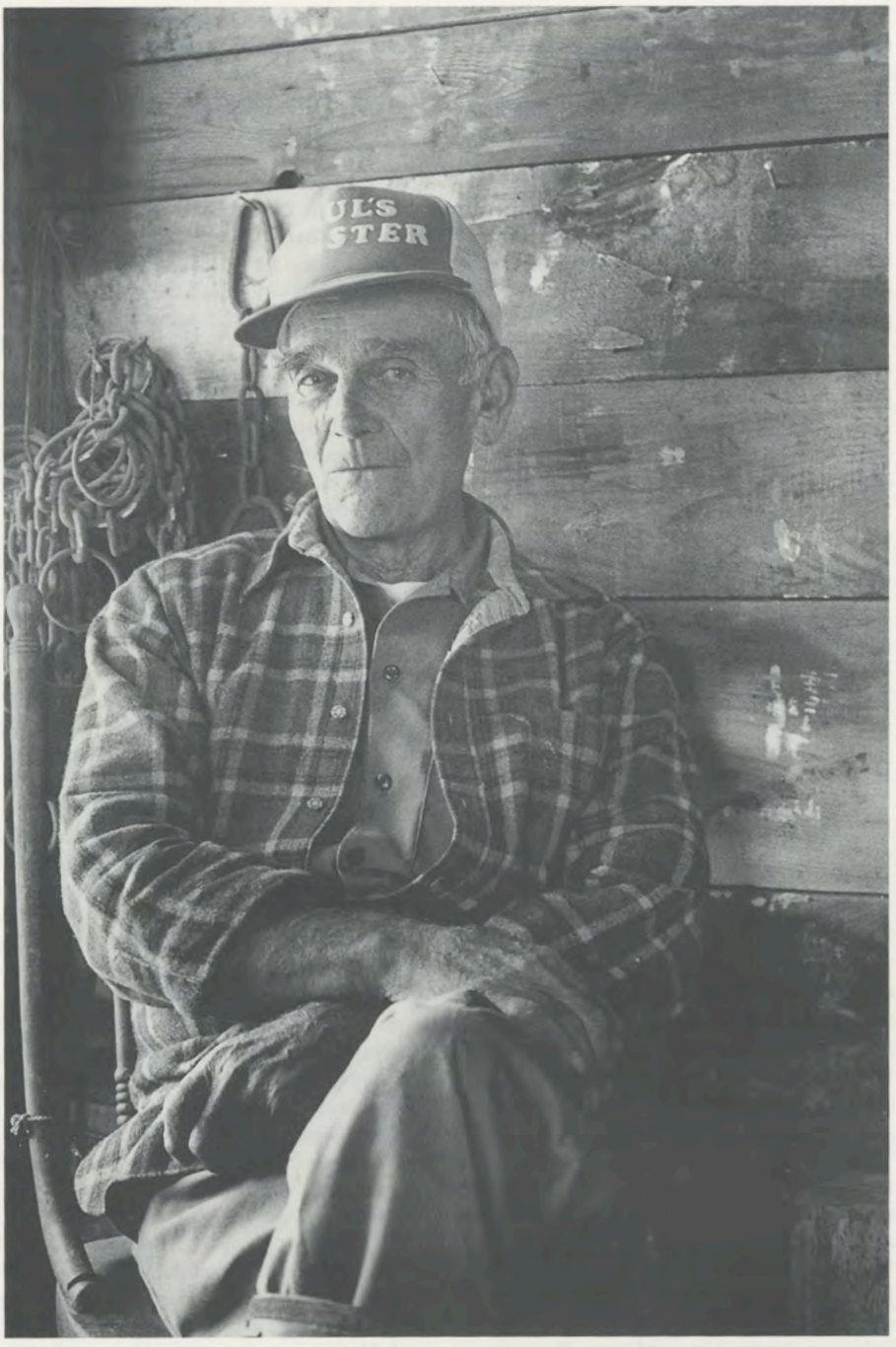


GETTI

KAREN ROBERTS JACKSON

Photography by Rachel Boyden Noyce

Nearly a year ago, someone recommended to me that I do a story on Clarence Bennett. As I considered the idea of finding out who Clarence Bennett is and why he would make a good story, our informant and mutual friend, Mr. Brud Carver, proceeded to tell me. He fed me a handful of quick tales: how during wartime Clarence had taken homing pigeons aboard his boat as he watched for enemy submarines; how he was still going out to haul at the age of 83, how he had spent a part of his teenage years living in the lighthouse keeper's house on Heron Neck, Green's Island. That was enough for me; I was baited and hooked. The gentleman sounded mighty intriguing. The island connection was particularly compelling; my family and I live on Green's Island and much of the history we dig up about the island and her lighthouse is often piecemeal or embellished upon. Here was a rare opportunity to tap a living source.

It took me quite a while to get my nerve up to approach Mr. Bennett for an interview. When I did it was in the checkout line of the local grocery store and his response was, "If it comes right." Finally, on a nasty, rainy, cold, January day , it "came right." In his modest manner of storytelling, he taught me a lot more about life's variety than about life in a lighthouse.

WHEN I ARRIVED AT Clarence's home, he wasn't in. I was afraid he might be dodging me, had changed his mind about doing the interview. His daughter-in-law, Carolyn, assured me that he was only adhering to his schedule — in the mornings, Clarence drives down to the waterfront, then goes to his fish house to visit with some of the other old-timers keeping watch shoreside. Sometime after lunch, or early evening, Clarence heads back to the fish house for a few rounds of cribbage. A pretty mellow, well-deserved way of life. Clarence Bartlett is, after all, 84 years old.

Just last year, Clarence sold his boat, the DOROTHY M. II, and retired from lobstering. He likes to tell you that he never worked a day in his life — that is, he never worked a day for another man. "I just wasn't cut out for it," he says. He never quarried, farmed, worked in the woods, did caretaking. For nearly 65 years, he earned his living on the water. By "living" I mean subsistence, barely enough to get by, just enough to raise a family on.

Explains Clarence, "In those days there wasn't any money to be made. As far as earnings, it was the quarrymen, the fishermen and the lobstermen, lobstermen

being the low man on the totem pole. Scrod went for a penny a pound, market cod sold for two cents a pound, large cod (for salting) went for three cents. Lobsters weren't considered much good for anything, except maybe canning."

"Getting by" was something at which Clarence was good, something that had been bred into him from early childhood. With one younger brother and one younger sister, Clarence grew up in Southwest Harbor. His father worked for the Lighthouse Service (precursor to the Coast Guard), manning lighthouses. For most of Clarence's boyhood, his father was stationed at the light on Saddleback Ledge in Penobscot Bay, roughly four or five miles southeast of Vinalhaven. The rock itself was so inhospitable and so difficult to land on that it was manned by two or three men on a rotating basis. Clarence's father worked three weeks straight, then had a week off to spend with his family.

Clarence recalls, "In the winter my father would row in from Saddleback to Roberts Harbor, walk into town, catch the ferry to Rockland, take a train to Brunswick, take another train to Ellsworth, then a cab to Southwest Harbor. It took him about a day to come home and a day to get back. This was for $35 a week pay. He was lucky to have a job — most men were earning $20 a week. There was not much work."

After high school, Clarence enrolled at the University of Maine to study engineering. He did not get very far. It was 1930; the Depression was on; there was no money for school; there were no jobs for young men. Luckily, his father was soon thereafter transferred to the lighthouse on Heron Neck, where he could move his family into the keeper's house. He was stationed on Heron Neck for the next 18 years. Clarence did the only thing that made any sense: he took to fishing.

His recollections of that time in his life seem to speak of much contentment. "It was a beautiful house to live in; you couldn't ask for a nicer house or a better view. We didn't crawl around the island too much except maybe to go hunting. My father kept a few chickens and we had a small garden, mostly flowers really. My parents went to town [Vinalhaven] nearly every day, every other day, for milk and supplies and such. My mother would bring women out and have bridge parties into the evening, then my father would take them back into town.

"I remember there used to be a bell tower out there along with the light. It had to be rewound every three hours like a grandfather clock. It had a huge crank on it that was equal to cranking 1,500 pounds. I think my father slept with one eye open; he never missed cranking that bell. They finally tore the bell tower down and pushed the whole thing, with that 600 or 700-pound bell, right off the cliff into the ocean. It's still there, I imagine."

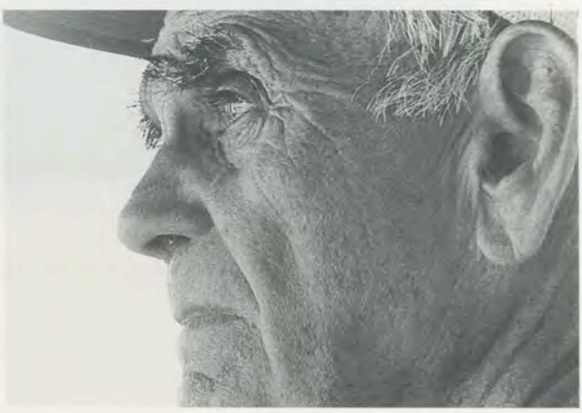
"I can remember, my brother's and my bedroom faced Hurricane Sound. One night there was such a gale blowing, a wave hit the house and blew out our bedroom window. My brother jumped out of bed so quick, he was out of the bed before the glass hit his mattress.

"Another time, a 60-foot fishing schooner, the FANNY BELL, went on the rocks at Heron Neck Ledge and the crew left her. My brother and I could see her lights still on. My father didn't want to go out there, but my brother and I did. We took our 26-foot power boat and went out. It was blowing a half a gale of wind. We got to her just as her decks were awash, got a line on her and towed her into Deep Cove and beached her. The company that owned her came a few days later and tried to just tow her off, without saying anything. I went to town and got the sheriff, he came out and made them stop. They had to pay me a finder's fee; they ended up paying me $500."

"When the weather was good, my brother, Phillip, used to walk across the island to Bratty Bray's house, row into town and walk up to school. I remember one night he got home a little late and had to walk across the island in the dark, got himself mixed up a bit. No, he didn't have no flashlight, kids didn't own such a thing as a flashlight in those days.

"The Coasties would bring out oil for the lamps that we would carry up to the house in five-gallon cans. In the house we burned 12 tons of coal a year. They would dump it on the beach and we would have to haul it up that slope to the house. All our water was rain water we caught off the roof and filled the cisterns in the basement."

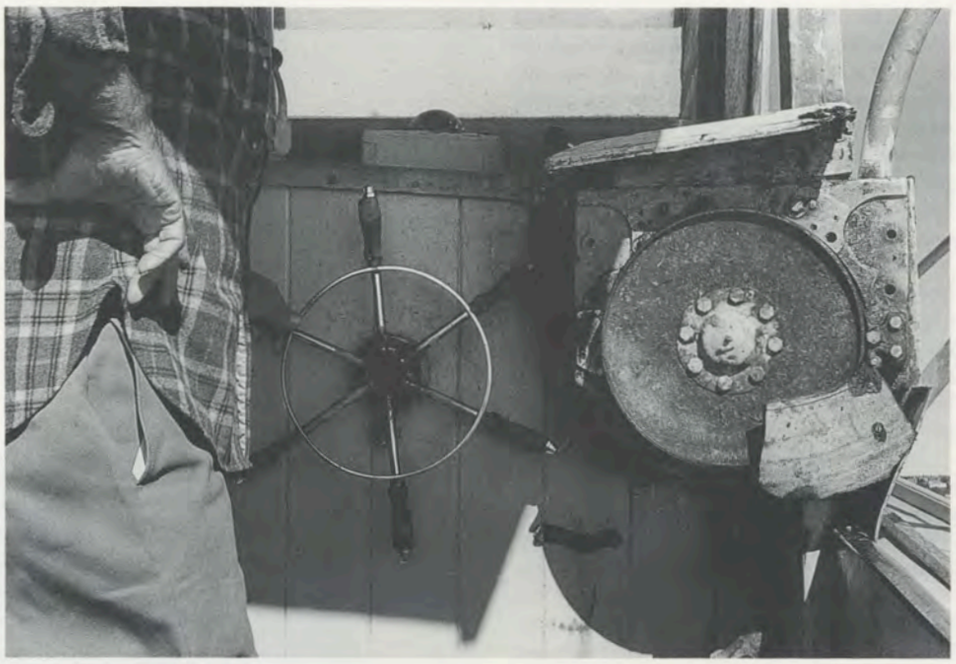
At the age of 20, Clarence began his "schedule": up long before the break of day, heading out to net his bait of haddock and mackerel, fishing long into the night. "Fish were plentiful then," he says. When he had a load for market he would take his catch into Rockland to be sold. "Then all you had was a compass to go by, you could sail around in the fog for a day or two, not really be sure where you'd come in," he remembers.



NG BY

"People just don't know how hard times can be . . ."

– CLARENCE BENNETT



At 22, he met and soon married a local girl, Dorothy Cobb. They had two children, Bob and Ruth Ann, and settled into a life on Vinalhaven. In 1938, he had a new 33-foot boat built by local boatbuilder Forest Macan for a price of $2,200.

Says Clarence, "He worked all winter on the electrical system and the rigging. In the spring I asked him what I owed him and he hadn't written down his time or materials. 'A hundred dollars will do it,' he said."

For 10 or 12 years he continued fishing, dragging for redfish and supplying bait for other fishermen. When World War II started, Clarence was all signed up to enlist, but town fathers told him he should stay home. "I was still bringing in the fish. They told me they needed me to stay right here," he says.

Clarence did make a contribution to the war effort with his training of homing pigeons. Aboard his boat he would carry a half a dozen to a dozen young pigeons that had been raised by the Navy. They were to return to a base in Rockland. If Clarence noticed any suspicious vessels while out fishing, he was to set them flying.

"We often picked up wreckage out there in the water," says Clarence. "Aviators' hats, bits of sunken boats — there were freighters sunk in the same vicinity as where we were working."

After the war, lobsters were selling for six cents a pound. By 1950, they were bringing 13 cents a pound. Clarence and his brother decided to try their hand at being lobster buyers, buying up and delivering local lobsters to the dealers in Rockland. Their "profit" at the time was roughly three cents a pound.

"As a buyer you had to furnish bait to your men, you had to get it anywhere's you could," Clarence recalls. "It wasn't like now where the seiners bring in your bait. I remember one trip when we had 125,000 pounds of lobsters that we bought at 25 cents a pound. When we got to Rockland, they were paying three cents less, and we ate it, we paid our guys their 25 cents. We made about a hundred trips a year into Rockland, sometimes three in one day. Sometimes we went when we shouldn't have, sometimes into 50-mile-an-hour winds. There was only one ferry a day then and people coming to Vinalhaven had to get there any way they could, so I often gave rides. We came home in the dark. In those days the buoys didn't have lights, and we'd come home in the pitch black.

"Things were very different then. An ordinary man fished 100 traps, and he was hard workin'. Now if a man doesn't fish 500 he's a piker [a fool]; even the kids do 400 or 500 traps. They even think differently now — a man used to haul all his traps every day, now they check them once a week. In those days you made your own traps, netted them, knitted your own heads and bait bags. Some of us even went over to Hurricane Island to rip the plaster laths out of the buildings there to use for making traps. "

By the 1970s the lobster industry was beginning to prosper on Vinalhaven. Prices were rising, bigger boats were in the harbor, the Fisherman's Co-op was started. Clarence soon got himself a bigger boat and went back to lobstering. He was usually out by 3 a.m., breaking the ice out of the harbor, breaking out the other lobstermen.

When I fully realized what Clarence's schedule as a working man had been, I couldn't help but think of his wife, and of his mother, essentially raising the children alone for long periods of time, worrying about whether their men would make it home on rough or foggy nights. I asked how they did it, raising kids, making ends meet. "They were always good for it," Clarence replied.

"People don't realize just how hard times can be. The way I remember it, after expenses and all told, my parents lived on two dollars a week for food. People just helped one another out, and it all worked out somehow. Back then, Vinalhaven was a lot bigger than it is now; there were about 3,000 people living here. The best thing about Vinalhaven was that everyone treated everyone just the same. It didn't matter if you're really poor or rich as a king, they treated you the same. I remember when a movie was made on Vinalhaven, all of the actresses went out to the lighthouse to play bridge with my mother, all of the fellows went and drank a few with the men in the fishhouses. They said when they got back to Rockland people were climbing all over them wanting their autographs and such. That didn't happen on Vinalhaven. It is a different world altogether now. Things will never be the same."

Karen Roberts Jackson *lives and writes on Greens Island, near Vinalhaven.*

Courtesy of Edgar M. Boyd (6)

SURRENDERING CONTROL

Three decades on an island teaches you a lot about yourself

EDGAR M. BOYD

THIS YEAR IT will be 32 years since my wife and I bought White Island and built a summer home on it. We and our three children have spent at least a portion of every summer there since.

White Island was wild and forbidding when we came, burnt over from a fire lit to clear the slash after a wood cutting operation in the fifties, and still practically treeless. Neither road nor electricity connected it to the mainland. The island lies about a mile offshore, at the eastern entrance to Eggemoggin Reach. It is almost as wild today. In 30 years we really haven't changed a thing.

Problems that came up in the course of establishing a home on the island required seat-of-the-pants and sometimes unorthodox solutions. Living there seemed to require an awful lot of energy — lugging, cutting, trail blazing, building, getting machinery to run, facing breakdowns and getting discouraged. Success depended mostly on persistence and facing problems

with a common-sense approach. "Getting someone out here to fix it" was as impractical a solution 30 years ago as it is today.

At first we tried to do too much, and the island in turn became more and more demanding. A struggle ensued between our desire to control the island and the island's inclination to run wild; a struggle must play out whenever and wherever men and women come head to head with the wilderness or frontier. The result for us was several years of real difficulty manag-

ing the land; it was even hard to enjoy the time we got to spend there. We experienced cycles of frustration, achievement and happiness that are easier to understand and appreciate looking back on them.

I should explain that my wife and I did not elect to become the sole inhabitants of an 80-acre offshore island as a result of some quirky, romantic, escapist, or utopian plan. We were neither refugees from the city, flower children, nor smoldering malcontents. We fell into island ownership for what seemed like practical and hard-headed reasons.

Thirty-two years ago there was very little coastal land for sale. Of what there was available, island property was far and away the least expensive. Who in their right mind would want to live out there, people wondered. We bought the island anyway, "the single most irresponsible act you had committed to that time," my father later noted dryly. "Yes, but" — our reply was that the raw beauty and absolute uniqueness of the place proved impossible to turn away from.

Captain George Jennings, a realtor with Aqua-Terra Enterprises in Camden, listed White Island and several other islands along with a selection of some mainland properties. Small, uninhabited islands, George said, were cheap and plentiful and hard to sell to the public. Until quite recently, he explained, some islands had been available from the government for "practically nothing." To this day I don't know exactly what George meant by that. The lore had it that sometime after the war ended the government was selling islands for as little as a dollar.

It gives you some idea of the going prices for islands in the mid-sixties to note that Bradbury Island in eastern Penobscot Bay, over 200 acres, high and very majestic-looking, was then on the market for about $50,000. White Island, about 80 acres and not nearly so high nor commanding a presence, was less than half as much. In fact, the cost of it was the same as a quarter-acre lot we had looked at on Cape Cod a few weeks earlier.

For the most part, the islands George Jennings listed were well under 100 acres. They had been passed down through Maine families to a generation who now had no particular use for them, and who saw no particular value in them, either. Typically, few of the islands had any sort of structure on them, which is generally still true today. Some were used by their owners for grazing and raising sheep. Others were occasionally cut for the pulp wood. Still others served as outposts for fishermen who might have built small shacks for storing traps and bait, for servicing their boats and very infrequently for spending the night. In the prevailing scheme of things, there was no reason why anyone would actually want to live on one of those islands.

Yet coastal Mainers cared deeply about them, essentially wanting the islands left alone. Above all, the people who lived near them feared some outsider coming along, lining the shore with "No Trespassing" signs and putting up buildings more fit for the city. And here we were, one of us from New York, the other from Boston: the Ultimate Outsiders. Yet everyone with whom we spoke about buying the island was open and courteous and offered us their help. People were obviously relieved that we had plans to build a house, plant trees, raise children and otherwise leave things pretty much as is.

My wife and I had other, more immediate concerns. We had no access from the mainland, no boat to make the passage, and we had no knowledge ("savvy") of the coast and the basic difficulties of going to and from the mainland. I knew practically nothing about boats, my wife knew little more. We had no power on the island. Where would we ever find someone willing to build a house out there using no power tools? We wondered where and how to begin.

In the October of our first visit, still-blackened tree trunks left over from the fire in the fifties dotted the landscape everywhere. There was some young growth of ferns and struggling grasses, but now they were brown and matted from the cold. Only a few groves of live trees stood, separated widely from each other. The October bleakness on the island was beautiful in its way, but I remember thinking that so much had to be done. The following May when we returned as the island's new owners it still looked brown and bleak, but part of that bleakness now included the bones of sheep who had never been shorn and whose wool had frozen them to the ground where they lay for the winter. Surely, we thought, we could make things better on this island!

At the western end we found the biggest clump of live trees and the nicest view facing the sunset with the Camden hills some 25 miles distant. Local fishermen and carpenters who had agreed to build our house made the first path there with a patchwork "truck" they had assembled and brought up their tools. The lumber was brought over on a truck on a landing barge. What we learned from the building experience was that there was almost nothing that couldn't be done on the island if we and these talented and versatile workers put our heads together about it.

I remember to this day looking westward out the front door of the house the first night we spent in it and seeing only two lights off in the distance. It was the wilderness, almost.

THE AGE OF INNOCENCE

As we began our first years on the island, it was clear there were some things we were doing right, mainly, keeping it simple. We had no electricity or telephone and delighted in that fact. The lights, water heater, stove and refrigerator ran on propane. Back in those days when the power was lost on Deer Isle (as it was frequently) in electric storms or high winds, we on the island felt smugly secure and invincible knowing we had full propane tanks out back. Not having electricity or a telephone caused us no major problems.

It seemed a logical and easy next step to keep access to all parts of the island open so we could plant trees and clear the brush. We got a small dozer over to cut a narrow road around the island's perimeter, and brought up a $600 rattletrap jeep from Maryland to put out there year-round.

The plan was a bad one. The jeep was never successful. The axle hung too low and fetched up on rocks, and there was always plenty to do working on the house rather than worrying about clearing at the other end of the island. That first year taught me the necessity of winterizing machinery, too. It took me more than a week to get the jeep going the following summer.

The jeep lasted two seasons before we sold it. Fireweed began growing in the road, which was never really worthwhile anyway. We had planted a dozen apple trees down the center of the island, but after a few years they seemed remote and seldom got our attention. We started concentrating our efforts at the western end where the house was.

In those first few years we experienced the joy of living a simple life on a sort of island "frontier." We allowed the rhythms of the tides and the hours of daylight determine our schedule as much as the clock did back where we lived and worked the rest of the year. We felt a kinship with other island settlers and mainland people who had also chosen a simple coastal life. All of us lived in small, unassuming homes that reflected our greater interest in the place we had been so fortunate to find. We often shared lessons we had learned about the land and the water, about boats and navigation, or about the shell heaps we had nearby. The world around us was our focus. This was no mere vacation land, but a very special place.

Middle Age Discontent

It was impossible to give up the feeling that the destiny of the island was ours to control. We continued to believe that we could mold things here and change things there to suit our needs and our image of the way things ought to be. Without the jeep, we needed some other means to pull propane tanks and heavy supplies up the path and to keep trails open. The trees we had planted and the natural reforestation were taking hold fast. It was getting crowded on the island, and that bothered me a great deal.

There was lots to be carried now that our second child was born and then our third. High chairs, play pens, baby formula and cases of baby food needed hauling, and it was a good hundred yards from the dock to the door. We took a small, used Gravely tractor to the island one summer. But it, too, was a struggle to keep going. I got awfully mad at that tractor, and frustrated with my need to depend on it. The only gasoline engine I had luck with was the three-horsepower Briggs & Stratton water pump. It started for 30 consecutive years and lasted until it was replaced by an electric motor just two years ago. Machinery did not tend to live well on the island, which was, after all, a marine and very hostile environment.

We got used to taking extra "things" out to the island, things that eventually included an excess of clothing, a radio, a small television set and other 12-volt electrical devices. Arriving at and leaving the island at the beginning and end of the summer became too much of a production, and were occasions we ended up dreading.

For some reason when we create a home for ourselves we tend to want to overplan, to foresee any eventuality and to have everything we ever might need. We thought about a place to have a picnic overlooking the Reach, a way to trim the grass, a shed for keeping a boat, a chainsaw for cutting trees and firewood, a guest house, a cable to the mainland for electricity and then perhaps one for a telephone. When the opportunity presented, we got a lot of that "stuff" out there little by little. We never got everything, but we got way too much, nonetheless.

A struggle ensued between our desire to control the island and the island's inclination to run wild

Raising small children was difficult on the island; they had to be watched constantly. It was hard to separate concern for them and pleasure with them. They were too young to help us, but required an endless supply of provisions and distractions to be brought over. Again, too many "things." "Things" had taken over our lives. The era of young children magnified that fact.

We had machinery that required maintenance and winterization, plumbing that needed to be drained before we left, boats that needed to be hauled and floats that needed to be pulled. We did most of this ourselves, and by the end of our second decade on the island it had all become too much. I asked a few friends about their own experiences along the coast, wondering if they had any answers. For several summers I talked about selling the island. Life would certainly have been easier for us on the mainland, wouldn't it?

Some Enlightenment

The secret, of course, is to build, use and maintain only what you need. It may be a characteristic of youth to bite off more than you can chew, but luck and experience sometimes help you down-size to what is manageable and makes sense. Sometimes.

In fact, it was our kids' growing older that helped reverse the trend. They carried, they built, they took care of themselves, they became clearly satisfied with island life in all its elemental simplicity. Perhaps as kids they had absorbed our mistakes and dissatisfactions unwittingly, and so required little more of island life for themselves than simply being there. My wife and I have been going in that direction for several years now. The island is so unique. It is simply being there that matters.

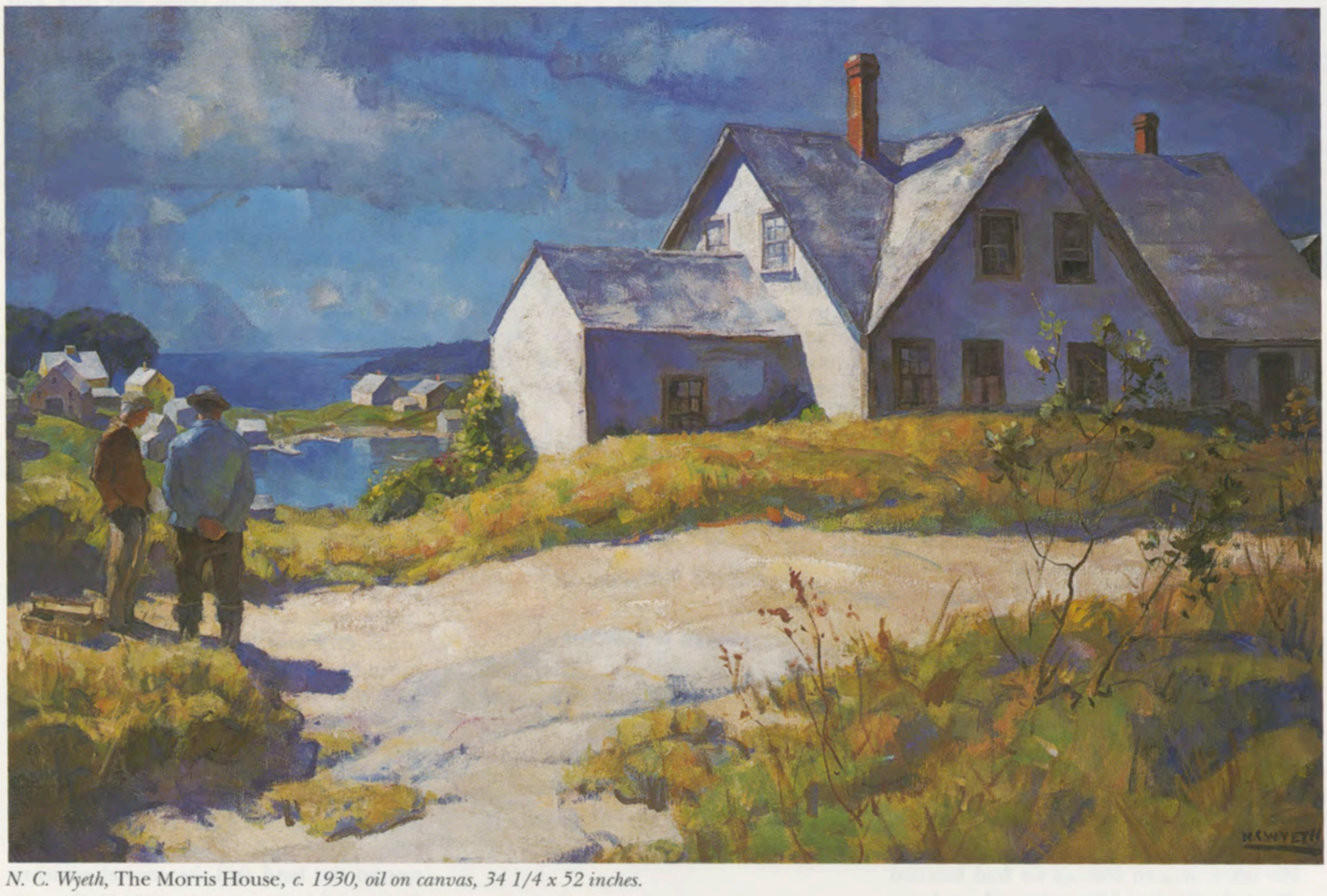
Within the last ten years the new forest has begun to close off the remaining open spaces. It is a dire situation. It would be a shame to lose the openness, for that would change the character of the island completely. We are not there long enough to be able to do effective cutting. We maintain a path to our friends' house at the other end and keep open a few of the more important areas, but that is all we have time to do. We are not there in the summertime just to cut trees, and so the trees are getting ahead of us. Sad but inevitable.

It is sad also to see the many large houses being built along the Reach. They represent a completely different attitude toward the land and the coastal environment, and seem inappropriate to the surroundings. This often happens, it seems, when the value of coastal properties rises.

Despite these trends, my family and I are now left with a growing sense of enjoyment of White Island. How gratifying it is to arrive at this point, recognizing that simpler is better, after having lost the whole point of island living for some time. There is much work to be done on the island, but these work projects have become steady, useful ones for us, instead of frenetic, exhausting ones. In most cases, it simply does not matter whether they get done today or tomorrow or even this year. If we are eventually confined to one-tenth of the island because of tree growth, then so be it. That is probably all we ever needed.

The island is almost as wild today as it was 32 years ago, but certainly not as forbidding. Nor has the neighborhood changed all that much. Last summer I looked out the front door late one clear night. All I could see were four lights.

Retired from teaching and the book business, ***Edgar M. Boyd*** *writes and messes about in boats.*



N. C. Wyeth, The Morris House, *c. 1930, oil on canvas, 34 1/4 x 52 inches.*

The Art of Community

CHRISTOPHER CROSMAN

A sense of community in Maine and the role of work in those Maine communities are central themes in Betty Noyce's magnificent collection of art, which she bequeathed in part to the Farnsworth Museum, and in part to the Portland Museum of Art. The Farnsworth's major summer exhibition for 1997, entitled "Maine at Work," draws heavily from the Noyce collection, including several of the paintings and watercolors illustrated here.

BETTY NOYCE understood that in Maine, work and community are nearly synonymous. In coastal communities, ways of working, the built environment and leisure activities are always close to the sea that, at one time, both isolated and connected them.

Maine communities have changed dramatically. Many island communities have disappeared altogether. What endures is the sense of community, shared values that allow for independence and distance from both neighbors and the world at large.

Artists have long been drawn here by the qualities of sharing and independence. Beginning before the Civil War with Fitz Hugh Lane and Frederic Edwin Church, and later with Winslow Homer and Eastman Johnson, painters have focused on the day-to-day lives of Maine people. In the Luminist paintings of Lane, the stillness and calm of Maine waters are nevertheless populated with working schooners, fishing boats, lighthouses and distant small towns, all signifying a harmonious and close relationship between men and women and nature. Later on, nature and especially the sea become a powerful, cautionary tale of the precarious hold people have on coastal Maine houses shrouded in dense fog, lonely wives of fishermen desperately searching the vast emptiness of the ocean for their loved ones, or crowds of helpless and awestruck bystanders watching a ship founder in a storm or on a not too distant reef. Community is in the shared drama and terrible beauty of the sea.

Many of these themes and images are carried by artists well into the twentieth century. In the first decades of the new century, George Bellows was among a small group of artists led by Robert Henri (who first brought Bellows to Maine) who were labeled by critics as the Ash Can School for their depictions of the alleyways, tenement roofs and day-to-day pursuits of ordinary men and women living in large cities. Bellows and his contemporaries were not social critics. Their work celebrates the generally high spirits of America at the dawn of the new century. Bellows's paintings of Maine depicted such local subjects as shipbuilding in Camden and life on Monhegan and Matinicus islands. Although hardly urban in setting, these works almost always feature working people. His *The Teamster*, 1916, depicts a young workman, as thick-boned as both his team of horses and the framing of the ship looming in the background. Behind the boy, whose back is turned, two carpenters provide a foil for the strength of youth against the skill of experience, both necessary for the creation of the great ship under construction. In Bellows's direct, uncomplicated composition the artist traces the entire process of shipbuilding from sawmill (the freshly cut stump at the lower left connoting the absent lumber mill worker), to transport by the teamster, to fabrication by the master carpenters. All are essential. Together they are a community of diversity and independent worth. The

heavy paint, brilliant color and movement-laden paint application, especially in the scudding clouds of the sky, reinforce a sense of activity, interaction and natural harmony.

Bellows's *Matinicus*, 1916, is less overtly didactic, although the theme is largely the same. In this smaller painting the lobster traps function as a kind of arrow, leading the eye up and into the painting from the lower foreground. The boat is a working fishing vessel and not a pleasure yacht as might be seen on other offshore island enclaves, even in 1916. The sails are tightly reefed and the boat rides high in the water, probably having unloaded its catch. Matinicus Island epitomizes the small, close-knit communities that have survived for generations, far removed from the comforts and amenities of the mainland. Again, Bellows emphasizes the lonely though essentially communal nature of working in Maine. The ragged shoreline and ramshackle buildings add to a sense of working and living at the edges of human existence, where the respite of a moored fishing boat is a rather rare sight. Pointing straight up and into the sky like a New England church spire, the mast comes to symbolize an almost religious connection of land, sea and man — who is integral and natural to this environment, no more or less important than any of Bellows's vigorous brush strokes that give the painting unity and vibrant, upsurging energy.

The daughter of a prominent Washington, D.C., family, Eleanor Parke Custis was a world traveler and highly prolific artist who was also widely recognized for her photography. Between 1923 and 1926 she traveled to Europe three times and during the summers of 1924 and 1925 she spent summers in Maine at Boothbay Harbor, where *Damariscove Island*, dated 1924, was probably painted. This charming gouache painting of houses and outbuildings nestled into the small island reflects a sensibility informed by the lessons of early European modernism. In its thick outlines and patterning with irregular blocks of pure color, the painting also suggests her interest and work as a book illustrator emphasizing heavy outlining and wood-block printing techniques. Unlike Bellows, who focused on the heroic qualities of Maine life, Custis's painting evokes a kind of ease and joyful tranquillity that is measured and precise in its economy of means.

Communal work is the theme of two paintings by husband and wife William and Emily Muir, longtime residents of Deer Isle. Emily Muir continues to live and work as an artist in a house she designed and built herself (although she has no formal training as an architect, she has designed numerous critically acclaimed homes in Maine). While somewhat similar in style to her late husband's, her paintings tend to be more subdued in palette, subtle in modeling and contemplative in mood. In *Women's Work*, she depicts a world of domestic chores and family life. The dignity and worth of work performed in the home by women and men is only now being recognized for its social and economic importance. In a darkened

George Bellows, The Teamster, *1916, oil on canvas, 34 1/2 x 44 inches.*

George Bellows, Matinicus, *1916, oil on panel, 18 x 22 inches.*

Emily Muir, Women's Work, *1933, watercolor on paper, 13 7/16 x 19 7/16 inches.*

Eleanor Parke Custis, Damariscove Houses, *1924, gouache on paper, 14 x 16 inches.*

William Muir, Fish Packing Plant, *1945, watercolor on paper, 14 5/8 x 19 5/8 inches.*

interior flooded by light that dissolves edges and forms, the women, one with back to us and the other facing outward, literally faceless, suggest the anonymity of house work and their hidden, under-recognized contributions to family and community. Dated 1933, Muir's painting seems remarkably prescient and timeless.

Women who by national necessity found a place alongside men in factories during World War II, sometimes remained at the job after the war, as we see in Bill Muir's 1945 painting, *Fish Packing Plant.* Bill Muir is remembered today primarily for his semi-abstract sculptures but, like many sculptors, he had a facility for drawing and watercolor. Looser and somehow more free than his compact and highly finished sculptures, this painting of fish-packing has a monumental quality recalling early Italian Renaissance altarpiece paintings. It is hard not to see Muir paying homage to Leonardo da Vinci's Last Supper — or is it "behind the scenes at the Last Supper"? Muir was certainly capable of such gentle irony and humor. Like Bellows, Muir acknowledges and celebrates the nobility of working people. Each figure is individualized with his own unique body language, and we have the sense we might recognize any of these people at the local general store. Their separation at the table suggests separate inner lives and personal stories that contrast with the numbing repetition of their working existence.

One of Betty Noyce's last acquisitions, the painting entitled *The Morris House,* by N.C. Wyeth, was among her favorites. It depicts the house set on a rise above Port Clyde with two figures identified by Andrew Wyeth as Ralph Benner and Walt Teel. Teel and Benner are turned toward the harbor and ocean where they might see Teel's and Benner islands, named for their forebears, who were among the earliest settlers of the region. The continuity of generations, the solidity of the house, hunkered down like a ship in a safe harbor, the close relationship and strength of friendship, the dramatic and uplifting panorama of the Maine coast, are all captured by Wyeth and are undoubtedly qualities that had great appeal and resonance for Betty Noyce.

Her art collection is remarkable, not only for its high quality and exclusive focus on many of Maine's greatest artists, but for what it says about the passion and intelligence of the collector. It is telling that in addition to masterworks by Fitz Hugh Lane, Winslow Homer, George Bellows and the Wyeth family, to name only a few, she collected and treasured works by lesser-known but important artists such as Emily and Bill Muir and Emily Parke Custis, as well as many younger artists living and working today in Maine. Together they give her collection and Maine art its richness and texture. Like the works of art she collected, Betty Noyce was rare and radiant, a masterwork of the human spirit who will long be remembered. Like the painters of these works, she recognized and loved Maine's heart.

Christopher Crosman *is director of the William A. Farnsworth Library and Art Museum in Rockland.*

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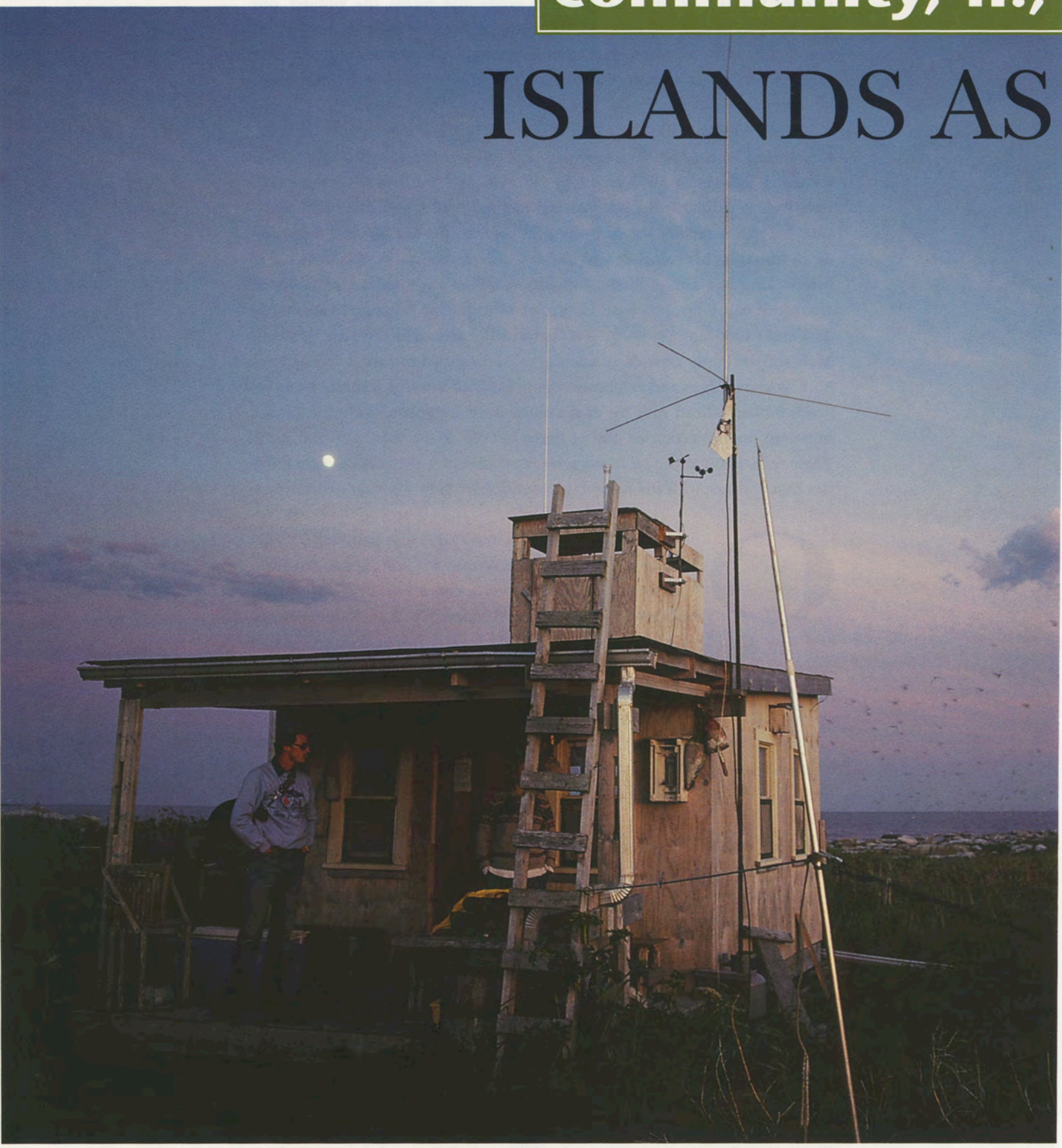
ISLANDS AS



Research camp, Eastern Egg Rock

An assemblage of animals or plants living in a common home under similar conditions.

Peter Ralston

BIOLOGICAL COMMUNITIES

Islands are interesting and important, writes David Quammen, because they are especially conducive to evolution and extinction. Islands are also tools for environmental diagnosis, he suggests, because all of the world's mainland landscapes are now being reduced to island-like fragments.

Quammen's scope was appropriately global when he lectured at Bowdoin College last fall under the sponsorship of the Island Institute and the college. He reflected on the ten years of research and writing that went into The Song of the Dodo, *his recent book on islands around the globe and their role in the natural world.*

Yet his message — that islands have much to tell us about the condition of the Earth and its natural systems — is as appropriate to the islands in the Gulf of Maine as it is to faraway places like the Carolines, the Galapagos Islands, Hawaii or the Mascarenes. For a century or more, researchers have known of islands' value as laboratories for the study of populations of birds, mammals and plants — and, more recently, as valuable jumping-off spots for the study of marine mammals and other marine communities.

An excerpt of his remarks follows.

Ever since Charles Darwin got back from the Galapagos, biologists have realized that islands produce more different species, and species that are more extravagantly different, than mainlands do. Islands are havens and breeding grounds for unique and anomalous species of all sorts. They are hothouses for wild evolutionary innovation. Why is that? The basic reason is isolation. Geographic isolation is a crucial part of what makes the evolution of new species possible. Islands simply provide more situations of geographic isolation than do mainlands. That is completely self-evident.

The Galapagos Islands are especially famous for their endemic species, but that is really only because these islands are where Charles Darwin happened to stop in the course of the voyage of the BEAGLE and saw this phenomenon in the flesh. If Darwin had stopped in the

Hawaiian Islands instead, which he could just as well have done, he would have seen the same sort of thing — evolution made particularly dramatic and manifest — and we would now hear all about Darwin's honeycreepers and Darwin's fruit flies instead of Darwin's finches. But [what is true of the Galapagos Islands] is equally true of islands all over the world; they are full of evolutionary oddities. ...

Within recent centuries, and probably throughout all time, islands have been death traps for species. Within the past 400 years, 171 species and subspecies of bird have been recorded as going extinct; of these, 155 were island forms of birds. That's about 90 percent, despite the fact that only about 20 percent of the world's bird species and subspecies are endemic to islands. On a global scale, it means essentially that island birds face about a 50 times greater likelihood of extinction than mainland birds.

The most famous of all extinct island species was from the Mascarenes, a little cluster of three volcanic islands in the Indian Ocean: *Raphus cucullatus*, as it is known to science; the dodo, as it is known to the rest of us. There are no stuffed dodo specimens in any of the world's museums; all we have are a pile of bones that have been assembled into a couple of complete skeletons and some other bone fragments. The dodo is practically the poster child of extinction. What I mean by that is that it is the symbol of all the species that humanity has managed to eradicate because those species weren't quite as resilient or as adaptable as they might have been. . .

By about 1680, the dodo was extinct. But it didn't just become extinct; it very quickly became famous for being extinct. It captured imaginations in the European world, because it was big, ugly, helpless, strange — and because it was the first case in which humans realized that we ourselves had caused the extinction of a species. A biologist named Carl Jones, who works on the island of Mauritius, has told me that he thinks that was a watershed moment in the dawning of human consciousness about our relationship with the natural world: we saw that a species was extinct, gone forever, and we knew we were responsible for that extinction.

So what is it about the island situation that entails this special jeopardy of extinction? The basic answer is simple: islands, because of their limited area, support only small populations of any given plant or animal species, and small populations are more likely to be wiped out. What wipes them out? Various causes. It might be an exotic predator that has invaded the island. It might be a volcanic eruption or catastrophic drought or a huge fire. It might be humans hunting the species, destroying its habitat. Or, more likely, it might be a combination of those factors, a combination of direct persecutions and unlucky accidents that pushes a population below its threshold of genetic viability. There are too few left for it to be a healthy, sizable gene pool. That leads to inbreeding and inbreeding depression.

The point about all of this is that all populations of animals and plants naturally fluctuate in size, from time to time, in response to the good conditions and the bad conditions that they encounter. In a series of good years — mild winters, plenty of food — a population tends to fluctuate upward. Then there might be a series of bad years — predators and competitors are abundant, disease outbreak, drought — and the population fluctuates downward. All natural populations fluctuate in size, from time to time, in response to these factors. And small populations — meaning, in particular, island populations — are more likely to fluctuate to zero when conditions are bad, because zero is not far away. Rarity itself is the foyer of extinction. And island species tend to be rare. ...

Islands stand as warnings about the processes that affect any small, isolated patch of landscape. That is a crucial truth nowadays, as all the world's mainland ecosystems are getting chopped up into small, isolated patches. We all recognize that humans have spread across the continents, conquering wilderness, leveling forests, draining swamps, building roads, slicing the world into pieces by means of clear-cutting and fence-building and road-building and all the other things we do in the name of civilization and development.

Where wild lands do still exist, they have, in most cases, been left isolated, as relatively small fragments of the great mainland ecosystems of past ages. What isn't so widely recognized is that these fragments — surrounded by our highways and suburbs, our rice paddies and our villages, our farms and golf courses and malls and drive-in movies and Starbucks franchises — are becoming ecological islands in an ocean of human impacts. This is a crucial truth because, as islands, they are subject to that island syndrome I have mentioned, that special jeopardy of losing species to extinction. ...

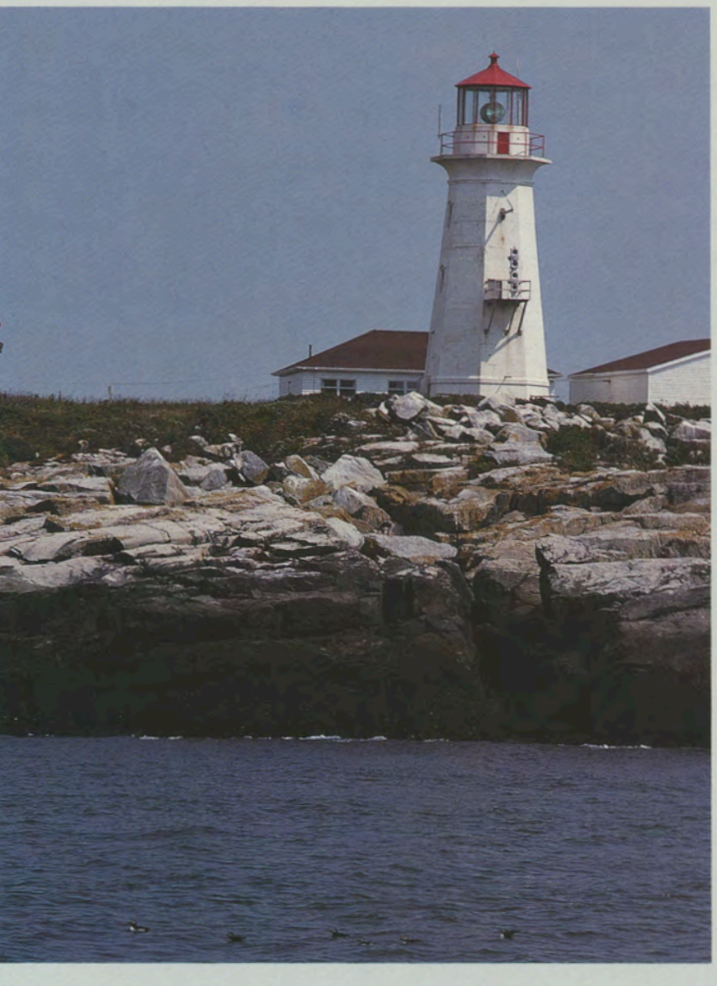
Island biogeography is the study of what species live on which islands. But the phrase has a second sense that is slightly less literal, although just as important. In this broader sense, island biogeography encompasses the study of any isolated patch of landscape. A patch of forest surrounded naturally by grassland is an island as far as forest-dwelling species are concerned. A patch of swamp surrounded by airport runways is an island, if you happen to be a frog. A lake is an island, if you happen to be a fresh-water fish.

— David Quammen

A review of The Song of the Dodo *appears elsewhere in this issue.*

MACHIAS SEAL

CROWDED WITH BIRDS AND RESEARCHERS



More than 2,500 pairs of Arctic terns nest on Machias Seal Island, making it the major breeding ground for the species in eastern North America, including the Gulf of Maine. According to A. W. (Tony) Diamond of the University of New Brunswick in Fredericton, the island is also the largest Atlantic puffin colony south of Newfoundland, with more than 1,000 nesting pairs. Razorbills, Common terns, Common eiders and a few Leach's storm petrels breed here too, as well as "a considerable variety of migrating songbirds and shorebirds stopping by."

Arctic terns banded on Machias Seal Island have been recovered as far away as South Africa, Brazil and Scotland.

Not surprisingly, the island has been a magnet for researchers. Pioneering ornithologists such as Olin Sewall Pettingill, ——- Hawksley and Jeremy Hatch studied Arctic terns here from the late 1930s through the 1970s. Diamond has students working there today, looking at the diets of seabirds as indicators of changes in the marine ecosystem, and as a way to predict recruitment (growth) in herring stocks. David Nettleship of the Canadian Wildlife Service is investigating the condition of young puffins as they fledge, as well as puffin demographics.

Research is funded by the Canadian Wildlife Service and the Atlantic Cooperative Wildlife Ecology Research Network (ACWERN), which Diamond directs.

Diamond plans to continue research on seabird diets and demographics in relation to changes in the marine ecosystem, from his base at the University of New Brunswick. Some research on habitat improvement for terns is likely as well.

For the record, Canada's title to Machias Seal isn't entirely clear. The island lies on the U. S. side of the "Hague Line" dividing U. S. and Canadian waters in the Gulf of Maine, and United States citizens have asserted claims to the island at various times. Canada has maintained a light station there for many years, however, and considers the island to be Canadian territory.

Tony Diamond (2)

College of the Atlantic

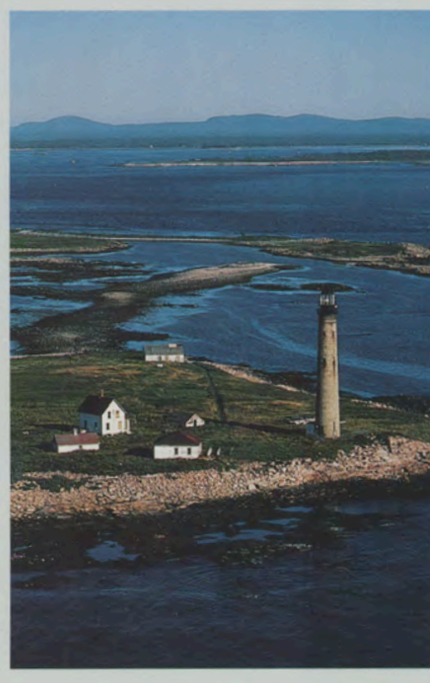
An emphasis on early field experience

Petit Manan

Ship, Trumpet and Barges

Roque

Mount Desert Rock



Four islands or island groups in the Gulf of Maine — Petit Manan; Ship, Trumpet and Barges; Roque; and Mount Desert Rock — have seen active use for research by students and faculty at the College of the Atlantic (COA) in Bar Harbor. Work on and around these island outposts has concentrated on seabirds and marine mammals, although in one case on Roque students did an intertidal inventory for the island's owners. Remote Mount Desert Rock, currently not in use by the college, was the site of a pioneering effort to photo-identify individual whales.

Of the inshore islands, Petit Manan is "the most interesting of the three," says John Anderson of the college's Center for Island Studies. That's because it's on the edge of the range for several species: the southern limit for puffins, Arctic terns and guillemots; the northern end of the range for Common terns.

All of these overlapping populations breed on Petit Manan, Anderson explains. "When you get this sort of mixed population, nest site selection offers a very exciting opportunity for study," he says, including the occasional hybrid Roseate/Common tern. A quarter of the chicks of all species (and all puffin chicks) are banded annually.

Peter Stevick (2)

Regional relationships among the various islands and their bird populations are equally interesting to Anderson and his students. Many of the breeding birds are recent returnees to the islands, the beneficiaries of gull-killing experiments carried out a decade ago by the US Fish and Wildlife Service and the late William H. Drury, a wildlife ecologist at COA. Coast Guard brush-cutting and grass mowing had kept nesting gulls in check during the years the islands were used for manned light stations, but when the stations were automated and the guardsmen departed, the gulls proliferated, driving out the nesting terns.

Ship, Trumpet and the Barges, an island group in Blue Hill Bay owned by the Fish and Wildlife Service, "became the next step in the tern project [after Petit Manan]," Anderson said. "If we got rid of the gulls, would the terns come and nest?" Gulls on Ship, Trumpet and one of the Barges were dispatched in 1993. A few terns appeared almost immediately, followed by successful nesters the following year. Last year, 80 pairs nested on the islands, "We think they're Petit Manan birds," Anderson said.

Puffins tell a different story: numerous in Canada, they reach their southern limit in Maine. "Generally puffins are extending south," notes Anderson, suggesting that climate change may play a role. A few puffins have nested on Petit Manan in recent years, and last year, four of the six birds hatched and banded in 1993 returned. "That's an incredibly high survival rate," Anderson said.

Roque Island, east of Jonesport and privately owned for a century and a half, provides opportunities for different kinds of studies. "The owners are interested in ecological assessments," Anderson said. "We're doing an ecological inventory of the intertidal zone." COA students there last summer put data from the whole island into a geographic information system (GIS). Of particular interest was Roque's famous mile-long sand beach. The island's owners wanted detailed baseline information about the beach's present condition, in case it ever faced cleanup following an oil spill. (In Prince William Sound, Alaska, overzealous cleanup crews scoured the shoreline and intertidal zone, doing as much damage as the oil itself.)

In 1973, not long after the founding of the College of the Atlantic, students and faculty made the 23-mile trip offshore to the manned light station at Mount Desert Rock, to see what they could learn about the whales that frequented that part of the Gulf of Maine. The island is further out than any other island on the East coast, according to Peter Stevick of Allied Whale, the college's whale research unit. "It's in very deep water; it's a pelagic setting; it's so exposed; it has very little vegetation; it has sea birds like shearwaters, as opposed to terns; it's the kind of place where food fish for whales congregate — that's why the whales are there. Everything we've seen points to that," says Stevick. It was a perfect place to learn about whale habitat, why the creatures congregate where they do, and how they behave. Equally important, Mount Desert Rock offered an ideal offshore platform from which to photograph whales at what researchers then believed might be one end of an ocean migratory route between the Gulf of Maine and Bermuda or beyond.

Randy Ury

Photo-identification proved practical and successful. Research at Mount Desert Rock subsequently branched out into genetics and other areas.

The college's arrangement to use the island's limited facilities depended on the Coast Guard, and when Mount Desert Rock's lighthouse was automated in 1993 and its crew departed, the students were obliged to leave, too.

"We'd like to continue to use Mount Desert Rock for education and research," says Steve Katona, a pioneering whale-researcher who became COA's president a few years ago. Given the opportunity in the future (which will depend on what can be worked out through the recently created Maine Lights Program), Katona would expand studies to include "not just whales and seabirds but also invertebrates, plankton, water chemistry." Better yet, he'd like to see Mount Desert Rock be "a small, special facility for teaching people about biology of the offshore waters of the Gulf of Maine, where we could continue our early commitment to inviting teachers and others interested in education to visit and study."

Like the other islands with which it has associated itself over the years, Mount Desert Rock offers the kind of experience COA wants for its students. "We get a lot of students who want to be field ecologists," says John Anderson. "At a lot of colleges, field experience gets put off; we try to reverse that."

KENT ISLAND

SIXTY YEARS OF FIELD STUDIES

Nat Wheelwright (2)

The last vegetated island south of Grand Manan, Kent Island has been used continuously as a center for biological studies for 60 years. Records of the island's weather and migratory bird populations extend back to the 1930s, documenting small and large changes since then.

Kent Island was deeded to Bowdoin College in 1935 by the Rockefeller family. Allan Moses, a pioneering bird collector from Grand Manan, had suggested the gift to J. Sterling Rockefeller six years earlier, when the two of them were on a collecting expedition in Africa. Over the years since then, wrote Moses's biographer, L. K. Ingersoll, Kent Island has served as a highly successful outdoor laboratory and bird sanctuary, "where naturalists and scholars observe eiders and all other forms of pulsing life in their natural habitat, study them, and protect them."

The Rockefeller gift was fortuitous for the college as well as the island's wildlife. "For field biology, I don't know of any other field station which ranks as high in terms of bang for the buck," says Nat Wheelwright of the biology department at Bowdoin College. Sixty percent of the undergraduate students who spend time on Kent Island go on to graduate school in the sciences — a very high number, considering that Bowdoin is best known for its liberal arts programs.

Each year, Wheelwright selects eight students to spend the summer on Kent Island. Most are juniors, and they work from a list of possible projects. "It's pure research," Wheelwright says. "You sink or swim. The students are carefully picked because they look like type that can take the ball and run." In return for the privilege of doing field work on Kent Island, the students "rub shoulders with bigshots."

For half of its existence, the major bigshot at Kent Island was Charles E. Huntington, a legendary teacher whose principal interest was birds. "Chuck" Huntington promoted "a sense of old-fashioned-ness while doing good science," recalls Wheelwright. "The sense of community" was particu-

Student researchers have documented changes at Kent Island since the 1930s.

larly important and continues to be so today, as students gather wood, tend a summer garden and maintain the few simple buildings the college has built, along with a new laboratory. "Chuck was very focused on birds. I'm more focused on birds and the things they interact with," Wheelwright says. "I encourage a diversity of projects, but what makes biology interesting is the birds."

Lying 200 miles northeast of the Isles of Shoals, Kent Island is the Gulf of Maine's northernmost island biological station, and Wheelwright is very aware of this context. "I see it as part of a series of field stations for learning about birds plus environment," he says. "Its biology is different in a number of ways: it's more 'northern'; it has more boreal species; it has a huge tidal flux (20 feet); it's colder, foggier." There is room for more cooperation among the various biological stations, perhaps the encouragement of comparative studies.

Wheelwright sees the island as a "theater of evolution, a place to study species isolated from mainland populations." Savannah sparrows, for example, breed on Kent Island as one year olds, 50 meters from the place where the hatched. "We're looking at how they avoid mating with relatives."

Sixty years of data means one can begin, at least, to notice changes. "We've had lots of blink-outs and blink-ons," says Wheelwright, referring to new species that show up or familiar migrants that don't return. Whole populations of the island's banded black-capped chickadees and goshawks have "turned over," that is, come and gone; the average summer temperature has risen two degrees Fahrenheit in 58 years; over the same time period, the familiar fog has become more acidic.

Much remains to be done. Kent Island's mammal populations — muskrats, bats and hares — haven't been studied yet. Five hundred species of insects have been identified, but more remain. "By the time I end my career I'd like to be able to walk around Kent Island and name everything," Wheelwright says. "I've thrown myself into it."

Allen Island

Agriculture to Aquaculture

Four miles south of Port Clyde, between Penobscot and Muscongus bays, Allen Island's sheltered harbor drew European visitors as early as the seventeenth century, when English explorer George Waymouth spent a season there. Used first as a base for fishing and subsequently as a home for fishermen-farmers, Allen's abandonment, like that of other coastal islands, began in the late nineteenth century. Its forest of spruce and birch grew back, obscuring the once agricultural landscape.

Allen's modern-day owners, the Wyeth family, took an interest in restoring the island's fields and testing the idea that a Maine island could once again become at least partly self-sustaining through agriculture and other activities. With assistance from the Island Institute, almost a quarter of the island's 450-acre forest cover was cleared and barged ashore in the early 1980s; a wharf and new buildings were built, and flocks of sheep and a series of caretakers moved onto the island.

The fields, sheep and caretakers remain today, but the focus has shifted to aquaculture. In June 1996, Allen became one of three sites for a comparative study of suspended mussel culture. Participants in the study, the Island Institute and Pemaquid Oyster Company, deployed rafts at Allen, Frenchboro and a site in Blue Hill Bay to learn where juvenile mussels are most likely to "set" successfully. "Knowing that a site will be productive before a venture is launched," wrote project manager Corrie Roberts, "would save money and time, expediting the economic development of coastal and island communities." Pentecost Harbor, the same sheltered spot that attracted George Waymouth three centuries ago, "is an excellent site for raft culture providing good shelter from all sides," according to Roberts. "Because of the oceanic conditions, the waters near Allen and Benner [the neighboring island] are particularly rich with nutrients and dissolved oxygen." Sea water temperatures in Pentecost Harbor are consistently warmer than they are in the surrounding area because of restricted flow, allowing mussels to grow at faster rates.

Bob Coombs (2)

The suspended-culture experiment will continue at Allen and other sites as more rafts are deployed, sea water is monitored for mussel "spat" and financing methods for fishermen interested in mussel raft culture are explored. The Allen Island project will be further enhanced with the leasing of a former lobster pound in Port Clyde to serve as a shoreside staging and laboratory area.

ISLES OF SHOALS

19TH CENTURY CULTURE, 20TH CENTURY RESEARCH

Eastern Egg Rock
Hog Island
Seal Island


Shoals Marine Laboratory

Six miles off the Maine and New Hampshire coasts, the Isles of Shoals were a fishing and trading center in early colonial times and — as the home of poet and gardener Celia Thaxter — a cultural outpost in the late nineteenth century. Today one of the islands, 95-acre Appledore, is home to a research and teaching center jointly operated by Cornell University in Ithaca, New York, and the University of New Hampshire (UNH).

The Shoals Marine Laboratory (SML) describes itself as "a seasonal field station dedicated to undergraduate education in the marine sciences," and doesn't directly sponsor research. Over the years, however, scientists have brought their own projects to the island, focusing on topics ranging from the island's resident gulls and migrating songbirds to the treatment of island-generated sewage. Undergraduate students have compiled 30 years' worth of data on Appledore's intertidal zone and its plant and animal populations.

Appledore has a heron rookery and thousands of nesting gulls, and more than 125 species of pelagic and migratory birds use it as a resting spot.

Like other islands used for research in the Gulf of Maine, Appledore and the other Isles of Shoals lie at or near the extremes of breeding ranges — at times they have been at the northern edge for breeding herons, for example, and the southern limit for breeding harbor seals — providing an island "platform" to study why such limits fall where they do and what happens as species expand or shrink their ranges.

The biological diversity of the island and its surrounding waters began to attract interest about 1919, and scientific work at the Isles of Shoals began in earnest in 1928 with the establishment of the University of New Hampshire Marine Zoological Laboratory. Except for a 25-year hiatus during which the island was used for military purposes during World War II and then abandoned, research and teaching have continued ever since. Cornell and UNH undertook their joint venture on Appledore in 1971 and built a modern laboratory there in 1973. The laboratory is equipped with bench space for 60 people, compound and dissecting microscopes and sea tables with running seawater for maintaining organisms. There are two smaller labs, while other buildings on the island house academic and operating staffs. A research vessel, the 47-foot R/V JOHN M. KINGSBURY, was delivered in 1984.

SML's academic program, according to information published on its site on the World Wide Web, "includes over 20 credit courses for undergraduates, graduates and professionals, several adult education courses open to any interested persons, tours of Celia Thaxter's historic garden and a program for high school juniors and seniors. Our academic staff hail from academic institutions throughout the U.S. and Canada as well as professional fields, where relevant." Shoals Marine Lab may be contacted at SHOALS-LAB@Cornell.edu.

— With information from the Shoals Marine Lab's site on the World Wide Web

Audubon Islands

Bringing back the puffins

Peter Ralston (3)

For the past 24 years, the Atlantic puffin has been the centerpiece of research on Eastern Egg Rock in Muscongus Bay and Seal Island in Penobscot Bay. Focusing largely on ways to reintroduce a species that was extirpated from the area more than a century ago, the work has been carried out by the National Audubon Society under the direction of Steve Kress, an ornithologist.

Between 1973 and 1989, Kress transplanted nearly 2,000 puffin chicks from Newfoundland (where they are common) to Maine, the southern edge of their range, where they had been extinct since the 1880s. The chicks were hand-reared in specially built burrows; at the appropriate age they were banded and released for the two to three years these birds must fend for themselves at sea before returning to land to breed.

The puffins that have survived their "adolescence" on the ocean must then be lured back to their "native" island to nest, leading to experiments with decoys and taped bird sounds, all designed to convince passing puffins

Grand Manan

"An accumulation of prey species"

Lying just northeast of an area known for its nutrient-rich upwelling seawater, the large Canadian island of Grand Manan is "a great starting-off place for research," reports Laurie Murison of the Grand Manan Whale and Seabird Research Station. The station maintains offices and a small museum in the village of North Head, well known to visitors as the place where the Marine Atlantic ferry docks after making its daily crossings from Blacks Harbour, New Brunswick.

"Grand Manan is a feeding area, one of the better ones in the Gulf of Maine," Murison points out. The combination of tide, the position of the island, and the ledges surrounding it "all lead to an accumulation of prey species."

that the heretofore empty islands were, in fact, already being colonized by breeding birds. The tricks worked: in 1981, five pairs of puffins nested on Eastern Egg Rock for the first time in over a century. Ten years later in 1991, 16 pairs were nesting.

Successful bird re-introduction also requires predator control (gulls are a particularly serious problem on islands, where they compete with terns or puffins) and developing means to keep vegetation from obscuring nest sites. Kress made use of landscape fabric (which prevents plant growth) covered with wood chips, and removing gulls helped Common and Arctic terns re-establish nesting grounds at Eastern Egg Rock, which now supports Maine's second largest colonies of Roseate terns.

Kress's projects, managed under the National Audubon Society's Maine Sanctuary Program, have employed 65 summer interns over the years, many of whom have since become full-time biologists or have earned Ph.D.s in the field. Another island-based Audubon project in the Muscongus Bay area is an "Ecology Workshop" in the 333-acre Todd Wildlife Sanctuary on Hog Island, established in 1936 as an experiment in nature education for teachers and other adults.

— With material from the National Audubon Society site on the World Wide Web

Research work at the station is done by a core of three or four persons, plus visitors, Murison says. "We provide room and board and a place for them to work."

The research station was incorporated as a nonprofit institution in 1981 with Dr. David Gaskin of the University of Guelph in Ontario as executive director. Early work focused on the feeding ecology of seabirds, but in recent years the emphasis has shifted to marine mammals, principally the harbor porpoises and finback and right whales that frequent the local waters.

Researchers affiliated with the station have radio-tracked and satellite-tracked porpoises and right whales. "In 1995," Murison says, "we tracked a porpoise by satellite from here to Cape Cod for seven months, which is the longest such tracking on record." (Last year, perhaps because herring were further offshore, whale and porpoise populations were lower in the area, and tracking efforts were less successful.) Extensive aquaculture operations in the Grand Manan area have led to other types of marine-mammal studies, including the problem of seals that prey on penned fish. "We usually work through a weir-release program," Murison says.

MARINE COMMUNITIES

Under water, the connections are everywhere

TED AMES

FOR CENTURIES the fisheries of the Gulf of Maine have produced a magnificent bounty of seafood. Fish and shellfish once seemed so abundant that the stocks were thought to be inexhaustible. Unfortunately, we have found otherwise, and in recent years we have so overwhelmed the Gulf's natural productivity that a number of species have been virtually eliminated from large areas of the coast. Others are seriously depleted.

Though biological diversity has been reduced, the Gulf of Maine continues to be very productive. Some species are abundant and continue to provide robust fisheries. Exactly how and why the Gulf responds to man's intrusion in the way it does is only now becoming clear.

The Gulf of Maine owes much of its biological productivity to the peculiar combination of geology, tides, currents and seasons. It is a leftover from the last Ice Age, with drowned mountains and rivers surrounding deep marine basins to form a very irregularly shaped basin.

When tides and currents encounter these barriers, they are forced from their paths and create numerous expanses of upwelling and eddy. Deeper currents draw nutrient-rich water upwards to the surface to host an abundance of marine life.

Other nutrients come from the land. Rivers and streams along the Gulf's northern rim pour their contents into its bays, diluting its salinity and enriching it with runoff to form an inner body of water that becomes sandwiched between the land and 50 fathoms by the Maine Coastal Current.

During their seasons, plankton multiply to create enormous populations. Directly or indirectly, they become a feast for all marine creatures.

FISHING COMMUNITIES

Fringing the shores of the Gulf of Maine are coastal towns and villages that have depended on harvesting the sea for centuries. Fishing is the natural business of these places and fishermen have lived there, pursuing cod and a multitude of other seafood. The perennial song of the bay has been, "The fish're in!"

Like the species they pursue, fishermen have adjusted to the complex marine world that surrounds them, responded to the secret inner rhythm of the sea, changing their fisheries and scale of effort to match changing markets and the abundance of particular stocks.

Community infrastructure reflects this. Different vessel types and support facilities appear as fisheries change, and like the biological communities they depend on, these shoreside niches have adjusted to accommodate a changing ecosystem.

At first, the changes occurring in the ecosystem seemed to be the result of natural variations. But as fishing technology improved, the changes seen in the marine environment have often been attributed to overfishing.

Many who fish for a living challenge this conclusion and insist that these are only natural variations in the system. A peek at how marine ecosystems work lets us see if that could be true.

Peter Ralston

Ecol. ***An aggregate of organisms with mutual relations.***

BENTHIC COMMUNITIES

If you examined a tidal pool along the edge of the Gulf of Maine, you would see abundance and variety in the creatures living there. They are not found everywhere; different kinds of marine organisms exist in mud flats and other habitats.

Each locale hosts its own unique community of species that are better adapted to its conditions. Stationary species are lifelong residents of their communities and include seaweeds, barnacles and worms. Others are transient or seasonal and stay only as long as local conditions are acceptable.

If you looked closely, you would find that wherever the habitat changes, the mix of species within a community also changes.

That difference reveals the preference and tolerance of a species for a particular type of bottom, current strength, salinity and other features. Such preferences include the available food supply, shelter and the presence of predators and competitors.

This creates a patchwork of different communities abutting each other, reflecting the changing habitat. Ultimately, these form a vast mosaic of communities that covers nearly every square inch of bottom throughout the Gulf of Maine. But these are not the only biological communities present.

Robert Michelson

PELAGIC COMMUNITIES

Creatures living within the water column form pelagic communities, many of which overlap with bottom communities. Pelagic communities are usually separated by indistinct boundaries between bodies of water that vary with time — the interface at the edge of a current, the temperature gradient, or the depth that light can penetrate.

Many key members are tiny and include plankton whose abundance depends on the season (light intensity) and the concentration of dissolved nutrients. The eggs of most benthic and pelagic community members are released into the water column, their larvae feeding on plankton and each other until they metamorphose and become part of some other community.

Species grazing on this living potpourri include creatures from the benthic community, like barnacles and scallops, and others from the pelagic community that range in size from zooplankton to herring to whales. Still others, the cod, pollock, hake, seals, whales, etc., eat the grazers. Many of those feeding are themselves recent survivors of earlier plankton stages, now grown.

Unlike the patchwork segregation existing below them, the mixture and abundance of species in pelagic communities are in a state of constant change. This creates a tenuous, almost ephemeral collection of species that migrate seasonally to areas where the essential plankton abundance is occurring. While somewhat predictable, the actual times of arrival, locations, and character of the pelagic community are inherently variable.

CHANGE

A tidal pool visited each summer over a long period of time would appear to change little. The kinds of creatures found there one summer would probably still be found there during the next, indicating a remarkably stable biological community living in a remarkably stable place.

But this is misleading. Only those who can best accommodate the stresses of a habitat will inhabit it. Tidal pool creatures are there because they can tolerate living under those conditions better than others competing for the same niche.

Those species may visit and even stay for a period of time, but when conditions become too severe, they must move to more agreeable locations. Those left behind must endure the new conditions or die.

Such changes occur each season in the Gulf of Maine. To the uninitiated, whole populations seem to appear mysteriously in one area, remain for a period of time, and then disappear once again. Those more intimately connected to the marine environment realize this nearly continuous movement of species is the normal condition.

Change is, in fact, the most obvious constant in the sea. Its inhabitants are attuned to its timeless rhythm, and have orchestrated their life cycles to coincide with it. This ensures that proper conditions occur at each life stage, which, in turn, ensures the collective survival of each community in a delightfully complex series of events.

LINKAGES

Stepping back, we see that the life found in a tidal pool is not only a community of interdependent creatures living together, but the tidal pool community itself is dependent on a larger, more complex community for its maintenance and survival. The converse is also true, for the sum of community interactions describes the well-being of the Gulf of Maine.

Some interactions between biological communities, for example, involve species that belong to different communities during different stages of their lives. In fact, the developing stages of marine life often demand a whole series of different communities for critical habitat.

Cod, scallops, lobsters and a host of other commercial species have life histories of this type. Such species have synchronized their spawning to coincide with seasonal plankton blooms. Timing is critical, for successful reproduction depends on the eggs hatching when the plankton are still small enough to eat. If the larvae arrive too early, they starve; too large, and they are eaten.

Survivors of pelagic stages then occupy a sequence of critical subtidal habitats in nursery areas of the Gulf of Maine. These different biological communities must be close enough together for the juveniles to shift to and from, for as they grow larger, different prey are needed for food and different shelter becomes necessary for protection from predators.

If one of these critical biological communities is too far away, or is too damaged to support them, a bottleneck forms that makes it difficult for the species to maintain itself in that area.

The bottleneck need not be absolute. But when it occurs, there will be fewer of that species to eat the available prey. Over time this shift in "who eats whom" redirects the flow of energy through the food web to competing species, making it more difficult for the restricted species to hold onto its niche.

At some point, when too few survive, the local population will collapse. In turn, this induces a chain reaction where each of the several habitats once lived in would have vacant niches. If the missing species were a critical food source in some of those communities, other species would disappear, too.

The loss of cod, for example, would not just affect the herring, crabs and lobsters being eaten by adult cod. The spring and summer pelagic communities, and a host of benthic communities in which the cod live while growing from inch-long, post-metamorphic juveniles to adults, would have to find a substitute prey for the missing cod if they were to survive. Cod eggs and larvae are eaten by herring, mackerel and scallops, but when they become juveniles, these are eaten by many different fish, shellfish, marine birds and mammals.

Having these interrelationships linked through a series of biological communities moderates the effect a species may have on others within the system. Unfortunately, we have succeeded in bypassing these restraints with potentially disastrous effect.

THE FISHERMAN'S DILEMMA

When a successful year-class of cod appears in a natural system, many survive because predators can't eat them all. The number of predators will increase, but because it takes time for them to reproduce and grow, and because other factors affect how many survive to become adults, they increase more slowly.

This creates a living surplus and a cushion for the ecosystem against poor year-classes of cod in the future. Eventually the system adjusts to a new balance between cod, their food supply and predators.

Fishermen are ultimately bound by the same limits that constrain natural predators; but unlike predators catching food, they are motivated by the price of cod in the market. If the price is up, large numbers of fishermen will enter the fishery. This increases the number of predators much faster than would occur naturally and the number of cod is quickly reduced. This eliminates the cushion, and makes the stock susceptible to further declines in abundance.

New technology has had a more subtle effect on abundance. Technology seems to be a natural proclivity of humans, and in the short term, it lets fishermen catch more fish, more easily.

But there aren't more codfish, even though there appear to be. Instead, the cod that were previously inaccessible can now be caught. New technology has made the fisherman a more efficient predator.

With each new device, fishermen have been able to reduce stocks to ever lower levels. With fewer fish remaining, they again have to work harder to catch

them. Fishermen using the old gear have usually been starved out. They had become less efficient predators.

In fact, landings continue to drop until the increased efficiency of the new gear is offset by the ability of the remaining cod to sustain their population. In the past, a new balance formed, but with a smaller stock of cod more susceptible to decline and collapse.

Until recently this allowed both fishermen and cod populations to maintain themselves in uneasy balance, for fishermen, you see, were still functioning as part of the ecosystem. It is this balance that needs to be recaptured.

Looking over the abandoned fish plants and neglected groundfishing boats along the coast, it seems obvious that the submerged hangouts of cod are not the only habitats that have been emptied. A surfeit of ex-fishermen is blunt testimony to what happens to predators when the prey's all gone. The niche they once occupied has also been abandoned.

The bustling factories and busy coastal towns were, in the final analysis, only an artifact of the ecosystem and fishermen, too, are ultimately bound by the same natural laws as were the cod.

Too many commercial species have disappeared from our coastal waters for us to ignore the obvious. The combination of modern electronics with large fishing vessels has created a technology too powerful for stocks to withstand. The balance no longer exists.

The atrophy of groundfishing along Maine's coast is a stark reminder of how fragile our marine ecosystem is. While the loss of cod, haddock, herring and winter flounder from our bays is tragic enough, we have far more to lose if we fail to protect the web of biological communities that sustains all our fisheries.

Our losses have been local. Catching too many haddock on Georges Bank didn't cause the collapse of haddock in Penobscot Bay. It was caused by damaging critical nursery habitats while catching up the fish around Perry's Ledge, Sunken Seal Island and Bay Ledge. If fishermen want to see haddock back in Penobscot Bay, those are the areas they have to start protecting.

To advise "You are catching too many" simply doesn't provide fishermen with a constructive course of action. To make them realize how important local events are, could. Protecting local spawning habitats and nursery areas provide the key to using the Gulf of Maine's productivity more effectively. We need to fish smarter.

***Ted Ames** fishes and writes in Stonington. For the Island Institute, he has mapped historic cod and haddock spawning areas along the New England coast.*

Whales

FIND THEM WHERE THE FOOD IS

To human eyes the surface of the ocean can be a desert — just waves, maybe the occasional seabird. Suddenly the surface is parted; a whale or dolphin emerges for a few quick breaths and then silently slips below.

The brief appearance of a cetacean (a whale or dolphin) can change the ocean "desert" into an arena of life while revealing a picture, albeit still a clouded one, of interactions within the subsurface marine community.

Each summer, thousands of tourists venture out to sea, almost as sure of sighting a whale as if they were traveling to an aquarium. Whale watching boats take them to places called the Ballpark, the Rock, the Kettle, the Fingers. The tourists are rarely disappointed; something attracts whales and dolphins to these locations year after year.

A study of the distribution patterns of whales and dolphins is largely a study of the ecology of the distribution of their prey. Cetacean distributions are far from regular or random; they are, during the feeding season, where the food is. A naturalist scanning the ocean searching for the first whale of the day isn't really looking

Peter Stevick, College of the Atlantic

for whales per se, but for a "hot spot" — an accumulation of seaweed or driftwood, circling sea birds, small whitecaps where there is no wind — any sign that might indicate a pocket of productivity. The signs tell of oceanographic features below, perhaps a change in sea-floor topography that causes local currents, upwellings or downwellings, a change in the temperature structure of the water column that might help condense small prey.

After a whale emerges, it is not uncommon to see associated sea birds capitalizing on prey brought to the surface by currents the whale created as it surfaced. Sea birds may fly precipitously close to the open mouth of a humpback, stealing a few morsels right out of the whale's gape, fleeing just before the jaws close tight.

Cetaceans provide useful clues to the locations of other marine mammals. Many early authors classified cetaceans on the basis of food habits, essentially a list of prey species as determined from examination of stomach contents of stranded animals or on the deck of a whaling ship. Cetaceans are extremely mobile, long-lived, top-level predators. Many species come to the Gulf of Maine in the summer and fall to take advantage of the seasonally rich productive waters. Some prefer the same prey, primarily schooling fish such as herring, sand lance and mackerel — or plankton including euphausiids and copepods. A marine community, like a terrestrial one, is a sophisticated system of many species in close relationship.

Two whale hot spots off Bar Harbor, Maine, are the focus of an Allied Whale study of resource "partitioning." To a surface-bound observer both whale species seem to be feeding side by side. Upon closer examination, it appears as if the two species have slightly different preferences, using slightly different portions of the habitat. Fin whales generally appear in deeper water with greater sea-floor relief and greater thermal stratification, presumably feeding on prey that concentrate at greater depths. Humpbacks are found in shallower waters over a nearly flat sea bottom with little temperature stratification, apparently feeding on prey that concentrate nearer the surface.

Cetaceans are better at finding their food than we are. There are many accounts of fishermen using cetaceans to help fill their holds. Along the southwest shore of Nova Scotia, for example, fishermen using purse seines to catch herring look for the "blows" of fin whales before setting their nets. They say their herring catches are greater if they set near feeding fin whales. Weir fishermen in the Bay of Fundy claim that the fin whales push the herring closer to shore. Once they see whales in the early summer, they know their weirs will soon fill with herring.

We use cetaceans to draw conclusions about the species composition of the communities below. In 1986 on Stellwagon Bank, whale watchers saw virtually no humpbacks, but were treated to a summertime residency of right and sei whales. Sampling of marine species revealed no sand lance, preferred prey for humpbacks, but did uncover an unusually high abundance of copepods, the favorite of plankton feeders like right and sei whales. As whales' primary prey changes, they have only a few options: to migrate, to fast, to switch to another food source or continue to feed on remnant preferred prey. In 1986, the humpbacks left the Stellwagon Bank area entirely. Where did they go? What will bring them back? And when? Answering these questions will be easier if we understand whales' preferred prey species and where they are likely to occur.

— Moira W. Brown
Allied Whale, College of the Atlantic
Bar Harbor, Maine

Plankton

Integral to the Fisheries

Long before the snow melts from the rocky mainland, spring comes to the Gulf of Maine. Beneath the surface chop of the coastal waters, an explosion of life begins, fed by the nutrients that have been mixed from depth all winter long and the increasing light supplied by the late winter sun. The single-celled plants inhabiting these waters, and the small animals that feed upon them, grow rapidly, forming a "bloom," and produce the year's single largest addition or "pulse" to the Gulf's immense food web.

These diminutive forms of life are collectively called the plankton, from the Greek word meaning "to drift." The plant component is called the phytoplankton, "phyto" for plant, while the animals are called the zooplankton, "zoo" for animal. The phytoplankton are almost all microscopic, ranging in size from less than a tenthousandth to perhaps a tenth of an inch, the larger species barely discernible to the naked eye. In each drop of sea water, there may be as many as 100 individual cells; in a thimbleful of water, over 10 million.

These tiny single cells are amazingly diverse in appearance and intricacy. The diatoms, one of the most abundant types, reside in capsules composed of silica, little glass houses with elaborate turrets and pore structures. Some of the most beautiful and strange forms are the algae known as coccolithophores, which armor themselves with elaborate chalk plates during their growth cycle. These plates are shed by the billions into the surrounding sea water and reflect light in a way similar to coral sand stirred up in tropical seas. (The beautiful turquoise water in the tropics is a result of all this suspended chalk and can also be seen in the Gulf of Maine during a coccolithophore bloom.) From space, these blooms look like a splash of white across an otherwise dark blue ocean.

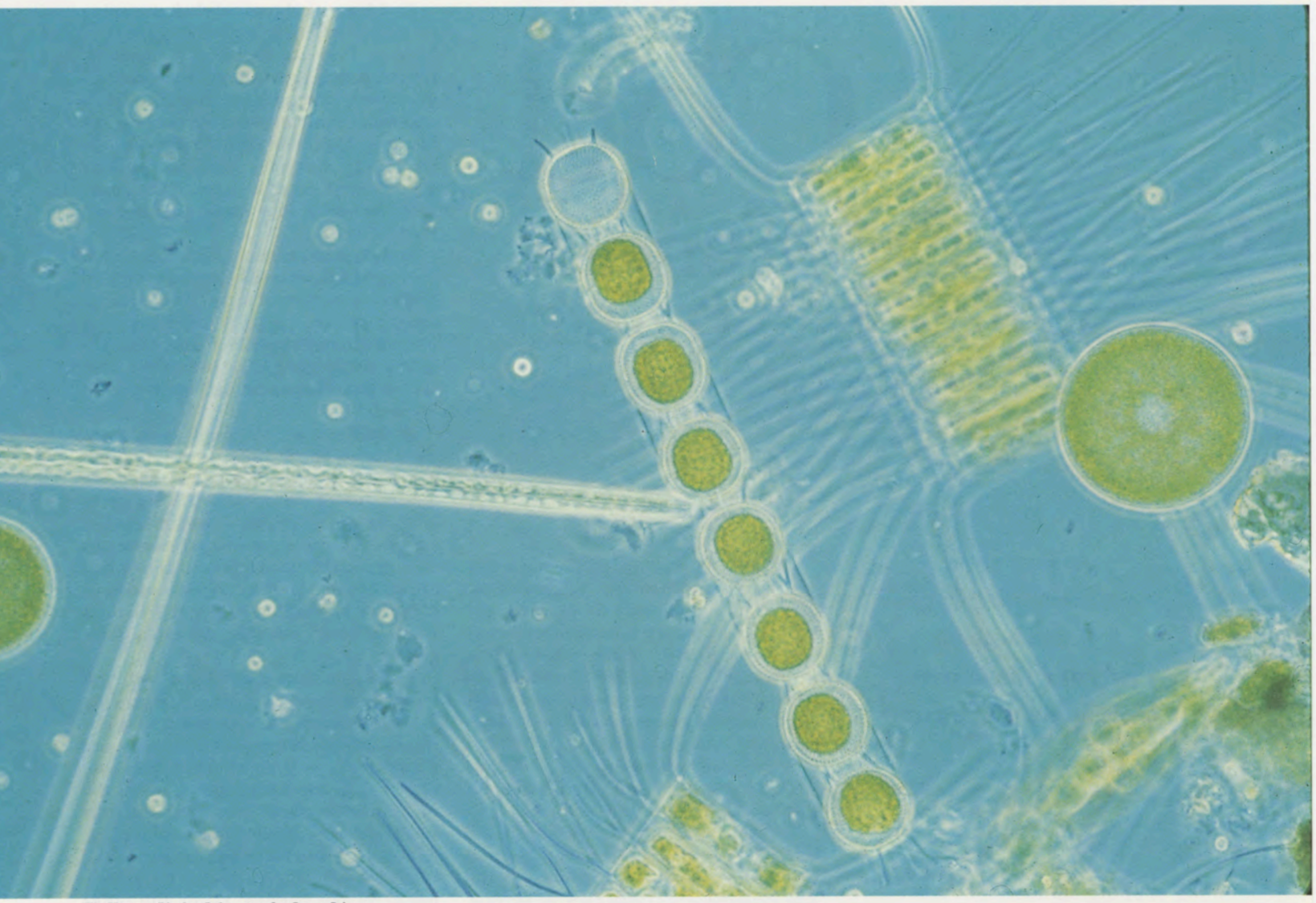
The zooplankton, which mostly resemble rather odd, shrimp-like creatures, are considerably bigger than the phytoplankton, ranging in size from microscopic to perhaps an inch in length. The commercial species of fish and shellfish that are harvested in the Gulf of Maine spend their early life as members of the zooplankton, while other species are permanently adrift.

By definition, the plankton are not masters of their own destiny, but are subject to the force of the tides and currents. In spite of this rather passive lifestyle, these organisms are integral to the fisheries that are so meaningful to us, as well as the very conditions that make our world habitable. The phytoplankton, like all plants, are photosynthetic, harvesting light energy and carbon dioxide to form the simple sugars that are the building blocks of life. Through this process, these tiny plants remove huge quantities of carbon dioxide from the atmosphere and release oxygen at the same time. In the primordial sea, hundreds of millions of years ago, phytoplankton, essentially identical to forms present today, changed our atmosphere forever, producing oxygen and eventually making life possible for organisms such as ourselves.

This process continues today and sustains life on this planet. We can thank photosynthetic organisms, especially those in the surface sunlit layers of the ocean, for delaying the effects of global warming. This phenomenon, caused by the buildup of greenhouse gases such as carbon dioxide in the atmosphere, would be considerably worse if the algae were not at work.

Through photosynthesis, phytoplankton also form the base of the food chain, producing fodder for the zooplankton, which in turn feed larval fish and larger zooplankton such as krill that nourish baleen whales. Like all plants, the phytoplankton need light, carbon dioxide, and nutrients such as nitrogen, phosphorus and trace metals. Because of these requirements, plankton prosper only in certain environments. Light is rapidly extinguished as the water column deepens, so the phytoplankton can only do well where there is suffi-

No one knows how many plankton species there are in the Gulf of Maine, although the number is undoubtedly in the thousands.



Elin Haugen, Bigelow Laboratory for Ocean Sciences

cient light — usually the top 100 feet (30 meters) in coastal waters. If the water is mixed to depths deeper than this critical level, the phytoplankton are carried to depths where they cannot thrive. Since mixing is required to keep essential nutrients in the upper layer, however, a balance between the two factors is achieved.

The Gulf of Maine is so enormously productive because it has an advantageous combination of light and nutrients for phytoplankton growth. At various times of the year, different phytoplankton have adapted to combinations of these factors. Diatoms thrive in the turbulent, nutrient-rich conditions found in the spring and fall, while others, like the dinoflagellates and coccolithophores, do better in warmer, summertime conditions. Zooplankton respond to the increase in phytoplankton, typically grazing down the algae as it peaks, and then declining in population themselves as the food supply ebbs, or as they themselves are eaten by larger predators.

Alexandrium tamarense, a member of the algal class called the dinoflagellates, produces one of the most potent toxins known to man. Dinoflagellates tend to congregate in patches, as they are one of the few plankton that can regulate their position by maneuvering about with the aid of two whip-like appendages called flagella. Reddish in appearance, they often color the water red and are described as "red tide" when abundant. The red tide of *Alexandrium* occurs almost every year along the coast of Maine, where it is readily consumed by shellfish such as mussels and clams. These creatures are not poisoned by the toxin, but concentrate it within their tissues. When the shellfish are harvested and consumed by people, the presence of *Alexandrium* can result in respiratory arrest and death. The State of Maine has a vast monitoring system in place to be sure that the toxin does not go undetected, and large parts of the coast are regularly closed to shellfish harvesting during the summer months when red tide is present.

No one knows how many plankton species there are in the Gulf of Maine, although the number is undoubtedly in the thousands. Many of the most common species are the same as those observed by Henry Bigelow nearly 80 years ago, as he pulled his silken nets behind the schooner GRAMPUS. In the last decade, as new methods of detection have developed, oceanographers have discovered major new forms of microbial life. Some produce chemical compounds that could become the next generation of drugs and pharmaceuticals. We know so little about these ancient forms of life, and yet we rely on them for the seafood we eat, the air we breathe, perhaps the very climate of our earth.

— Maureen D. Keller
Bigelow Laboratory for Ocean Sciences
Boothbay Harbor, Maine

Cod

Connections with other Communities

As they grow, the developing stages of cod become part of a whole series of different communities

Cod have been a major fishery in New England since colonial times. Over the years, fishermen and scientists have tracked the movements of cod, located their major spawning grounds and developed methods to estimate their abundance. Our understanding about how cod fit into the natural world, though incomplete, shows that cod are part of a complex and fascinating biological community.

Adult cod are opportunistic feeders and consume a variety of species ranging from tunicates, sea anemones and hydroids, various mollusks and crustaceans, to herring, redfish and even young cod. Mollusks are the major source of food for cod, with any other species encountered small enough to swallow making up the rest. Cod are notorious for feeding on schools of squid and small fish of any kind.

Most cod reproduce for the first time in the spring of their fourth year when they are about two feet long and five pounds in weight. Cod can grow to impressive size. There are numerous reports of fish being caught that weighed over 100 pounds.

When they were abundant in the Gulf of Maine, large cod could frequently be found feeding close to shore in the fall. As winter approached, they would move into the basins and channels to await the onset of spawning season.

In contrast, smaller, younger adults, while still remaining in the general area, often travel much farther along fairly definite routes to and from their spawning ground. During this nomadic period, some tagged cod have traveled great distances prior to returning.

Cod have synchronized their spawning to coincide with seasonal plankton blooms. They are "broadcast" spawners, releasing their eggs into the water column where they drift until hatching. Copepods and other minute crustacea become the first prey. Successful reproducing depends on the eggs hatching when the plankton are still small enough to eat. If the larvae arrive too early, they starve; too late, and they are eaten.

Rather than releasing their eggs all at once, cod release small quantities over an extended period of time. The survival advantages are clear: by releasing eggs over an extended period of time, some offspring will be more likely to find the right size of plankton to eat and survive. Most will not.

By early spring, cod begin to arrive at their spawning grounds. These are areas with sandy, gravely bottom and often are located near gyres or eddies. A few weeks later, spawning begins — and marks the start of the cod's greatest adventure. As they grow, the developing stages of cod are to become part of a whole series of different communities, for the habitat needs of larvae, juveniles and adults differ greatly.

Tides and currents disperse cod eggs throughout the Gulf of Maine. Depending on temperature, the eggs hatch in a few weeks (about two weeks at 43 degrees Fahrenheit) with an attached yolk sac. After one or two weeks, during which the yolk sac is absorbed, the mouth has fully developed. The larvae commence feeding on copepods and other small crustaceans.

During this period, schools of migrating mackerel and herring, clams and other mollusks, various zooplankton and even larger cod larvae are feeding on the developing cod. Survivors of this stage grow rapidly and soon metamorphose to tiny juveniles and settle to the bottom, where the cod must quickly find shelter. Gravel of a size that allows them to hide is required. If the particles are too large, predators quickly eat them. If too small, they will have no shelter and again they will be eaten. Gravel such as that found beneath gyres and eddies provides high survival rates.

Unlikely as it seems that larvae carried on currents for so long would remain on the same "ground" in significant numbers, those cod that survive to adulthood do return each year to the same spawning area.

Coinciding with metamorphosis and settlement are the appearance of larval stages of barnacles and various mollusks, amphipods and tiny worms, all of which the cod add to their previous diet. At the same time, the cod shares its new habitat

Peter Ralston

with many additional predators. Lobsters, crabs and a multitude of young fish not only compete with cod for shelter and food; those that are large enough also eat them.

Shelter continues to be critical for the juvenile cod. After growing too large for the gravely shelters of the settling area, they move to bordering benthic communities to feed and hide. As they continue to grow, they simultaneously leave one community as they become part of another.

If the necessary critical habitat is located too far away to reach safely, or is too damaged to support them, the young cod will soon starve or be eaten, creating a bottleneck that makes it difficult if not impossible for cod to survive.

Soon the juveniles are big enough to begin foraging over larger areas. With their varied diet, cod are able to find food in most of the habitats surrounding them. But now they must compete for food and space with other young groundfish such as pollock and haddock. Each species spends much of the time over certain bottom types, cod tending to rockier bottom than the others. (Little is known about the relationships with competitors during juvenile stages, but a single pollock of the same size reportedly will send a school of young cod into hiding.)

At this time in their lives, young cod are exposed to larger predators. Year-old pollock devour them in great numbers. Mackerel, sculpin, hakes, flounders, dogfish and even larger cod take their toll during the first year.

By the time the water begins to cool in the fall, the cod have grown to six inches or more and gradually move to deeper water, along with young herring and other groundfish. Having greater tolerance for temperature differences than adults, the juveniles aggregate around the safety of the edges and tops of deeper reefs, with larger fish predictably occupying the deeper soundings.

By winter, the cycle has begun again. Cod, according to their ages, have abandoned their summer haunts for deeper, more comfortable places and now await the beginning of the next year.

— Ted Ames
Stonington, Maine

Benthic Communities

Undisturbed from the Ice Age to the 1980s

Robert Michelson

The vast majority of the bottom of the Gulf of Maine is more than 70 meters below the sea surface. For the most part there is no light at these depths, temperatures are cold (approximately 7 degrees Celsius) all year, and currents are moderately sluggish. In the deepest areas, such as Wilkinson and Jordan basins, the bottom consists of very fine mud and resembles a large, flat plain, while in many other locations, such as near Cashes Ledge, Jeffreys Bank, or Fippennies Ledge, bottom soils are more coarse, often consisting of sands and gravels into which may be mixed small amounts of mud. These various substrates determine the make-up of the animal communities that inhabit the deeper bottoms of the Gulf of Maine.

Contrary to what one might expect, the deep bottom of the Gulf of Maine harbors a great many animal species. Most are small, generally less than a few centimeters in size (referred to as "macrofauna"), and spend their entire lives immersed in the mud, finding there both food and shelter. Marine worms, shrimp-like crustaceans and a few species of clams are the most common forms. There are, however, also some very large species, collectively termed "megafauna." Most of these are beautifully colored animals and include the sponges, sea pens, cerianthid (tube-dwelling) anemones, sea squirts, starfish and brittle stars.

Megafaunal species need solid substrata to which they can attach some part of their body. Thus, they generally live in gravel and boulder bottom-areas rather than the finer muds. In the Gulf of Maine, such bottom types are quite common due to the glacial history of the region. Since most megafaunal species are sessile (permanently attached), their food consists of small organic particles carried suspended in the water. Fortunately, the gravel banks tend to enhance the delivery rate of these food particles by intercepting and accelerating the water flow in much the same way that wind increases in velocity as it passes over the top of a hill.

In areas where the food delivery is sufficient, megafaunal densities can be quite high. At the base of Cashes Ledge, at about 450 feet (150 meters) deep, there is a large "forest" of tube-dwelling anemones. Our surveys indicate that this community may be several kilometers in extent, covering the gravel bank that extends from the edge of the muddy basin to the base of the ledge. In other areas, different megafaunal species may dominate. For example, on Fippennies Ledge, which is mostly a sand bank, myxicolid worms and sea pens are the most common species. Other areas, such as Three-Dory-Ridge, are covered with sponges and colonial invertebrates in the group *Bryozoa* (also called moss animals). Because many of these megafaunal species are large, either in terms of their own body size, or as a result of the tubes they construct, they provide shelter and often food for a wide array of smaller species, thus enhancing the overall biodiversity of the Gulf of Maine.

Since most of the sessile species have no natural predators, it is likely these megafaunal communities have lived undisturbed in the Gulf of Maine for the last 9,000 years (essentially since the Gulf of Maine filled with sea water following the retreat of the glaciers). Unfortunately, during the last decade, some of these communities have been destroyed. Until the mid-1980s, fishermen stayed out of these "rough bottom" areas, but as fish became more and more scarce, rock-hopper, or roller, trawls were developed to allow fish to be taken from the gravel and boulder banks using mobile, rather than long-line, gear. Sponges and bryozoans do not resist well the onslaught of rock-hopper trawls. On Outer Falls, Jeffreys Bank, all the sponges and other large invertebrates have been completely removed, leaving the area looking like the marine equivalent of a forest clearcut. On Fippennies Ledge, in the area where scallop drags have been used, almost all of the myxicolid worms and sea pens are gone.

The deep-water megafaunal areas are some of the most picturesque of the Gulf of Maine's many and diverse habitats. They are, however, still out of the view of most people, scientists included. Because those large animals provide food and shelter for a diversity of other species, they must be protected and allowed to flourish.

— Les Watling
Darling Marine Center
Walpole, Maine

Kelp and urchins

INTERRELATED BY ECOLOGY AND ECONOMICS

Kelp are algae — relatively primitive photosynthetic organisms that are, functionally, plants. The algae that grow on rocky shores in the Gulf of Maine are generally known as red, green or brown. They have no flowers, produce no seeds and use a two-generation process to complete their life cycle. As a group, these plants go back literally billions of years.

Kelp are brown algae of the order *Laminariales*, found worldwide in shallow, cold-water rocky habitats. As a group, they are among the largest and economically most important algae. Maine's kelps grow to exceed 30 feet in length. Different kelps occupy different habitats. They can't stand drying out, and must remain underwater either in tide pools or in the lowest portion of the intertidal zone.

In shallow, wave-beaten environments, kelp forests are too lush for divers to swim through. At greater depths, kelp become less abundant. In regions of clear water they live to depths of 130 feet.

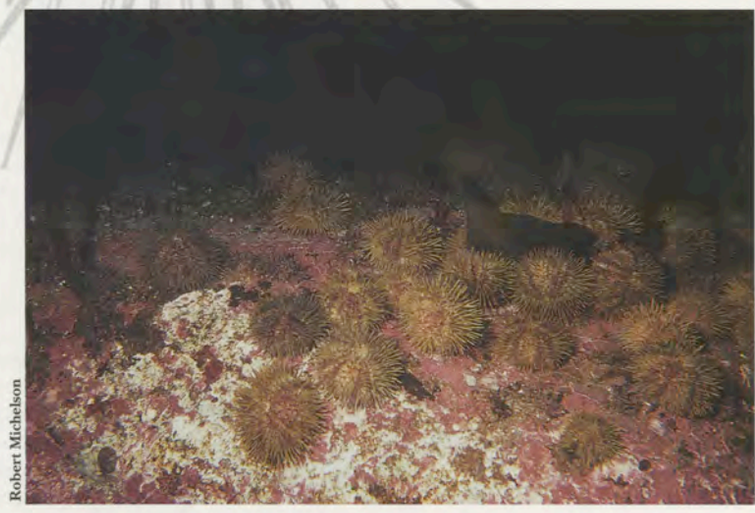
The distribution and abundance of the trees of this undersea "forest" depend on the environment. *Alaria esculenta*, edible kelp, is usually between four and seven feet long with a very delicate narrow blade that tears easily from its outer edge to its midrib. At low tide on a calm day it may lie in a carpet covering a rock. Not very impressive, but if you come back at high tide (with the appropriate dive gear) you will see this kelp undulating with each passing wave.

The horsetail kelp (*Laminaria digitata*) is a tough, leathery kelp that stands up to crashing waves. Beneath the breaker zone, especially on slightly more protected sites, the hollow-stemmed kelp, *Laminaria longicturis*, grows in dense stands. This is the largest of our kelps.

In downeast Maine, this kelp grows over 30 feet long with fronds a yard wide. The hollow stem keeps its blade high in the water where light levels are high. Arguably this is the most abundant kelp in Maine. It is also a favorite food of the green sea urchin, an important player in the lives of Gulf of Maine kelps.

The green sea urchin, *Strongylocentro-tus droebachiensis*, is the most important herbivore in this region's coastal food web. The urchin not only eats algae but it can also change the structure of whole algal communities, removing some species while avoiding others.

Where the green sea urchin is abundant, kelp are rare. Instead of kelp one finds the grazing-resistant, pink calcareous algae called crustose coralline algae. Ledges dominated by sea urchins and these corallines are often referred to as "urchin barrens."



Robert Michelson

At depths of 30 to 70 feet, along with the corallines and urchins, one encounters another kelp species. *Agarum cribrosum* or "sea colander" is relatively small and riddled with naturally occurring holes. Other kelp species get eaten when placed in that environment, but the sea colander protects itself by means of phenolic compounds that are distasteful to the grazers. If urchins are given no choice but to eat this alga, their growth and reproductive capacity suffer.

For decades, coastal communities in Maine were described as having a "zone" pattern. A shallow fringe of kelp abruptly stopped where a feeding front of urchins congregated. The urchins dared not graze any shallower because wave action was likely to break their spines — costly for them, since their growth and reproduction stop as they rebuild their defenses. Sea urchin abundance also decreased with depth, because there was little for them to eat. By all accounts, this marine community was very stable.

In 1987, this picture changed as an international market developed for sea urchins — or more precisely, their roe. By 1994 the urchin harvest in Maine was second only to lobster. But unlike lobster, urchin populations could not sustain the harvest. Seemingly overnight, "urchin barrens" became devoid of urchins. In only a few years, featureless ledges with only corallines became dense kelp beds. Sites that had been observed closely for 20 years looked entirely different.

The community change was profound. Coralline abundance decreased. The limpet that needed expansive coralline cover for its grazing became rare, as did the coralline that depended on that grazing. Places where the distasteful sea colander had thrived became choked with the larger and competitively dominant hollow-stemmed kelp. The featureless coralline community had become a spatially complex kelp forest. Small groundfish such as pollock that use kelp as a nursery ground moved in. Lobsters that avoid featureless ledge could be seen hiding under kelp fronds.

Urchin harvesting provided an example of what happens to a natural system when its principal herbivore is removed, in this case to supply a market on the other side of the planet. The exchange rate of the Japanese yen was such that it paid to hire Mainers to harvest the green sea urchin, even when as little as 10 percent of their volume was usable product (i.e., roe), and to ship it to Japan. Should the U.S. dollar strengthen relative to the yen, it's possible that kelp forests will again disappear and, among other changes, limpet populations will soar. The linkage between ecology and economics is rarely so conspicuous.

— Dr. Robert S. Steneck
Darling Marine Center
Walpole, Maine

Eelgrass

Nutrients and Habitat for a Variety of Organisms

Robert Michelson

Submerged eelgrass is a significant component of the plant life that forms the basis of the marine food chain. It provides essential habitat to myriad organisms, particularly the young of commercially and recreationally important fish.

The role of eelgrass in Maine's marine ecosystem is not well understood, although inferences can be drawn. Along with other flowering plants, macroalgae and phytoplankton, eelgrass fuels the growth and reproduction of detritivores and herbivores who are, in turn, consumed by first order carnivores, and so on up the food chain. Such growth is referred to as "primary productivity." Phytoplankton and macroalgae apparently recycle nutrients at a faster rate than eelgrass, but eelgrass beds can contribute a large portion of the primary productivity in the ecosystems of which they are a part.

Only small amounts of eelgrass are consumed as living plant matter; snails, some birds (such as the brant) and sea urchins consume living eelgrass. The vast majority of the organic matter produced by eelgrass dies and passes through the detrital or decomposition pathway before it reaches higher-level consumers.

Living roots redistribute inorganic nutrients from the sediments to the leaves. Decomposition of dead roots and rhizomes provides a significant and long-term source of organic matter for sediment microorganisms. As a result, eelgrass influences nutrient cycling between sediments and overlying waters.

Eelgrass provides habitat for a wide variety of organisms. The horizontal and vertical complexity of the grass bed itself creates a variety of living spaces resulting in increased densities of both sessile and mobile fauna.

The plants themselves also affect the physical environment. Leaves exert drag forces on the overlying water, reducing velocity and increasing sedimentation of organic and inorganic matter, resulting in reduced turbulence and scouring.

The distribution of eelgrass beds is controlled largely by geomorphology, ambient light and hydrodynamic conditions. The availability of seed may also be a factor, particularly in the colonization of areas without existing beds. Eelgrass requires a substrate that its roots can penetrate and sufficient currents to prevent stagnation but not so great as to cause uprooting. The depth to which eelgrass will grow is a function of light penetration; turbidity will force eelgrass into shallower water or eliminate it altogether. Extremes of water temperature affect eelgrass. It may be nitrogen-limited in some areas, which may explain why beds are occasionally found near the outlets of freshwater marshes.

Eelgrass has annual and perennial forms, both of which yield seeds. The incidence of flowering is related to seasonal temperature extremes. There is some evidence that eelgrass beds can be ephemeral in nature, contributing to oscillations in eelgrass abundance.

Eelgrass provides a nursery for juvenile fish and shellfish, and a feeding area for adults of some species. It also provides protection from predators, a substrate for attachment of sessile stages, and a plentiful food supply. Together, the food and shelter afforded by eelgrass result in a complex and dynamic system that supports various life history stages of organisms that are important both ecologically and to commercial and recreational fisheries.

Tidal range affects the productivity of eelgrass by changing the distance through which the light must pass. Eelgrass in Maine may be less productive, for example, than eelgrass in areas to the south where the tidal range is narrower. On the other hand, higher tides also provide greater flushing; eelgrass beds in Maine may be a source rather than sink for particulate and dissolved organic matter.

Dredging and coastal construction destroy eelgrass. Increased sedimentation due to poor land use practices (and to the deposition of logs, chips and bark during the era of river log drives) smothers eelgrass beds. Nearshore dragging by fishermen may also affect it, and eelgrass in Maine may still be recovering from a die-off that occurred in the 1930s as the result of widespread wasting disease. Although there is little data on which to judge trends in eelgrass abundance along the coast of Maine, it is likely that the above described factors have resulted in a net loss of eelgrass over the last few decades.

Threats to eelgrass beds found today along the coast of Maine include dredging and filling of coastal waters, dragging and other boating activity, modification of normal temperature-salinity regimes, contamination by toxic materials including herbicides, and increased turbidity.

—Anne Hayden
Resource Services
Brunswick, Maine

(condensed from *Eelgrass and Fisheries in the Gulf of Maine*, published by the Island Institute, 1997)

Peter Ralston

Clamming

The Cosmic Context is Critical

The moon is nothing
But a circumambulating aphrodisiac
Divinely subsidized to provoke the world
Into a rising birthrate.
— Christopher Fry

Fry's view is a bit limited; the moon circumambulates, all right, but it has useful purposes other than the one given above, and a lucky thing it is that that is so. For the moon and the sun, working together on the seas, make the art or science of clamming what it is.

Our earth makes an official sidereal daily spin of 23 hours, 56 minutes and about seven seconds (we're slowing down slowly); the moon spins precisely once in an orbit around the earth that takes 27.321666 days. (The single rotation is wonderfully regular; it keeps the moon facing the earth so we can expect to see just the half facing us. But the elliptical orbit, in fact, lets us see 60 percent of the moon, including both its poles, owing to something called latitudinal and longitudinal libration — but that has only a minuscule effect on the clams.)

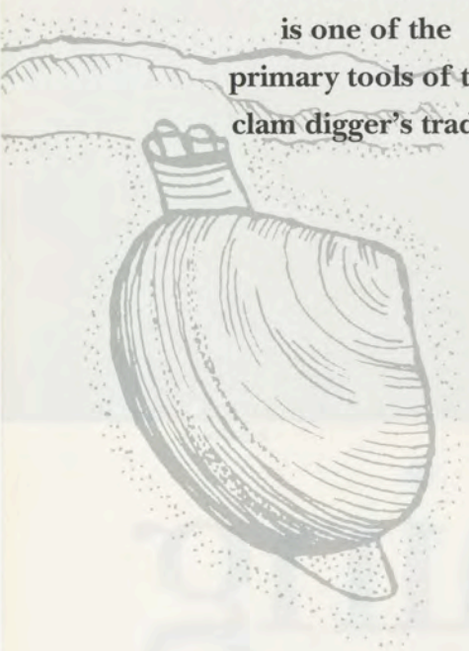
The differences in orbit between earth and moon bring us to that wonderful crossword puzzle word "syzygy," the last word under "S" in the dictionary, with the nifty definition as the point of an orbit at which a planet is in conjunction or opposition with another heavenly body. For the

matter at hand, when the moon, sun and earth are lined up, whether or not the earth is in the middle or the end of the line, the heavenly bodies are in syzygy and there are going to be spring tides.

The tides are in syzygy twice a month, on the full and new moons; the ratio of pull of the moon and of the sun is 11 to five — the sun's mass is 33 million times bigger than the moon's, but the sun is 93 million miles away from the earth, to the moon's 239,000-mile distance. Look at the tide table for Portland in the first ten days of May to learn what all the various motions, masses and mixtures do — it's no wonder that the alarm clock is one of the primary tools of the clam digger's trade.

In the table you'll find a variation of 15 to 46 minutes on the high, and 11 to 36 minutes on the low. That's for starters. If the digger is going to launch his boat at Bath to run down the Kennebec to Parker Head or at Damariscotta for the flats behind Peters Island, the high is an hour later, and there's no sense wasting gas stemming the tide, and he'll be too early anyway.

It's no wonder that the alarm clock is one of the primary tools of the clam digger's trade.



He will note that the tides are building from the neap of the midnight tide beginning May 1 (interval of less than 9 feet) toward the full effect of the new moon on the morning low of May 7 (interval of 12.9 feet), resulting in a 45 percent increase in water flow in about the same tidal time. More important for the clam digger, the drain tide will provide 100 or 200 more yards of accessible flats, depending on their slope. This will affect his choice of flats (if he has a choice) and urge him to get out on the flats early, as he knows he won't be alone. "Three may keep a secret, if two of them are dead," as Benjamin Franklin said 262 years ago, but there are few secrets on the flats in any event, and especially not when the tide tables are available.

He will note also that May 7 and 8 are bonanza days — two daylight low tides in each; sunrise before 5:30 a.m. and sunset nearly 8:00 in the evening, with good drain tides before 7:00 in the mornings and fairly good ones before sunset. If he's got the energy, he'll dig both full tides, catch three or four hours' sleep in the middle of the day, and get back home well after the kids have gone to bed. And if he looks ahead, he can see double-tide bonanzas on three days leading into Memorial Day weekend (although the tides are not as good on that full moon), when the price of clams begins to move. Not to speak of double tides and a new moon on July 3 and 4, and another of the same on Labor Day. The timing hasn't been this good for years.

So much for the simplicity of it. Nowadays there aren't even enough open flats or enough clams to go around. And that makes all the difference in clamming as an industry in 1997. Management is in the hands of the towns, and under the laws and regulations of the Department of Marine Resources. In many areas, towns have joined together to oversee digging, to set restoration goals and stir some hope of reopening closed flats. It isn't easy.

Punching a few numbers in a calculator makes it look good — 707 low tides in a year; dig a mere two bushels on 350 of them at $50 a bushel, and you get $35,000, a 1,400-hour working year at $25 an hour. Maybe better than that if the August price goes to $100. Nothing to it. But no: the Thomaston-Waldoboro-Cushing-St. George-South Thomaston group, from Owls Head around to Friendship, is trying to stabilize a program for 115 licensed diggers with a target of 30,000 annually sustainable bushels, and it has a long way to go. Fifteen committee members have been meeting weekly since January to wrestle with policy and procedures and closed days and limits. The green crabs are not represented on the committee, and they will continue their own policy and procedure, which is to eat their weight in clam seed every day.

The remarkable change is the shift from solitary independence with hoe and hod to getting together with their brother and sister clam diggers, in meetings and volunteer work ashore and on the flats, even to the move of contributing to hire their own warden to watch over them. According to Robert Frost, "The ruling passion in man... is not as he claimed. Grex rather than sex — a gregarious instinct to keep together by minding each other's business." A steamed clam at any season is a lovesome thing, God wot. The community of organizing clam diggers deserves to prevail.

— Ed Myers
Walpole, Maine

Lobsters

They Thrive, but Why?

Robert Michelson

The American lobster, *Homarus americanus*, is one of the largest mobile marine invertebrates in the world. Surprisingly, although it is the most important species to the fisheries of New England and has been intensively harvested for more than a century, it is still abundant. In recent years stocks have increased significantly.

Larvae spend about nine months on mother's tail as she moves them around, trying to find warmer water to shorten her gestation period. Once they are ready to hatch, she fans them away with her paddle-shaped swimmerets. The larvae start off being a little less than one-third of an inch in total length. They float in the water for about a month, surviving by eating much tinier animals floating in the water with them.

Lobsters grow when they molt by shedding and replacing their shells three times as they pass through different stages of development. On their third molt, they take on the body configuration that will have for the rest of their lives. These "post-larvae" are anatomically lobsters, but they are still swimming near the ocean's surface.

In summer, the post-larvae get carried into shallow zones by the prevailing southwesterly breezes. We don't know if larvae recognize when they are in shallow water, but we do know that they dive to the ocean floor and carefully select their nursery habitat. This moment in their life — as they make the transition from being waterborne to living on the bottom — may be the most critical moment they will experience. Settling lobsters seek small, shelter-providing habitats such as cobble beds (fist-size to football-size rocks) where they are safe from predators — small fish such as sculpins, grubbies, rock gunnels and

shannies that attack them primarily at the time they are settling. The average time to first attack by one of these fish is 15 minutes. Lobsters have no time to burrow; they can only hide as soon as possible, and cobble shelters are ready-made foxholes. Lobsters spend the first several years of their lives on the bottom hiding, surviving on the plankton in the water that flows through their shelters. If they can survive their first 24 hours on the bottom, there is a good chance that they will make it to harvestable size.

Lobsters continue to prefer shelter-providing habitats, even though coastal predators large enough to eat them have been gone for decades. Boulder fields are the preferred real estate for larger lobsters. Coastal zones are dominated by juveniles. Lobsters feed at night and are able to follow even the faintest of odor trails in the course of foraging. As dawn approaches, a strange variation of musical chairs is played. Too many lobsters seek too few shelters, and fights break out to see who gets the best hiding spots. This shelter-related combat is surprisingly common and continues all morning long as long as they are not disturbed. (Because lobsters are covered with hairs that are sensitive to pressure waves in the water, a passing diver blowing bubbles cannot observe the combat, which was not obvious to me until I started to use underwater video cameras.)

Some lobsters lose their battles and get displaced. Others may move away, diffusing from regions of high lobster density to areas of lower population. This is called "demographic diffusion." Lobster movement increases after the first year they arrive on the bottom (when they move not much more than a yard in a year), and reproductive lobsters move on average over 30 miles a year. Some wandering lobsters have been observed traveling over 300 miles in a single summer.

As a result, there are areas where large, reproductive lobsters segregate themselves from the rest of the population. Studies have located them in deep water and offshore habitats, even up estuaries. They are found in habitats largely devoid of smaller lobsters.

The segregation of reproductive lobsters may be one reason why stocks have remained so resilient. It is possible that despite the intensive harvest of juvenile lobsters (the barely legal keepers), the reproductive health of the stocks remains good because the broodstock of the population lives in a relative refuge — offshore and in deep water. It is not uncommon to spy lobsters in excess of 20 pounds at depths of 200 meters off Georges Bank. Once, while I was making observations on the distribution and abundance of reproductive lobsters from a U. S. Navy nuclear research submarine, I observed a huge lobster with a carapace of nearly 10 inches. As the 141-foot submarine positioned to photograph the lobster, the lobster assumed a defensive attack posture, appearing to be ready to take on the nuclear sub. That's aggressive!

Today there is growing concern about the safety of these broodstock lobsters. As other fisheries collapse, more and more effort goes into catching lobster, and in recent years, large ships from New Hampshire have steamed to downeast Maine to harvest jumbo lobsters which can be legally landed in New Hampshire. Maine lobstermen and a growing number of managers have begun to call for a regional prohibition against landing oversized lobsters.

As other fisheries collapse, more and more effort goes into catching lobster.

Of course, lobster populations haven't crashed under intensive fishing pressure — they have significantly increased! There has been much speculation concerning the reasons for the increase. Is it due to the loss of predators? Unlikely, since coastal predators such as codfish have been functionally absent for some time. Are environmental conditions favorable to settling lobster post-larvae? Stocks have increased throughout the western North Atlantic, from the Gulf of St. Lawrence to Long Island Sound. Many scientists suspect the increases relate more to the environment than to management action taken by people.

Will lobster stocks crash? Fishermen have expressed concern over the growing intensity of harvesting effort. Some feel that while stocks are relatively healthy, the escalating number of traps and new harvesters is putting this resource on the same disastrous course as other fisheries that have already collapsed. In the meantime, lobster researchers are working to develop predictive capabilities so that if significant stock declines are about to occur, scientists and harvesters will see them coming seven or more years before they affect the fishery.

This species has several unique attributes that allow it to persist where others fail. Using lobster traps as the primary method of harvesting means undersized, oversized and egg-bearing lobsters can be gently returned to the sea to grow or to remain safe from the industry. If more species could be harvested in such a low-impact manner, they might have the sustainability of lobsters.

—Dr. Robert Steneck
Darling Marine Center
Walpole, Maine

All photographs courtesy of James M. Acheson

HORATIO CRIE
and the Lobster Double-Gauge Law

One man's charisma and common sense compelled Mainers to adopt a radical conservation law in 1934

JAMES M. ACHESON

Most of the world's major fisheries are in a state of crisis. The Maine lobster industry is very unusual in that it has come back from the brink of extinction to become one of the most highly productive fisheries in the world. Between World War I and World War II, lobster catches had fallen to five to seven million pounds — so disastrously low that hundreds of lobster fishermen were forced from the industry. By 1994, catches had increased 800 percent to 40 million pounds of lobster, valued at over $100 million. Even more remarkable for experienced observers of fisheries is the fact that despite heavy fishing pressure, the lobster catch has remained relatively stable since 1947. Maine lobster is truly the "comeback kid" of major fisheries.

This remarkable turnaround is due in no small degree to the efforts of Horatio Crie, who led the Maine Sea and Shore Fisheries Commission from 1918 to 1935. It was Crie who was able to get enough support in the industry and the Legislature to pass the "double-gauge law," a controversial measure protecting both juvenile and large breeding size lobsters; it had been proposed 40 years earlier. Shortly after this law went into effect in 1934, catches began to improve and the upward trend has continued to this day.

Decades later, conservation efforts were enhanced by the passage of other laws, but the double-gauge law marked the turnaround for the lobster industry. It remains the backbone of conservation efforts to this day. No less important, Crie had enough support to begin vigorous enforcement of conservation laws and still keep his job. In an era when virtually all major fisheries in the world are in decline, the significance of Horatio Crie's accomplishments extends far beyond Maine.

Crie was no stranger to the Maine fishing scene. He was born on the island of Criehaven in 1870, the son of Robert Crie, who owned the island and a fishing station. Horatio began lobstering at the age of seven. After graduation from Castine Normal School, he returned to Criehaven and became postmaster in 1897. According to his cousin Ernest Crie of Rockland, sometime before 1912 he moved to Rockland, where he became involved in the sardine business and local politics.

In 1918, he was appointed one of three members of the Sea and Shore Fisheries Commission. One year later, lobster catches declined sharply, and they remained at record low levels until World War II. In 1920, Crie became director of the commission, a job he held until 1931. From 1931 to 1935, he was commissioner of the newly created Department of Sea and Shore Fisheries, at a time when the lobster fishery was truly in desperate condition. Crie was to preside over the state fishery bureaucracy during the worst years the lobster industry had ever experienced. Fortunately, he was equal to the challenge.

The problems facing Crie in the 1930s had a long history. The commercial lobster industry began in the 1840s with the establishment of canning factories along the coast, and the invention of the lobster smack (a sloop with a circulating sea-water tank), which made it possible to ship live lobsters to the cities along the eastern coast of the United States. The practices of the canners were very destructive. They canned small lobsters and females with eggs. A high percentage of lobsters died before they could be cooked, and were wasted.

In the early 1870s, there was general agreement that the industry was not what it had been, and the first laws were passed making it illegal to take females with eggs and lobsters under 10.5 inches. By 1890, declining catches and stricter laws forced the last of the canners from Maine.

Conditions still did not improve. In 1901, John Cobb wrote of the lobster industry that "the steady decline from year to year has caused the gravest fears." In the same year, Holman Day wrote a poem entitled "Good-bye, lobster." Many knowledgeable observers of the industry thought additional regulations were needed over and above the 10.5-inch minimum size limit and the prohibition against catching gravid females. As early as 1902, biologist George Field advocated solving the problems of the industry by protecting older and more prolific lobsters. Dr. Francis Herrick, the dean of lobster biologists and a man who had been studying the subject since the 1880s, strongly favored a maximum size limit reasoning that some lobsters do not begin to extrude eggs until they are 12 inches long. However, large numbers of people in the fishing industry wanted a fairly small legal minimum size, which would allow them to catch "dinner" lobsters that could be sold at a reasonable price. Protecting large lobsters with a large minimum size measure, in their view, not only would cut their catches drastically, but would result in lobsters being so costly that Maine would be priced out of the national and international markets. In fact, many in the lobster industry thought the existing 10.5-inch minimum was too high. They agitated against this law continually, calling it the "poverty gauge" because in their view, it forced them to throw out most of the lobster they caught along with their possible profit.

In the late nineteenth and early twentieth centuries, it was common for people to take home "short" lobsters to feed the family.

Dr. Herrick proposed a compromise solution: a double-gauge law specifying both a minimum size to protect small lobsters and a maximum size to protect larger, proven breeding stock. He originally thought the minimum should be nine inches and the maximum 11 inches.

In the face of such controversy, the legislature waffled. They did little in the first years of the twentieth century beyond changing the way that legal lobster were measured. Rather than being 10.5 inches measured from tip to tail, a legal lobster had to be 4.75 inches measured from the tip of the nose bone (rostrum) to the back of the body — no change in the size limit at all, since both measurements produce a lobster of 3.65 inches measured on the carapace.

In 1915, conditions in the industry were serious enough that the legislature appointed a commission to study lobster legislation. The star witness was Francis Herrick, Ph.D., D.Sc., who again advocated the double-gauge law. He strongly urged the commission to recommend such a bill for the long-term welfare of the industry and the people of the state of Maine, even though he knew it would prove unpopular with some segments of industry in the short run.

The commission did recommend passage of the double-gauge. But after the members of the legislature from coastal counties talked with their constituents, no bill favoring the double-gauge was sent to the floor of the legislature. Some members of the industry objected to lowering the minimum length to nine inches (tip of the rostrum to end of the tail) since this was favored by the suspect "dealers"; others did not want a maximum length on the grounds that it would make it illegal to take large lobsters. To read some of the testimony in the legislative record, one would think that the lifeblood of the industry was lobsters 13 inches overall length and larger. Thus the 3.65 (measured on the carapace) -inch minimum law remained in effect until 1919, when industry agitation prompted the Legislature to change the law to 3.5 inches.

Biologist Herrick was openly critical. He said existing legislation was "unscientific," "defective" and "bound to fail." He continued to recommend the double-gauge law, but got nowhere.

Fishermen thought the conservation laws were foolish and designed to make it impossible for them to make a living. They violated them en masse. In the late nineteenth and early twentieth centuries, it was common for people to take home "short" lobsters to feed the family. A very large number of fishermen and dealers were involved in the lively and remunerative short-lobster trade, which shipped untold amounts of illegal lobsters out of state. Worse, many men scrubbed the eggs off egg-bearing females and sold them. In 1887, Rathbun spoke of the "wholesale slaughter of females with eggs, which has always been going on." Some fishermen also made a practice of smashing up short lobsters caught in their traps to serve as bait.

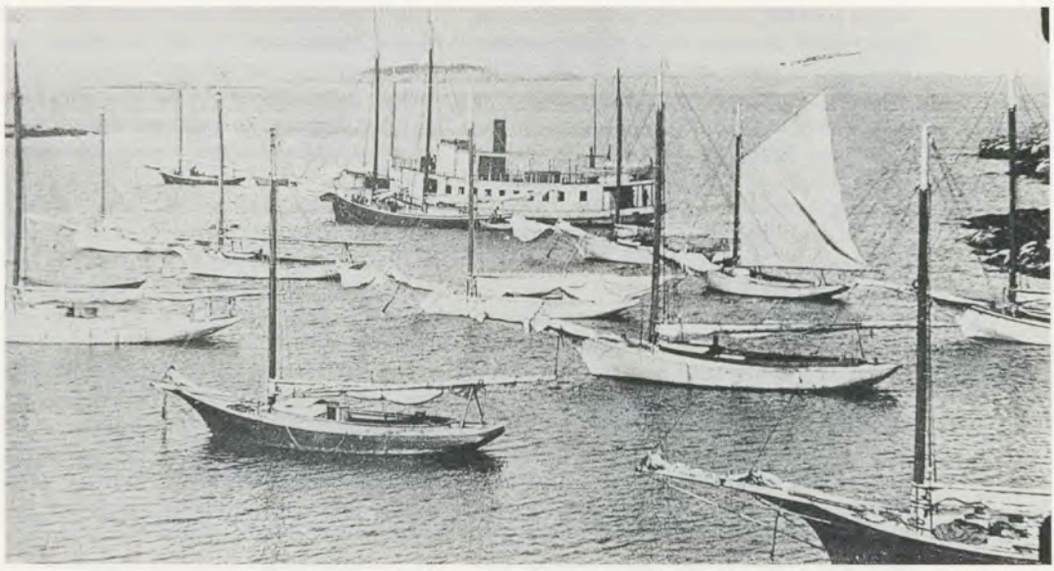
Strangely enough, throughout the 1920s, the pitifully poor catches produced no calls for remedial legislation. Commissioner Crie spent much of his time on law enforcement. The correspondence of the commissioner in the Maine State Archives is filled with reports from wardens, judges and fishermen about violations of the laws and court cases. In the early 1920s, violations of the lobster con-

servation laws were so severe that Crie closed the entire lobster fishery along the central coast. Members of the fishing industry managed to apply enough political pressure in Augusta, the state capital, to have the fishery reopened in a week. But the fact that Crie, who was known as a friend of the industry, felt obliged to resort to such drastic actions indicates how seriously he regarded the widespread violation of the laws.

Attitudes towards law enforcement were changing, and Crie's efforts to put teeth in the conservation laws did not make him suspect or hated in the industry as a whole. Many fishermen began to feel that the law breakers were doing no one any favors. Crie began to receive many letters reporting violations. Leonard Brewer from Boothbay Harbor told Crie that if he would send a warden, "I will do all I can to help catch Archie Keller. He is buying short lobsters from the fishermen.... He is a proper crook."

Commissioner Crie also ran the department in a way that made a lot of friends. He defended the interests of the industry whenever possible. He cut red tape for fishermen when he could. He was tough on people who violated the law repeatedly, but was more lenient if he thought that was warranted. He was a genial person, and that helped. Joan Johnson, his granddaughter, recalls him as "the kindest man that ever lived." He was a great storyteller. One colleague, who spent an evening with him at the Willard Hotel in Washington, D.C., wrote that "I have never laughed so hard in my life." Fishermen began to write him for advice on personal matters. By the end of the 1920s, he was the acknowledged leader of the fishing industry, with a following up and down the coast. He was to put that political following to good use.

If the 1920s were bad for the lobster industry, the 1930s were much worse.



Once the Depression began, prices for lobster fell even though catches were very low. Vernon Gould wrote the commissioner, "Lobsters are very scarce and the price so low that together with the weather a fisherman can't earn enough for his living not to mention keeping up their gear." Llewelyn Crowley wrote, "The way the situations are now we cannot earn a living. I have known the best of fishermen to go out here this winter and haul a hundred traps or more and get only nineteen to twenty pounds of lobsters, and I for one only get from six to thirteen pounds."
The disastrous conditions continued for years. In 1933, Commissioner Crie wrote, "Conditions have never been more serious in the lobster industry of Maine than they are to-day. The fishermen and dealers alike are hit so hard that they hardly know how to turn in order to make a living for themselves and their families."

Large numbers of fishermen left the lobster industry, despite the fact that all industries in coastal Maine were in serious difficulty. In 1928, there were 3,806 licenses issued in the lobster fishery; by 1933, there were 2,587, a decline of 32 percent in four years.

What was the cause of the disaster? The fishermen focused on the low price of lobster, for which they blamed Canadian imports. Some of the wardens blamed the fishermen, a large number of whom were violating the conservation laws. But some of the biologists saw another problem — namely, that the minimum size law made it legal to take only the large, breeding-sized lobsters.

Several strategies were tried to alleviate the problems in the lobstering industry. Horatio Crie played a key role in all that followed. Crie first began an advertising campaign in which he urged the public to "remember the fisherman and have two lobster days a week." In a series of articles and letters to newspapers, he pushed hard for a duty on imports. His efforts struck a responsive cord in the lobster industry. One newspaper editor write to Crie, "Your statement in regard to a duty on Canadian lobsters was good and to my mind is the only remedy to help the fishermen of this coast at the present time."

With Crie's strong urging, U.S. Senator Wallace White and two of Maine's then-three congressmen, Representatives Nelson and Moran, introduced three bills into the Congress in 1932 to impose a tariff on Canadian lobsters or prohibit the importation of lobsters or lobster meat into the United States. None of these efforts succeeded. The Congress and President Franklin D. Roosevelt were interested in far larger issues.

When protectionism failed, efforts to change the size laws began in earnest. The hotel industry wanted smaller and cheaper lobsters; many of the dealers saw a small gauge as producing lobsters that could compete all over the United States and Canada. In general, fishermen from the southernmost counties favored reducing the legal minimum to nine inches (tip

The Great Lobster Bust, 1920-1940

The fortunes of the lobster industry have varied considerably during the twentieth century. But from 1947 until the present, lobster catches have been remarkably stable, averaging about 20 million pounds per year. Since 1990, the lobster industry has had unprecedented success. Lobster catches have been close to 40 million pounds per year, record high levels not seen since the 1880s. In 1995, the Maine lobster catch was valued at over $100 million, making it one of the world's most valuable fisheries.

However, the interwar years were a time of economic disaster for the Maine lobster industry. In 1919, lobster catches declined precipitously and remained low until the middle of World War II. Throughout the lobster "bust" of the 1920s and 1930s the total Maine catch hovered between 5.5 and 7.1 million pounds. Fishermen sometimes caught less than 20 pounds of lobster per day. Even worse, the few lobsters they did catch were worth little. In 1933, the very depth of the Depression, ex-vessel prices averaged about 18 cents per pound.

During these years, a large number of lobster fishermen went out of business. In 1928, 3,806 licenses were issued; in 1933, 2,587 — a 32 percent decline in four years.

There is no consensus on the cause of the "lobster bust." Some experienced observers of the industry believe that stocks were low due to a combination of low water temperature, which affected larval settlement, and massive violations of the conservation laws, which reduced the size of the broodstock. In addition, it is possible that increased predation by large stocks of cod and haddock on small lobsters may have also played a role in reducing the population.

—J.M.A.

of the rostrum to the end of the tail) since this would increase their market in the local tourist trade and make it possible to sell legally to neighboring Massachusetts and New Hampshire. Still, most of the fishermen along the coast did not favor a small gauge since they believed it was nothing more than a ploy by the dealers to import large amounts of small Canadian lobsters and undercut the price Maine fishermen received.

Commissioner Crie was not in favor of lowering the minimum size to nine inches, believing this would not conserve the breeding stock and would ultimately lead to the demise of the industry. He steadfastly favored the double-gauge law, which he saw as a compromise that had something for all factions. He pointed out that the double-gauge would protect small lobsters and conserve the large, prolific lobsters. It would also allow Maine fishermen to catch smaller lobsters, which would enable them to compete more effectively for markets served by Massachusetts and the Canadian provinces. It would also, he argued, keep out 40 percent of the Canadian lobsters that were currently flooding the American market. In short, Crie argued, the measure would be good both for conservation and for sales. Crie stated his support for a double-gauge law with a nine-inch overall minimum and 13-inch maximum in all of the coastal newspapers. He also sent an explanation for his position to fishermen and the Maine congressional delegation.

A meeting was held in Augusta in January, 1933, to discuss the double-gauge proposal. It had some support among dealers and people from the westernmost counties, but the majority of the people present were against any change in the law. Crie then sent out a questionnaire to all lobstermen; the returned cards revealed that the industry was badly split on the issue. University of Maine historian Richard Judd reports that "1,166 respondents favored the double-gauge law, and 1,068 were satisfied with the existing limit." In general, the fishermen in the western counties favored the small, nine-inch minimum; men in the eastern counties wanted the existing, ten-and-a-half inch minimum. Many of the dealers were in favor of the double-gauge since they wanted smaller lobsters, and the "jumbo" lobsters found a poor market, anyway.

Crie then sent out his wardens armed with petitions in an attempt to drum up support. They had little success in getting signatures. Warden C. S. Beale wrote the commissioner, "I have carried your petition around until it is almost wore out, but could not seem to get the men to sign it."

Commissioner Crie, long known as a friend of the industry, came under serious criticism. Some groups of fishermen were convinced he had sold out to the dealers and "nine inch" advocates. The correspondence reveals a good deal of bitterness and frustration on all sides.

In March 1933, the issue came to a vote in the legislature. A bill to reduce the minimum size from ten and a half to nine inches failed. Efforts by Senator McLoon of Knox County "to promote the double-gauge as a compromise" were voted down as well.

In December, 1933, the Maine Legislature met in special session to deal with a number of issues concerning the deepening economic crisis. One of the industries that claimed its attention was the lobster industry. Another double-gauge bill was proposed as the solution to the problems of the industry, and Commissioner Crie was asked to comment on the merits of this bill on December 11, 1933. He spoke forcefully about the need to preserve the industry by protecting the large reproductive animals. He promised, "If a double-gauge measure is passed . . . you will see the lobsters continue to increase from year to year and no one will ever have to feel disturbed about the depletion of the lobsters on the Maine Coast so long as a double-gauge measure is enforced." (This proved to be a very astute prediction.)

Even though there was a great deal of uncertainty and disagreement in both the industry and legislature, the views of Crie and the proponents of the double-gauge measure were to prevail. Without much press attention or public debate, the Maine Legislature narrowly passed the bill providing for a 3 1/16-inch minimum and a 4.5-inch maximum. Its passage gave Maine the only double-gauge law in the world. It was truly a radical piece of legislation, and remains the foundation of lobster conservation efforts in Maine to this day.

Some fishermen were very pleased by the passage of the double-gauge measure. Thirty-three fishermen from Bucks Harbor went on record as favoring it. Others were decidedly unhappy. William Colson spoke for the latter group when he wrote that the double-gauge law has been "an awfull mistake." He predicted that "if the double-gauge is not changed and changed quick, our lobster fishing will be all over with in less than a year."

The opponents of the new law decided to try to have it overturned by a referendum, and they proceeded to pass around petitions. The court decided that they had not obtained enough signatures to have it put on the ballot.

The double-gauge law was the product of an unusual time. In the face of economic catastrophe, the mood of the industry and the Maine Legislature was somber enough to contemplate radical solutions. Commissioner Crie, a masterful politician with a lot of support, was able to take advantage of the situation to press for the double-gauge law. The industry strongly supported measures to limit the supply of Canadian lobsters coming into the country. When this tactic failed, they had nothing else to recommend on which there was general agreement. The double-gauge law had first been suggested by biologists Field and Herrick in the late nineteenth and early twentieth centuries, but it was Horatio Crie who interested key legislators in it and lobbied effectively for its passage.

No important piece of legislation is the product of one person, but the passage of the double-gauge law in Maine demonstrates what one charismatic, stubborn and hardworking person can do to influence legislation in a time of crisis. In a time when the industry was badly split, Crie's efforts made the difference.

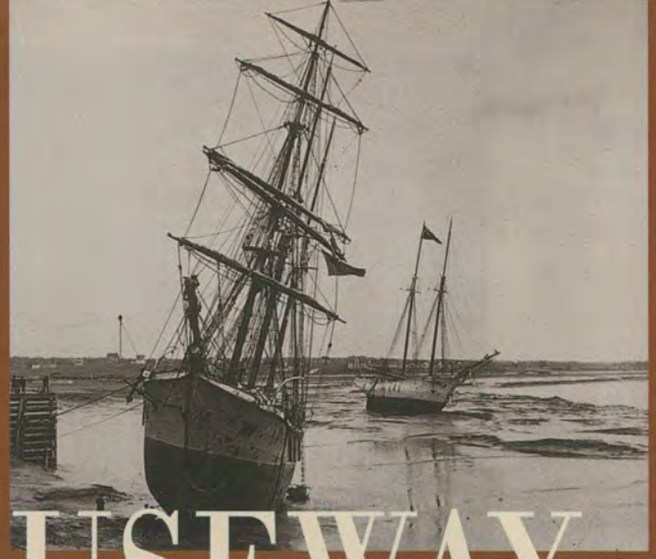
Since 1934, the lobster industry's interest in conservation has continued to grow, and has resulted in the passage of a number of laws. The most important of these was the 1948 "V-notch" law, which allows fishermen to cut a notch in the tail of any female with eggs. Such V-notched lobsters may never be taken. There are untold thousands of "oversize" lobsters (protected by the double-gauge) and "V-notched" lobsters in Maine waters. Most fishermen believe these laws are effective in protecting the breeding stock. One fisherman told me, "If you do away with those laws, you do away with the industry. It is that simple."

Commissioner Crie had to work hard to pass the double-gauge law in 1933; today, one would have to work hard to abolish it. A fisherman who is known to take oversize or "V-notched" lobsters will not only have trouble with the wardens, he will have serious problems with other fishermen.

But a recent development does threaten Horatio Crie's legacy. Large vessels from New Hampshire are placing hundreds of traps in waters just beyond the three-mile line marking the limit of Maine's jurisdiction. They are taking large numbers of oversize lobsters preserved by Maine's double-gauge law and landing them in New Hampshire. Although this activity is completely legal, Maine's lobster fishermen are justifiably outraged. What they will do to preserve these oversize lobsters is not yet clear, but the double-gauge measure has enough support so we can confidently predict they will do something.

People in the lobster industry believe the double-gauge law and the "V-notch" program are effective because they preserve the most basic biological function — reproductive potential — by directly protecting the breeding stock. This approach to management appears to be more effective than cutting fishing effort through catch quotas, now the favorite tool of fisheries managers in other fisheries. Agencies wishing to manage other stocks in other areas of the world might learn a good deal from the experience of the Maine lobster industry and its hero, Horatio Crie.

James M. Acheson *teaches in the Department of Anthropology at the University of Maine. He is author of* Lobster Gangs of Maine.



Rock-filled cribs at the wharves in Moncton, New Brunswick, were built to support the ships when the tide fell, and indicate the height of tides. The cribs are now completely submerged in mud

A Causeway Chokes a River

Gulf of Maine Estuary Restoration Project

Plugged 30 years ago by an ill-conceived causeway, the Petitcodiac River at Moncton, New Brunswick, exemplifies what has happened to prime wetlands throughout the Gulf of Maine region.

Since European settlement, four-fifths of the vast salt marshes in the upper Bay of Fundy have been lost to agriculture and development. Most of the rivers that empty into the Gulf of Maine have been dammed, choking off fish spawning runs and reducing marine productivity. Eelgrass beds have been in decline since the 1940s. As each of these systems become degraded, the overall productivity and ecological integrity of the Gulf of Maine ecosystem is compromised.

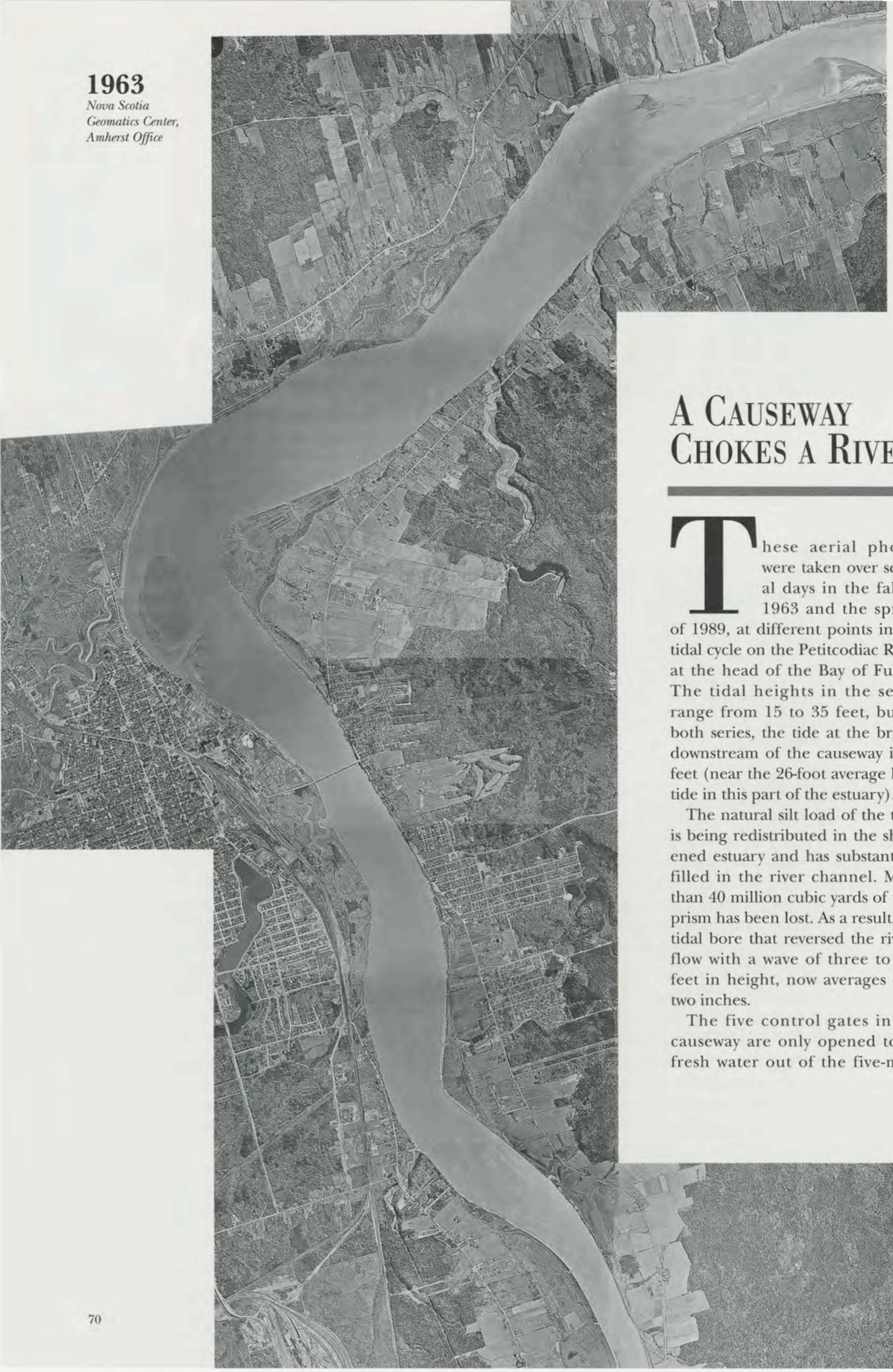
The Gulf of Maine Estuary Restoration Project, a joint effort of the Conservation Law Foundation of Boston, MA, the Conservation Council of New Brunswick and the Island Institute, is assessing the health of estuaries in several areas of the Gulf of Maine.

Using remote sensing and Geographic Information Systems (GIS) technologies, a study team will examine the Petitcodiac and other systems over the next two years. It will determine how such technologies can help local, citizen-based initiatives like Friends of the Petitcodiac restore estuary habitat, and then develop a conservation blueprint and action plan to restore and protect it.

The Gulf of Maine Estuary Restoration Project is part of a larger estuary restoration program in the United States called Restore America's Estuaries (RAE), an alliance of eight regional groups undertaking similar work in the Chesapeake Bay, Puget Sound, Narragansett Bay, San Francisco Bay, and the Hudson-Raritan Estuary in New Jersey. Funded in part by The Pew Charitable Trusts, the goal of RAE is to restore 1,000 acres of estuarine habitat by the year 2010. The Gulf of Maine Estuary Restoration Project is the only RAE member whose program and partners span two countries.

— Annette S. Naegel
Island Institute

1963
Nova Scotia Geomatics Center, Amherst Office



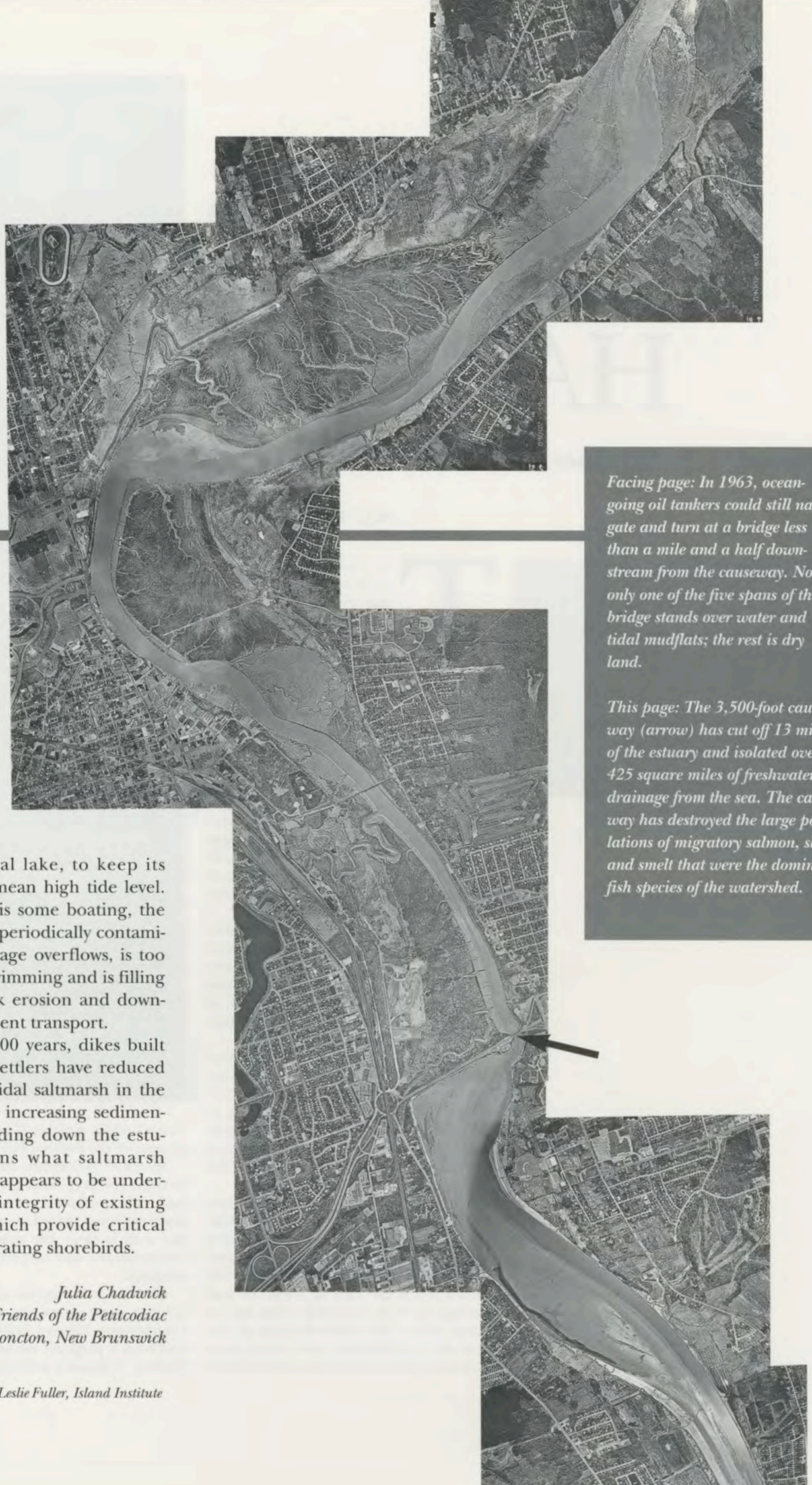
A Causeway Chokes a River

These aerial photos were taken over several days in the fall of 1963 and the spring of 1989, at different points in the tidal cycle on the Petitcodiac River, at the head of the Bay of Fundy. The tidal heights in the series range from 15 to 35 feet, but in both series, the tide at the bridge downstream of the causeway is 24 feet (near the 26-foot average high tide in this part of the estuary).

The natural silt load of the tides is being redistributed in the shortened estuary and has substantially filled in the river channel. More than 40 million cubic yards of tidal prism has been lost. As a result, the tidal bore that reversed the river's flow with a wave of three to five feet in height, now averages only two inches.

The five control gates in the causeway are only opened to let fresh water out of the five-mile-

1989
New Brunswick Geographic Information Corporation, Moncton Office



Facing page: In 1963, ocean-going oil tankers could still navigate and turn at a bridge less than a mile and a half downstream from the causeway. Now only one of the five spans of this bridge stands over water and tidal mudflats; the rest is dry land.

This page: The 3,500-foot causeway (arrow) has cut off 13 miles of the estuary and isolated over 425 square miles of freshwater drainage from the sea. The causeway has destroyed the large populations of migratory salmon, shad and smelt that were the dominant fish species of the watershed.

long artificial lake, to keep its level at the mean high tide level. While there is some boating, the headpond is periodically contaminated by sewage overflows, is too muddy for swimming and is filling in from bank erosion and downstream sediment transport.

For over 200 years, dikes built by Acadian settlers have reduced the area of tidal saltmarsh in the estuary. Now increasing sedimentation extending down the estuary threatens what saltmarsh remains and appears to be undermining the integrity of existing mudflats, which provide critical food for migrating shorebirds.

Julia Chadwick
Friends of the Petitcodiac
Moncton, New Brunswick

Aerial mosaic by Leslie Fuller, Island Institute

BOSTON'S CLEANER HARBOR

A billion bucks later, the fish are back

BILL SARGENT

Boston was having effects on the marine environment two centuries ago.

Frank Siteman

THE CHARLESTOWN BRIDGE in Boston may seem an unlikely site for water quality testing. It shakes and rattles with rush hour traffic; horns honk, adrenaline pumps and a varied assortment of obscenities and hand gestures fly through the crisp morning air. Yet the bridge also provides this displaced Cape Codder with a momentary respite from the city.

I cross over the pedestrian sidewalk every day before work. Seagulls glide gracefully beneath me and cormorants emit prodigious quantities of excrement from their perches on a cluster of jagged pilings that jut out of the water at odd angles. The pilings are the only remains of a pier that burned several years ago, under suspicious circumstances.

The muddy green waters of the Charles River spew out of floodgate locks to mix with the swirling tidal waters of the Boston's Inner Harbor. Rotting piers and moored police boats sit idly on one side of the bridge, a swanky marina and the stately CONSTITUTION float on the other.

A collection of homeless gentlemen have their simple campground on a grassy bank near the confluence of the two bodies of water. They gather every evening to watch the sunset, enjoy a bottle of wine and feel superior to the yuppies battling traffic overhead. It is a restful, peaceful place.

It only gradually dawned on me that my daily strolls across the Charlestown Bridge could also provide a visual gauge of the cleanup of Boston Harbor. The first time it hit me was on a cold snowy day in 1994 when I spied the face of a harbor seal peering up at me curiously from the icy waters below. He reminded me of the scene in *It's a Wonderful Life* in which snow swirls and Clarence thrashes in ice-choked waters while urging George Bailey to plunge off the Bedford Falls bridge.

My fellow pedestrians found my allusion strange, judging from their incredulous looks and quickened pace. But the homeless gentlemen shared my enthusiasm and the seals became the subject of excited conversations and conjecture for several evenings.

After an evening lecture a few weeks later a man came up to me in the Charlestown Library and swore that he had seen a porpoise swimming in Boston Harbor. I listened politely, assuming all

the while that he was just another misinformed urbanite who had undoubtedly mistaken a harbor seal for a harbor porpoise.

The next week it was my turn to be incredulous. I was taking the Charlestown Water Taxi from the Naval Pier to the New England Aquarium and there, swimming beside me, was undoubtedly a harbor porpoise. My fellow passengers found my enthusiasm, once again, eccentric.

The crowning moment came with the spring. I started to see silvery glints and flashes below the surface of the water.

Bill Sargent

Bill Sargent

A new outfall pipe will empty into the ocean nine miles offshore.

Holding a gun to your opponent's head often works in Boston politics.

They looked remarkably like the telltale signs of alewives. Of course, it was a likely spot, where the fresh waters of the Charles mix with the salty tidal waters of the harbor. But Boston Harbor? Alewives? I couldn't be sure and I had stopped pointing out my observations to fellow pedestrians.

Yet day after day I noticed the silvery, provocative flashes. Something was making them. The clincher came in early May. A fisherman appeared on the bridge. Finally, a fellow enthusiast. With mutual appreciation we admired his technique. He cast out a heavy snag hook and reeled it home with a series of wide sweeps. The treble hook caught the current spewing from beneath the locks.

Suddenly one of the hooks snagged a fish. Indeed it was an alewife. The hapless fish fluttered to the surface vainly trying to dislodge the hook. To no avail, the heavy hook held. The alewife gave up.

Yet all at once the alewife seemed to regain life. She flipped upright and drove straight toward the bottom. The fisherman's rod bent double. What was this? A six-inch alewife shouldn't have so much strength. A second later the realization hit. The fisherman had snagged a striped bass, a keeper at that, and only a hundred yards from the parquet floor of the old Boston Garden!

Striped bass, alewives, lobsters, menhaden, clams and bluefish — these were the reason that Governor Winthrop convinced the early colonists to settle on Boston Harbor. The confluence of the Charles, the Mystic and the Neponset rivers made this one of the most productive estuaries on the East Coast. Hundreds of acres of marshes and clam flats provided an abundant supply of easily obtainable food.

Almost instantly the colonists started to destroy the very things that had attracted them to this spot in the first place.

Of course, Boston was not alone. Most cities are built on the world's most naturally productive food areas. Rather than preserving such productive places we seem hell-bent on destroying them.

The fact that Bostonians can still catch keeper striped bass in the heart of the city is far more a testament to the resilience of nature than the foresight of mankind. However, Boston is trying to redress the centuries of abuse and to almost everyone's surprise — it's working.

Boston has a long and distinguished tradition of dumping on and dumping in its harbor. The tradition stretches back at least as far as the Boston Tea Party and as far ahead as George Bush. In his 1988 campaign, the wily Republican cruised through Boston Harbor proclaiming it "The dirtiest harbor in the nation." Of course, he put all the blame on his rival Michael Dukakis, the governor of Massachusetts.

Actually, by 1988, Massachusetts was finally on its way to cleaning up Boston Harbor. It had not been easy. A city worker in Quincy, Bill Golden, started the ball rolling by suing the state and federal government after almost stepping in human excrement on his morning jog on Wollaston Beach. The Conservation Law Foundation added its legal muscle.

Paul Garrity, a flamboyant federal judge, picked up the ball next. He stopped all development in Boston, forbidding anyone to hook into the sewer system until the Massachusetts legislature created a state body to clean up Boston Harbor.

Holding a gun to your opponent's head often works in Boston politics. Irate builders swarmed through the State House, buttonholing their representatives. The legislature created the Massachusetts Water Resources Authority (MWRA) on the last hour of the last day of the 1994 legislative session. But from the beginning the MWRA has been under a strict federal court order to clean up Boston Harbor by 1999.

Today the Boston Harbor Project is 80 percent complete. Ratepayers have paid almost $2 billion out of the $3.4 billion project.

Condoms, tampons, and toilet paper floated amidst opaque slicks of grease and scum when George Bush cruised the waters of Boston Harbor nine years ago. Two huge plumes of fetid waste water snaked for miles out of the harbor and into Massachusetts Bay. Every day, on the outgoing tide, the two sewage treatment plants released 30,000 tons of concentrated sludge. The sewage of two million people turned the water black.

Divers told of diving through a miasma of toilet paper that hung like a cloud above the harbor floor. Their feet would sink calf deep into gelatinous black ooze the consistency of mayonnaise. One particularly large field of this "black mayon-

naise" was in the eddy off of Nix's Mate, an island where the carcasses of dead pirates would be left to rot as a lesson to sailors of another era.

Seventy percent of the harbor's winter flounder had lesions and cancers of the liver. The state sent out advisories warning people not to eat the tamale from lobsters caught in Boston Harbor. During the hot summer months menhaden died and rotted by the thousands when they ran out of oxygen in the Inner Harbor's waters. The bottom was largely devoid of life except for swarms of *Capitelladae* worms, the indicator species scientists use to identify grossly polluted waters, that slithered across the dead and dying seascape, consuming abundant supplies of detritus and pollution.

What have the ratepayers got for their efforts? Today the project to clean up Boston Harbor is almost done, and the results have been impressive. The scummy slicks are largely a thing of the past. They disappeared after the MWRA started to collect and landfill scum in 1988.

In December, 1991, the MWRA stopped dumping 30 to 40 tons of sludge per day into Boston Harbor. Now the sludge is barged across the harbor to Quincy where it is made into pelletized fertilizer and sold, rather euphemistically, as "Bay State Organic."

The results are readily apparent. Throughout the harbor fishermen, marina operators and boaters can see the difference. The water is visibly cleaner. In places water clarity has jumped from two feet to twelve feet.

The proof of the pudding lies on the bottom. The large fields of "black mayonnaise" have been swept away by underwater currents; only the natural, gravely bottom remains. On top of the gravel are miniature reefs of six-inch tube mats. These are the home of the amphipod *Ampelisca* that have replaced the swarms of Capitellidae.

Aside from worms and amphipods the results were so impressive that Jantzen sponsored a one-mile "Swim For Boston Harbor" in 1992, something that would have been unthinkable in the 1980s.

Seaworms and amphipods may seem insignificant, but Massachusetts was turned down in its attempt to obtain a waiver to avoid cleaning up the harbor because of the abundance of *Capitellidae*. The welcome amphipods now cover 60 percent of the bottom, up from 25 percent in the 1980s.

Scientists themselves have been surprised at how quickly the harbor has come back. Mike Conners, chief scientist at the MWRA, explains that the harbor averages 31 feet and has nine-foot tides. "That supplies a lot of what scientists call flushing action. Of course, if you spend close to a billion dollars you can expect to see results," says Connors.

In January, 1995, a new, primary wastewater treatment plant went on-line. (The old system relied on diesel pumps that were broken down about half the time. The Smithsonian wanted to acquire one of the pumps because it was the only pump of its kind still in existence. They had to wait, however, because the pump was still doing its best to pump sewage through the system.) The old pumps had also gained a certain notoriety from their habit of breaking down at inopportune moments. On Mother's Day 1983, a rain storm had overtaxed the system and the main building of the Deer Island Sewage Treatment Plant filled with raw sewage. Two divers had to dive down through two stories' worth of human waste in order to drain the building.

Bill Sargent

Boston has a long tradition of dumping in its harbor.

Once the new primary treatment facility was in place, the amount of solids released from the plant dropped from 126 tons in 1986 to 61 tons in 1995. Boston also had a new addition to its skyline. A dozen 140-foot-tall "digester eggs" now greet passengers as they fly into Logan Airport. Inside the eggs, bacteria consume the sludge as it slowly circulates up one side and down the other. Methane, 50 tons of it every day, collects at the top of the "eggs." The gas is used to heat and power the plant, saving close to a million dollars in fuel costs every year.

Most interesting is the change in people's expectations. When the cleanup was first proposed in 1984, only 5 percent of the population thought it was really possible to clean up Boston Harbor. The *Boston Globe* ran editorials that supported reducing health hazards, but questioned whether ratepayers should be asked to pay billions of dollars to clean up a harbor that would always be dirty.

Now that people can actually see the results of the cleanup, pressure is mounting to do even more. The beaches are as swimmable as they were in the 1930s, when places like Nantasket and Revere were famous summer resorts. In 1996, the MWRA launched the "Back to the Beaches" campaign, spending $30 million to truck in clean sand and advertise the renaissance of the city's beaches. The campaign worked.

Secondary treatment will be phased in during 1997, 1998 and 1999. New equipment will clean the harbor further by removing more solids through aerobic bacterial treatment of wastes.

Still, primary and secondary treatment do little to remove nutrients, particularly nitrogen, which acts as a fertilizer to cause algae blooms. That will only happen when a new nine-and-a-half-mile outfall pipe is operational, just before the close of the century.

The outfall pipe will be as controversial as other parts of the project, when individual communities fought local aspects of the plan. Walpole didn't want landfills; Winthrop didn't want construction trucks; Quincy didn't want odors. The MWRA has been obliged to negotiate, compromise and resolve each community's concern.

Nobody likes the symbolism of a huge outfall pipe sticking out into Massachusetts Bay. Some claim that the pipe will just move the nitrogen problem out of Boston Harbor and into Massachusetts Bay.

The controversy could pit two federal laws — the Clean Water Act and the Endangered Species Act — against each other, because the end of the outfall pipe will be only 15 miles from Stellwagen Bank, the feeding ground for 350 endangered Northern Right Whales.

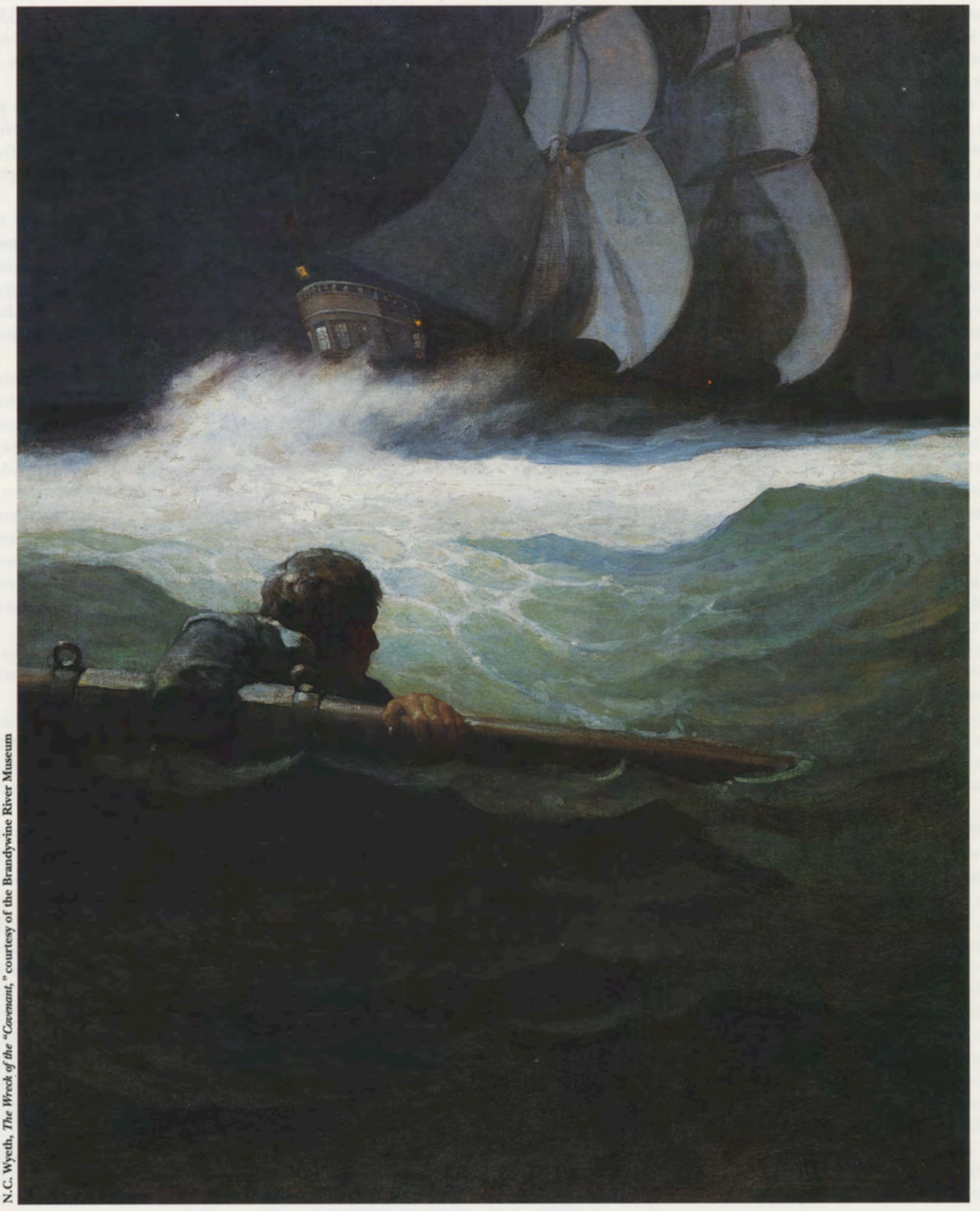
The controversy, if it erupts, will probably be more legal than scientific. The science suggests that the nutrients will dissipate quickly to background levels, and that the pipe will be like a freshwater river emptying into the ocean, except that this one will be nine miles offshore.

Critics counter that the nitrogen could enhance the blooms of "red tide" organisms that sweep down from the north each spring. Others deem this scenario to be unlikely.

Under the old system, it took three days for the sludge, the "black mayonnaise," the scum, the waste water plus the nitrogen to be carried by currents to the site where the new pipe will release its "almost swimmable" waste water. The nitrogen will be there, but it is expected to dissipate so swiftly that it will pose no threat. The waste water itself will be several-fold cleaner than it was before the cleanup began.

Boston Harbor, the region and Massachusetts Bay will be cleaner than they have been in a century.

***Bill Sargent**'s most recent book is* Storm Surge; A Coastal Village Battles The Atlantic.



N.C. Wyeth, *The Wreck of the "Covenant,"* courtesy of the Brandywine River Museum

The HALIFAX Mystery

When a British schooner struck a rock and sank off Machias in 1775, a court martial blamed the pilot but didn't punish him. Two centuries later, a veteran sailor offers an explanation.

ROGER F. DUNCAN

ON THE EVENING of February 14, 1775, His Majesty's armed schooner HALIFAX lay in the harbor at Cranberry Island off Mt. Desert. At noon the next day she was wrecked on a rock in Englishman Bay, where she left her bones, her guns and her name.

What was HALIFAX doing there, how did the wreck happen, and who was responsible?

In the fall of 1774, Admiral Graves, in command of "His Majesty's ships and vessels on the North American station," and General Gage, military governor of Massachusetts, felt the colonists rising against them. In response to the Boston Tea Party of December 1773, Parliament had passed the Boston Port Act, closing the port of Boston except for food and fuel necessary for the support of the military and civilian population. Also in 1774, the King, by an Order in Council, forbade the export of saltpeter, gunpowder and arms from England and their import into the colonies from any source whatsoever. The colonies, already on edge over increasingly oppressive Parliamentary acts and outraged by this new evidence of British tyranny, came to Boston's aid and escalated the conflict. Illegal provincial governments were established; the Continental Congress met in Philadelphia and proclaimed a non-importation agreement, a boycott on British goods. Customs officers, sheriffs, judges and British sympathizers were mobbed and their houses wrecked. Sons of Liberty seized cannon, powder and small arms from British forts in Portsmouth, New Hampshire; Newport, Rhode Island; and New London, Connecticut. Many towns were drilling Minutemen and gathering powder and weapons smuggled in from European and West Indian ports.

Courtesy of Smithsonian Institute

Admiral Graves was expected to enforce the Boston Port Act and to stop this smuggling, but he had at his command only four unwieldy, deep-draft ships of the line, ten sloops-of-war (which were smaller, handier, but still slow to windward and of too deep draft) and ten schooners. With these vessels he was expected to cover the North American coast from the Bahamas to Newfoundland.

Yankee sloops, schooners and whaleboats, smaller, faster and light of draft, infiltrated the inlets, bays and sounds, and even Boston Harbor, almost at will. Graves, trying to kill hornets with a baseball bat, was a very frustrated Admiral. He wrote to the Admiralty in London on December 15, 1774:

what Ships or Vessels can be spared will be doing considerable Service by being spread along the Coast to the Eastward, at places either notorious for smuggling, or where Arms and Ammunition are most likely to be thrown in during the Winter. In this idea I have order the GASPEE Brig, lately returned from protecting the Fisheries in the Bay of Chaleur and Gaspee, with the HALIFAX Schooner to be stationed from Cape Elizabeth on one side of Casco Bay to Passamaquody harbour, and have given their Commanders Directions to take every opportunity of Winds and Weather to move suddenly from place to place, without their Intentions being previously made known to any person, by which means they will in the Course of this Season visit the greater part of the Harbours within the Limits of their Stations: and although they may not be successful in seizures, yet I apprehend the Knowledge of their being on the Coast may prevent considerable Importations of smuggled Goods and Arms and Ammunition.

HALIFAX was a chunky little two-masted schooner about 60 feet long, setting square topsails on both masts. An existing model of the vessel probably depicts her namesake and successor, with which she is often confused, but it gives a good idea of what kind of vessel she was. Built about 1765 as a merchantman, she was bought into the Navy in 1768 and armed with six four-pounders, each firing an iron ball a little smaller than a tennis ball. She was commanded by Lieutenant Joshua Nunn, her sailing master was Thomas Sparke and she carried a crew of 20 men, although rated for 30. She was not a seaworthy vessel, for the Admiral wrote of her to the Admiralty on January 8, 1775:

The HALIFAX Schooner is so very leaky and out of Repair and is in such continual want of patching to make her swim, that she is totally unfit for any Service but to be at anchor, which I have directed her to do this Winter, and in the Spring intend to have her surveyed; she is a very bad low Vessel, and so extremely wet and uncomfortable to the Sea men that no consideration will keep them belonging to her.

Nevertheless, he had written on January 2, "The HALIFAX Schooner went to her Station from Manahigan Islands to Passamaquoddy with Directions to carry SCARBOROUGH's sails, now repaired, to her at Piscataqua."

Lieutenant Nunn did his duty. On the night of February 14, 1775, he was at Cranberry Island off Mt. Desert. Without "his Intentions previously made known to any person," he weighed anchor at 3:00 a.m. and steered east across Frenchman Bay with a fair northwest-by-north breeze. He was guided by a pilot who said he knew the coast as far as Machias, where another pilot was to be employed to take HALIFAX on to Passamaquoddy.

About dawn, around six, they were off Schoodic Point, the mountain standing high and black over low-lying Schoodic Island. They continued eastward with a light fair wind, and passed the long low point of Petit Manan around eight o'clock. The pilot, wary of the wicked ledges off Petit Manan, had been on deck thus far, but with Petit Manan astern and 16 miles to go to Moose Peak, high land with bold shores, he might have gone below for breakfast. He was back on deck before nine, when the wind shifted to the west and then west-southwest and began to pick up. HALIFAX tucked up her skirts and ran before the growing breeze, making about six knots and doubtless leaking like a basket with the watch on deck pumping vigorously. By eleven o'clock she was up to Moose Peak, running past the high cliffs of Crumple Island and Red Head, passing Main Channel Way, the Cow Yard and on to Black Head. Old HALIFAX was now going all of seven knots in a smother of foam.

At Black Head, the pilot had to make a decision whether to pass outside Libby Island and swing up Machias Bay, a clear course with no obstructions, or to take a shorter course inside Libby Island, or go inside the Brothers and through the islands and ledges of Foster Channel. This latter course would give a little smoother water. He might have considered it a little shorter as well, and the tide was high and still coming. For whatever reason, he decided to go inside.

He headed first for the Brothers, their two high, rounded domes an unmistakable landmark. Soon after, he saw Pulpit Rock, also an obvious landmark, and headed inshore, the

increasing wind now well on his port quarter. As he raced by Pulpit Rock, he had to swing to the east to pass Sheep (now Halifax) Island, and this meant gybing or tacking to get the mainsail and foresail on the other side as the wind was now coming over the starboard quarter. This maneuver carried him somewhat to the north of Pulpit Rock. As he straightened out on an easterly course, he told sailing master Sparke to take in the fore topsail and range the anchor cable on deck, for they would be anchoring soon. Lieutenant Nunn, eyeing Sheep Island with some apprehension, asked if he was not a bit too close to shore. The pilot, at the tiller himself, assured Nunn that all was well.

As they ran along the shore of the island at seven and a half knots, a prodigious speed for stout little HALIFAX, she struck the rock, which was not breaking because it was high water.

In the words of Thomas Sparke at the court martial, "She went over the first rock and came round with her broadside to the wind, fell into a pit among the rocks, and there she lay." Her rudder was gone and she was "sieved" three feet. After trying to force her over the rock with the headsails, they got the sails off her and soon realized she was a total loss. Under the direction of Nunn and Sparke, the crew got the boats out and began to ferry provisions ashore.

But what of the pilot? Thomas Sparke again: "He had not the power of speech he was so frightened. When he had recovered his fright, he said he knew of those rocks but that he had borrowed a [document torn] he could save a trip or two."

The wind continued to increase, and with the tide ebbing fast, seas broke on the rock and washed over the decks. Nevertheless, they worked until low water, six o'clock, when it got dark, saving all they could. At last, they could get out and walk on the rock and see that HALIFAX would never sail again.

In a cove on the east end of the island, they set up a camp in sight of the wreck. As the tide came, the seas struck her harder, rolled her over, and finally made a clean breach over her. In the morning, nothing of her was visible but her masts floating above the rock, held by their rigging.

During the night, it blew harder with frost and snow but by morning was more moderate. Nunn ordered Sparke to take the surviving boat, presumably with men to row it, and seek help. Because Sparke was unacquainted with the region, he took the pilot for a guide — with Nunn's express order that he not allow the pilot to escape.

By the shortest possible route, it is only about six miles to

Bucks Harbor. However, the pilot lost his bearings, possibly getting into the shoal water north of Foster Island, and they had a miserable time. It was cold and blowing hard. The boat leaked badly. Occasionally seas broke into the boat. Those not rowing had to bail for their lives. At last, about three o'clock, they got into Bucks Harbor, the pilot by now "quite delirious." They were so cold and wet that they could scarcely stand, but made their way to a house where the woman there warmed them up and restored life. And the pilot slipped away.

Sparke, once warmed up, went in search of one Mr. Beale, who had a small schooner, found him very willing to help, and the next day returned to the island, rescued the castaways and took aboard what they had saved from the wreck.

Soon after, they got passage to Boston in a sloop, arriving February 28. A court martial held March 9 acquitted Nunn, Sparke and all the crew, laying the full responsibility on the ignorance of the pilot. But they did not give the pilot's name!

Within a few weeks, Nunn was given command of the cutter FOLKSTONE and sent to England with confidential despatches, whence he returned and joined Graves's fleet. Sparke was employed in supplying the personal needs of Admiral Graves. The citizens of Machias salvaged the guns from HALIFAX and sold them back to the British in June a few days before the Battle of Machias.

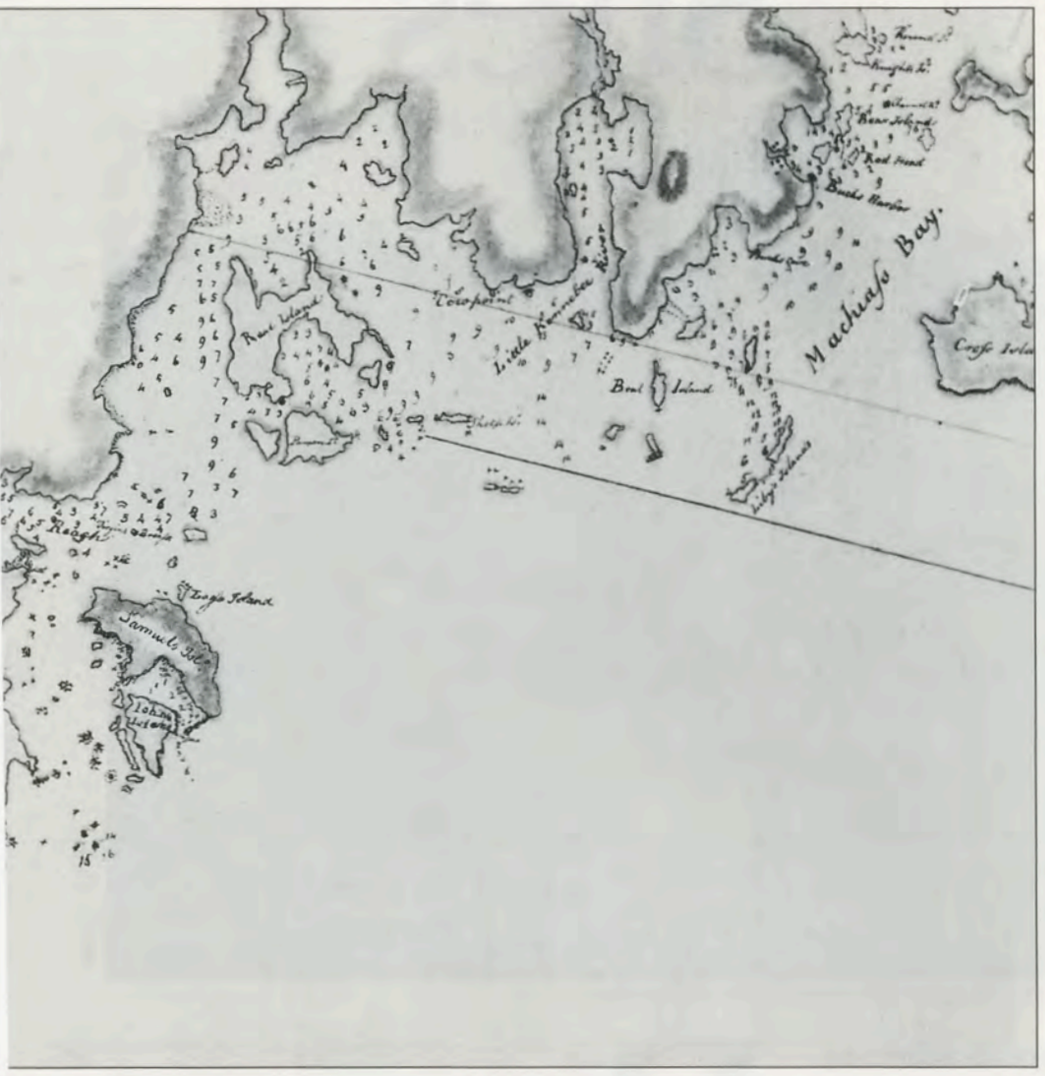
But what of the pilot?

He was blamed by the court martial for the loss of HALIFAX.

Why, then, was his name not given and why was no warrant sworn out for his arrest? Did he wreck HALIFAX through inattention, on purpose, or through ignorance? Unfortunately, the log of HALIFAX and Lieutenant Nunn's journal have been lost. The records in the Greenwich Maritime Museum in London give us no help. We are driven to speculation. The following seems to me a possible explanation.

The town of Machias was founded in 1763 by lumbermen who

had been burned out of Scarborough. In 1775, the inhabitants were so busy cutting and sawing lumber that they depended on trade with Boston for tools, clothes and even for most of their food. Therefore vessels were going back and forth to Boston with lumber and firewood. They were admitted to the port under the Port Act because they were carrying lumber for barracks for British soldiers. Major Pitcairn's 500 marines, later to appear at the bridge in Concord, were living aboard the vessels that brought them to Boston until barracks could be built.



General Gage wanted the soldiers ashore under his command. Also firewood was necessary for both military and civilian inhabitants of Boston. A Machias skipper bringing necessaries to the British would likely be friendly with them and would almost certainly be a Loyalist. If he were asked to recommend a pilot for a naval schooner on the Maine coast, he might well name one of his relations who had sailed with him.

If the pilot was a Loyalist, why, then, did he wreck the vessel?

Probably he did not intend to do so. Remember that he had been on deck since 3 a.m., except for breakfast. He was eager to get home. He knew the way through Foster Channel, which would require that he sail along the south shore of Halifax Island and round its eastern end. It is rather a tricky spot, so he took the tiller himself as Sparke testified at the court martial. At seven and a half knots, he knew that he would soon be in Bucks Harbor or Machias and directed Sparke to take in the fore topsail and range the cable on deck. Possibly Nunn, in unfamiliar waters, had been pestering him all day about being too close to this or that island or ledge and the pilot was a bit exasperated. His mind was on getting around the island and through Foster Channel. It was high water and the rock was not breaking. He was tired, in a hurry, distracted and as others have done in such cases, made a serious mistake.

Quite naturally, immediately after the wreck, he would be so upset that he could not talk coherently, and then would be so shaken that he would admit he knew the rock was there.

The next morning, the tide was low and rising, a fair tide up the bay. He may have planned to go inside Foster Island, a possible passage for a small boat with local knowledge in clear weather at high water; but in thick weather with rough seas at half-tide, it could be frightful. However, he did make his way into Machias Bay, possibly across Starboard Island bar when the tide reached its peak, then past the breakers off Howard Point and into Bucks Harbor. He and everyone else must have been suffering badly from hypothermia and more or less delirious.

If the pilot was a local man, certainly the lady of the house would help him to "slip away." He was well advised to do so.

Finally, why did the court not name him and swear out a warrant? If the pilot was a Loyalist and also a relation of the skipper who was supplying badly needed lumber and firewood to the army in Boston, Graves and Gage may have seen it as quite unwise to offend one who was helping them. Furthermore, HALIFAX was in such bad condition that she may have been more of a liability than an asset to Graves, and he may not have been sorry to see her lost. He was quick to purchase a replacement of the same name.

Other explanations are possible, and the reader is invited to find one more probable than the above.

Roger F. Duncan *is author of "A Cruising Guide to the New England Coast." He acknowledges gratefully the help of Robert C. Brooks of Sandy Point, Maine, who located important documents in England.*

The principal source for this story is the record of the court martial of March 9, 1775, in which Nunn, Sparke and boatswains mate Richard Bartley testified at length. A letter from Nunn to Graves dated March 1 gives a shorter version. That letter, the quotations from Graves's letters and material behind the brief assessment of the political situation comes from Naval Documents of the American Revolution, vol. 1. The material on Machias is from Narrative of the Town of Machias by John F. Drisko. My wife and I sailed down to Halifax Island last September, taking the same route as we assume the pilot steered. We saw the rock at low water, landed on the island and took a few photographs.

The Des Barres chart was published in 1776 but was surveyed before that so it gives a fair idea of what was known at the time. We do not know whether the pilot had a chart or not. Certainly a resident of Bucks Harbor or Machias would have a more intimate and accurate knowledge of the island, the passage inside Foster Island and Foster Channel.

Lines of HALIFAX are published in American Ships of the Colonial and Revolutionary Period by John F. Millar and in History of American Sailing Ships by Howard I. Chapelle. Millar has the ship's history correct but shows the lines that Chapelle says are of the later HALIFAX .

Silent Sites

R. Lewis

One of the oldest known prehistoric coastal sites in New England lies at the North Haven Turner Farm.

Eagles enjoy more protection than Native American archaeological remains

DEBORAH DUBRULE

PAUL BISULCA PROVIDES his guests at the State House with a silent memento: a copy of a 1755 bounty notice, resplendent in old English script, ordering His Majesty's subjects "to embrace all opportunities of pursuing, capturing, killing and destroying all and every of the aforesaid [Penobscot] Indians." Like a menu, the proclamation lists rewards in Pounds Sterling for the following:

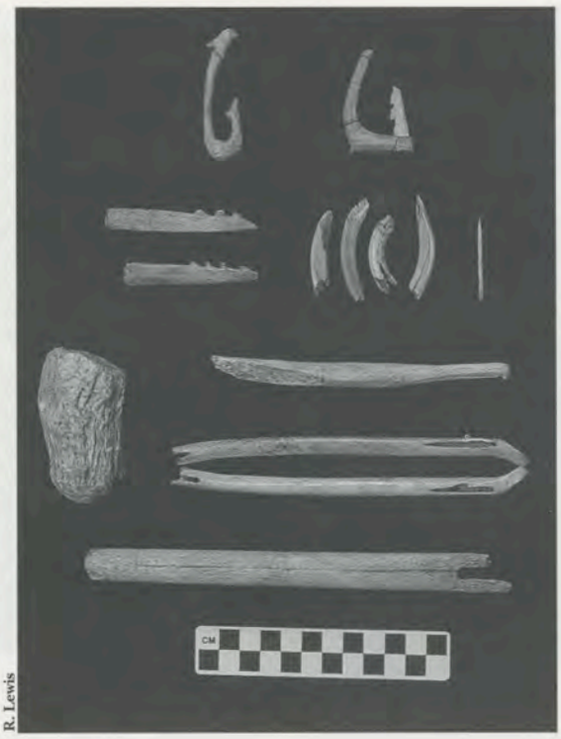
A live male above the age of 12: 50 Pounds
Each scalp from a dead male above the age of 12: 40 Pounds
Any live female or male under 12: 25 Pounds
Each scalp from a female or male under 12: 20 Pounds

With this fragment of human history, the tribal representative of the Penobscot Nation in Maine's House of Representatives speaks clearly about the past without uttering a sound.

"I think it's pretty fundamental with people generally that they have this interest in who they are, where they came from, what happened long ago, how we ended up where we are," observes Bisulca. "You see, we're at some disadvantage. We didn't have a written history, so it's easy to forget the past, one's own history, unless we rely on archaeological sites. The island and coastal sites are important to us because we were driven from the coast 250 years ago. They're all we have left of our existence there."

The maritime histories of the four surviving tribes in Maine — Penobscot, Passamaquoddy, Maliseet and Micmac — are encased in more than 4,000 archaeological sites that dot Maine's coast and islands, according to prehistoric archaeologist Arthur Spiess at the Maine Historic Preservation Commission, the agency charged with mapping them.

These prehistoric sites silently describe the pattern of people's lives and the evolution of their environment over the last 10,000 years: what fish they caught, how they hunted and traded, which plants they used for healing, which diseases ravaged their populations, how they buried their dead.



R. Lewis

Over the last two centuries, countless sites have fallen victim to roads, marinas, housing and industrial development — not to mention tourists and locals collecting Indian souvenirs. Today erosion, looters, hobbyists and shoreland development persist in silencing the voices locked inside these mementos — voices that can illuminate human history and explain changes in our environment.

Federal and state laws protect eagles, historic homes, wetlands, commercial fishing areas and Native burial grounds, among other things. But unless an archaeological site rests on federal or state land, enjoys a protective easement or merits a listing on the National Register of Historic Places, few legal provisions exist to protect these treasures. Because the majority of sites lie on private property, the responsibility for their protection rests, overwhelmingly, with local planning boards and individual landowners.

Yet an added dimension in determining the fate and protection of sites is the growing interest in them expressed by Natives, who historically have been excluded from the process of federal and state decision-making. "It's our history locked inside these sites," noted Bisulca, who proposes a tribal-state task force to address the future of sites and their contents.

Short on real estate but rich in history, Maine islands have supported people for more than 10,000 years. In fact, one of the oldest known prehistoric coastal sites in New England lies at the North Haven Turner Farm. Evidence from this and other islands has demonstrated that Natives lived, worked and traded on Maine's inshore islands year-round, as opposed to the long-held myth that they were "summer people." In addition, archeologists suspect that island-based Indians hunted swordfish, used islands as whale hunting or butchering stations, and moved from small islands in summer to larger islands during the winter months (Island Journal, 1984).

Although several types of prehistoric (from before 1600 A.D.) sites exist, such as burial grounds and rock art sites, the majority of coastal and island sites are commonly shell middens lying within the shoreland zone, less than 250 feet from the mean high water mark.

Ranging in size from a few square yards to thousands of square yards, these prehistoric mounds of mussel, oyster and, most typically, white clam shells harbor the garbage of Native people. The shells neutralize Maine's acidic soil, preserving food bones, bone tools and sometimes human and animal skeletons that normally would have decomposed with time. Middens are found near residences and villages that were located where tides would least affect launching or landing a canoe and close to a fresh water source. Some of the sites are conspicuous while others, though no less significant, are hidden by grass or trees. Others have been swallowed by the sea: one site near Deer Isle lies 30 feet underwater (Island Journal, 1993).

Shell middens represent the best source of information about the human and environmental history of the last 5,000 years, according to anthropology professor David Sanger at the University of Maine in Orono. "Since Native people of North America had no form of writing, we can learn about their past in two ways," he says. "One is through oral traditions that Natives maintain today and the other is through archaeology. They're two entirely different kinds of data sets."

Native voices

What remains of oral traditions varies among Maine's four surviving tribes. Natives' forced migration away from the coast and the annihilation of their population through disease and war, estimated at nearly 90 percent, left highly fragmented groups speaking different languages within the 10 percent who survived European occupation.

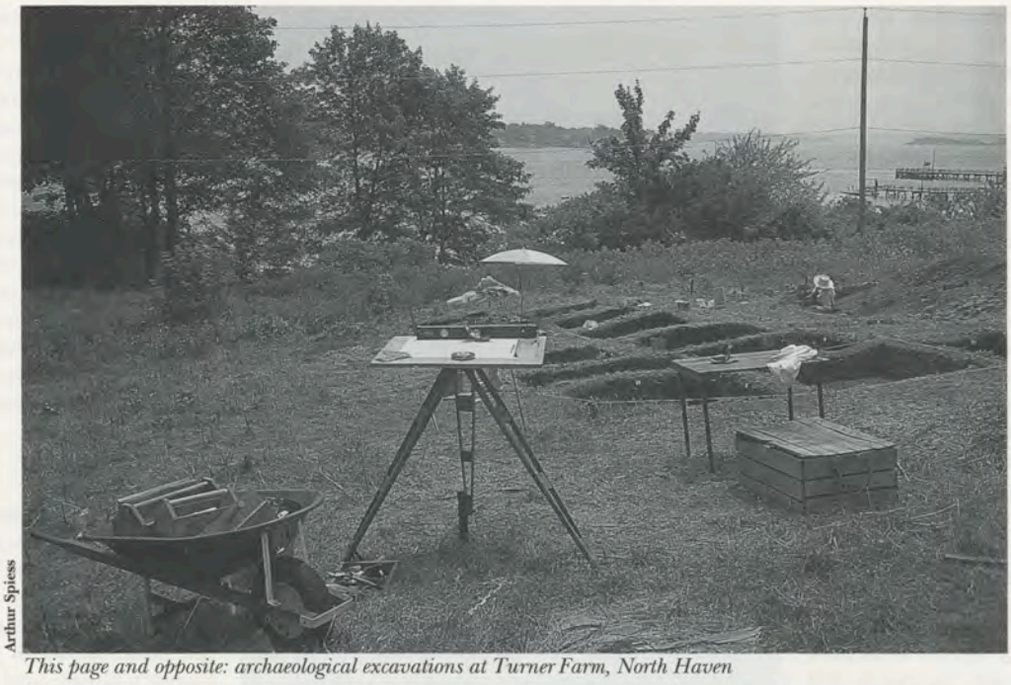
"Some would describe our oral history as mythological because much of it surrounds legends about how the human race began, the relationships between people and animals and the environment, the origins of places in the landscape," explains Bisulca, a 48-year-old retired infantry officer who grew up on the Penobscot reservation, attended the Indian Island School, and graduated from the U.S. Military Academy at West Point. "The dilemma with any oral history is that it's subject to personal interpretation each time it's told and the current environment affects how you understand what you've just been told. So it's not an accurate reflection of what took place in the past. We *have* to depend on archaeological sites."

Passamaquoddy tribal representative Frederick Moore, III, says that Native stories are very much like biblical accounts. "They are no more mythological because they are not written," observes Moore. "Our culture is so alive and vibrant that we did not need a written language. Our culture is stronger because it isn't written. If people want to find out about Native people, they can get to know us. We're alive and well and ready to educate anyone about our existence."

Moore is sharply critical of archaeologists and others who excavate sites. "People who wish to dig up other people and their possessions will sprout with justifications for what they are doing," said the 36-year-old Moore, who also works as a commercial fisherman and in his family's basket business. "If we were to go to Jamestown or Plymouth Rock and start digging for artifacts, or dig into colonial graves, we'd be in jail!"

Bisulca, the Penobscot representative, supports tribal education and involvement in archaeology, as well as the expansion and development of the reservation museum, while Moore opposes any excavation or tampering with resources unless it is to determine the extent of burial sites and remove artifacts or human remains in an area slated for industrial development.

Ironically, Passamaquoddy Tribe members are often commended by archaeologists for their increased participation in professional digs and their sponsorship of field schools. When asked about the growing involvement of tribal members in these endeavors, Moore answered, "The rule of our people is not to disturb anything. Certain tribal members will participate in these digs. They are misguided if they are participating in any digs, with certain exceptions. For the most part, we don't like these objects being displaced by anyone. We are concentrating our efforts at curbing these activities."



Arthur Spiess

This page and opposite: archaeological excavations at Turner Farm, North Haven

Both tribes have museums on their reservations.

Carole Bear Binette, a Penobscot, is a 26-year-old anthropologist who worked for the University of Maine in Orono for eight years. She sits on the board of trustees of the Abbe Museum in Bar Harbor, a private institution known for its close working relationship with Maine's tribes. She also works as a census coordinator and rights-protection researcher for the Penobscot tribal government, and says she understands the Passamaquoddy representative's point of view.

"The Passamaquoddies know more about their language than we do, so their word-of-mouth traditions are stronger," Binette says. "And I agree that if the land is going to be destroyed, the objects ought to be removed rather than bulldozed. But I'd rather see the objects used for the public good — for science, for education. I'm more of a scientist, I suppose. I'd rather know more about our culture through science and we can gain more knowledge by digging than by not digging. The information we've acquired from sites has helped to debunk myths about Native people, and that's going to continue."

The lack of tribal involvement in policy-making decisions concerning the sites disturbs both Moore and Bisulca. "Since this is principally the Natives' history and culture," Bisulca emphasized, "they should be participants in decisions establishing long- and short-term goals concerning these sites, identifying those sites that may be imperiled by the casual archaeologist or other natural causes of destruction, and deciding which sites to excavate and which sites to leave alone. So far, the leadership of the state has never formally shared any of that information with us."

Silent threats

The archaeological practice of carving square and rectangular boxes into the earth in order to mine it for the fragments of human existence and environmental history is, in itself, a destructive one. "The French call it 'the silent memento,' " explains David Sanger. "You leave a part of the site for the next generation of archaeologists. You recognize that techniques and technology will be better in the future, so unless a site is going to be totally destroyed anyway, the usual attitude is not to dig the whole site but only a sample — enough to satisfy the rationale for being at the site in the first place."

Maine's rising sea level — 200 feet higher today than it was 10,000 years ago — coupled with wave, wind and ice erosion continues to eat away at sites along the coast and islands. "Erosion is the biggest single threat to sites because it takes all of them indiscriminately," notes Sanger, a professional archaeologist who arrived at the University of Maine in 1971. "If you look at the sea level curve in the past, there are periods of stability and periods of enhanced erosion. But sea level is rising faster now, especially downeast," he says. "We've lost a lot of coastal sites in the last 20 to 30 years. I don't think we'll have any left in Washington County 50 years from now, they're eroding so fast. In more protected areas inland and along indented shorelines, that's a different story."

Nathan Hamilton, associate professor of archaeology at the University of Southern Maine, also emphasized the erosion blight on the western coast. "Within my lifetime, 50 percent of the sites that exist in Casco Bay today will be gone," predicts 40-year-old Hamilton, who has pinpointed 530 sites in and around Casco Bay. "They'll either be destroyed by erosion or lost to looters. Trying to curb looters could be a lifelong mission in itself. Careless digging increases the process of erosion and continues the attrition of the archaeological record."

In addition, Hamilton estimates that 20 percent of the shell heaps on Casco Bay have been systematically looted since colonial and Victorian times. Vandals and hobbyists, archaeologists agree, not only hasten the erosion at a site, but destroy the scientific value of these resources in their search for artifacts.

"Generally, archaeologists aren't interested in the artifact itself," explains Sanger. "It plays only a minor part in the whole story. But once it's pulled out of the ground, it destroys the context of the site — that is, everything around the artifact that gives it significance: the sediment, the food bones, the relationship of the objects to each other, the relationship of the objects to a house floor or a fireplace, for example. Even the shells themselves hold a lot of information about water temperatures of the time, as well as the time of year the shellfish were captured."

Hamilton, who has lectured on Chebeague, Long, Peaks and Great Diamond islands and leads field schools for archeology enthusiasts, estimates that at least one person in 100 "is going to be a detriment to the archaeological record" when he gives public talks on the subject. "That's all it takes — just one person slowly working away — to eat up the record. The only thing I can do is try to re-educate them so they'll stop ransacking these sites.

"One man worked on a site in the north end of Casco Bay," Hamilton recalls. "He was looking for whole arrowheads and he dug the entire shell midden with a clam hoe. He pulled the site into the clam flat and the whole thing eroded away. We had surveyed that site four years ago and it was beautiful. Now it's gone. It's gone and there is no bringing it back."

Archaeologists concur that most "hobbyists" do not realize the damage they leave behind in their search for souvenirs.

"They're stealing human history," emphasized Rebecca Cole-Will, curator at the Abbe Museum. "For the last year, someone

Arthur Spiess

has been destroying an island site up here with a clam rake. We're trying to get the site listed on the National Register of Historic Places so the landowner can stop whoever's doing this," she said.

"If you own property in Maine and a deer wanders onto it, you don't have the right to shoot it any time of the year," Sanger observed. "You can only destroy that animal in season and you're required to get a special license. You can dig up an arrowhead without a license or sanction — in our society, a deer is more important than human history. It's what state law supports."

Not one of the archaeologists interviewed for this article could recall any site that had not been looted following a scientific excavation unless a caretaker or landowner was in residence year-round. Yet to date there have been no prosecutions or convictions in Maine for molesting archaeological sites or removing artifacts, according to Spiess at the Historic Preservation Commission.

"We're losing sites by the dozen as people build summer cottages on the coast of Maine and its islands," said Sanger. "There are people who wouldn't even consider disturbing an osprey's nest, but wouldn't think twice about building on top of an archaeological site."

Despite statewide shoreland zoning rules mandated in 1990, development continues to dampen or mute the voices locked inside Native sites. Erosion continues as well. Special variances issued by planning boards, expansions of grandfathered structures, which don't require permits, and exemptions for businesses can bring development well within the typical 75-foot minimum setback from shore and well atop a shell heap.

Protection: "we don't want to provide them with treasure maps"

There are four levels of site protection, according to Spiess: a listing on the National Register of Historic Places; local land protection laws adopted by local planning boards; conservation easements; and the state's antiquities law, which protects sites that are posted against trespass, listed on the National Register, and covered with a conservation easement. None of these methods prohibits landowners from digging on sites they own.

Public information is a large question here. The Historic Preservation Commission will provide maps of "archaeologically sensitive" areas to local officials and interested parties on a need-to-know basis (distributing them, for the most part, through the State Planning Office's growth management program), but only landowners receive exact site location information, as well as details of site contents. "Once a site becomes public," explained Spiess, "unscrupulous collectors come in and destroy it. We don't want to provide them with treasure maps."

Expecting the public to favor protection of sites while simultaneously denying access to information about site locations presents a paradox. An informal survey of seven year-round islands [Inter-Island News, December 1996] revealed that most planning boards do not consider the matter when issuing a building permit. "Aside from a couple of shell heaps that are locally known on the island, we don't know where the rest of them are," said Isle au Haut building code enforcement officer Matthew Skolnikoff. "We know where the resource protection zones are, the wetlands and marshes, and we know exactly where the eagles nests are. Those zones are protected."

Fifteen years ago, Maine's Department of Inland Fisheries and Wildlife grappled with the same problem as it mapped the locations of eagle nesting sites. "The fear is that there are enough unsavory people out there who would be harassing eagles — or stealing from archaeological sites," observes endangered-species program coordinator Alan Hutchinson. "It's a Catch-22 situation. We wanted people to protect the sites, but we wouldn't tell them where the sites were. About 10 years ago, we changed our point of view — we had to overcome that fear."

Today Hutchinson's office directly notifies towns and landowners of site locations each year. More than 60 percent of the state's eagle sites are on private property. "It's a big responsibility for towns," he adds. "With eagles, it's worked beautifully. People in the communities became our best stewards."

Maine's 300 eagle nests are protected by state law. But, points out Spiess, "there are 20 times that number of archaeological sites, and there are no state or federal laws to protect them."

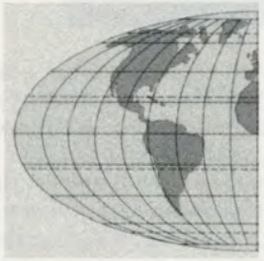
"These are non-renewable resources," adds Nathan Hamilton. "Unlike the eagle population, which rebounded, an archaeological site can't recover. Once it's disturbed, that's the end of it."

Property rights are the heart of the problem, suggests David Sanger. "Short of taking [sites] over, we're forced to fall back on the good will and social conscience of the landowner," he says. "If the landowner feels the archaeological information is valuable to society as a whole, we hope that the landowner prevents people from digging on it and that the landowner refrains from digging on it or building a summer home there. We've made some progress over the last 20 years, but we haven't gotten very far when it comes to preserving our historical past."

***Deborah DuBrule** is a frequent contributer to Island Institute publications.*

SMALL ISLANDS, sitting offshore from continental states but still astride continental experiences, have long offered their own involvement in the various courses of our history. Often they have been asylums and havens for those seeking refuge from mainland oppression: Skye was just such a safe place for Scots looking to reclaim their birthright. Similarly, islands have been maritime frontiers for those desperate for new lives: Cape Breton and Iceland offered prospects of new beginnings for their settlers at very different stress points of European history. But islands have also been birthplaces and homes to hundreds of distinctive cultures: consider Tonga and Fiji, each at various times the centers of powerful regional cultures and empires.

ISLAND BOUNDARIES AS A RESOURCE



In 1945 there were three small island states. Today there are more than thirty. Why the increase?

BARRY BARTMANN

Islands have been launch pads for imperial expansion, just as they have been victims of competing empires and civilizations. Hispaniola was the base for the European reach to the Americas, while Malta was invaded and trespassed by every major Eurasian civilization. More recently, for those seeking profitable ventures in offshore finance, island jurisdictions have offered a panoply of inviting arrangements from the conservative, well-established regimes of the Isle of Man and the Channel Islands to new regulatory systems from Vanuatu to Gibraltar, from the Caymans to Cape Verde.

Finally, for over a century, islands have presented themselves to travelers as holiday escapes from the stresses of mainland society: they allow idyllic retreats to gentle and often nostalgic sensibilities of community. The Isle of Wight or Mount Desert or Bornholm or Corfu, for example, present the simple joys of comfort and respite from the anxieties of life in mainland centers.

The mystique of islands, both imaginary and real, has moved generations of artists, from Daniel Defoe to Robert Louis Stevenson, Paul Gauguin to Jamie Wyeth. Islands have touched the human experience in rich and profound ways just as they have served a complex set of roles in their often turbulent relationships with mainland societies. In most cases, there remains a powerful sense of maritime separateness. Island peoples across the world have their own history and their own signature of intervention within the biographies of their continental partners.

Many small islands find themselves subject to the priorities and dictates of neighboring mainland communities, in spite of powerful sources of localism and separateness. Cape Breton Islanders stoutly assert their island identity in a rich cultural outpouring across the arts while they bemoan their political impotence in the absence of island jurisdictional institutions. Perhaps the Cape Breton situation is the norm, reflected in the relatively weak political and jurisdictional capacities of most offshore American and Canadian islands and so many of the islands of the European continental states. Consider the Scottish islands: most must be satisfied with the limited jurisdictional capacity of a municipality. Skye is subject to the comparatively huge over-arching authority of the Highlands and Islands Council. Only the

Shetlands, perhaps as Nordic as they are Scottish, the Orkneys and the Western Isles have locally rooted institutions of significant self-government.

On many Canadian and most American islands, there is a powerful sense of distinctive identity, of separate interests, of contending issues with mainland communities and mainland authorities.

Islanders here share a common sense of preserving both the environmental and the cultural integrity of each island community. Above all, there is determination to protect the institutions central to the preservation of the island community: the school, the local store, the fire department and bottom-line health services and support systems for elderly island residents. Every islander recognizes the unique character of his island, however wanting the jurisdictional capacities may be.

Some island communities in the United States enjoy vigorous powers of local government; others have a wide but deeply rooted community base of mutually self-reinforcing groups that together assert the particular interests and the common concerns of those islands. They may be groups dedicated to the protection of the environment, of beaches, dunes and other special island attractions; organizations concerned with wildlife management, particularly since most small islands are hosts to discrete patterns of wildlife settlement and migration; or groups committed to the cultural and historical properties of their island's history and life cycle.

Popular participation in the definition and protection of an island's special character seems to be evident in almost every island community along the New England coast. They do not necessarily need the kinds of jurisdictional levers demanded by more culturally and nationally differentiated islands. Still, on Nantucket, on Mount Desert, on Martha' s Vineyard, islanders feel a sense of island identity that projects their community separately and distinctly across a broad range of issues. There is usually huge community involvement in a variety of island-based decision-making bodies.

The seven North Atlantic small island jurisdictions — Prince Edward Island, Newfoundland, Greenland, Iceland, the Isle of Man, the Faroe Islands and the Aland Islands — represent a wide range of autonomy arrangements: provincehood within a federation in Prince Edward Island and Newfoundland, Crown Dependency Home Rule in the Isle of Man, Nordic Home Rule models in Greenland, the Faroes and the Alands and, of course, full sovereignty in Iceland. What powers count and in what context? How relevant, for example, is the Isle of Man's autonomy in accounting for Manx success in the services and manufacturing since the early 1970s? Is jurisdictional capacity a factor in explaining the huge disparities between two very similar North Atlantic rocks, Iceland and Newfoundland, the former an inspiring success story and the latter the poor child of the Canadian federation? Research undertaken by the Institute for Island Studies has targeted four sectors: primary food production, small-scale manufacturing, tourism and the export of knowledge-based services. The Institute also seeks to promote inter-island networking and cooperative projects such as joint ventures in software and North Atlantic tourism. This very ambitious initiative has won the support of all the island governments concerned — a commitment that is, in itself, yet another example of growing island self-consciousness in an increasingly competitive world.

Globally, of 24 small island states for which data is available, 16 enjoyed average annual growth rates of over 3 percent between 1985 and 1993, enviable by European and North American standards. Many of these islands — Malta, Mauritius, the Eastern Caribbean states and even the Maldives — had annual average growth rates in this period of between 5 and 9 per cent. Not a single island state recorded negative growth in this sample.

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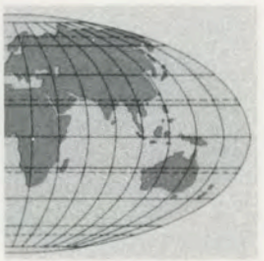
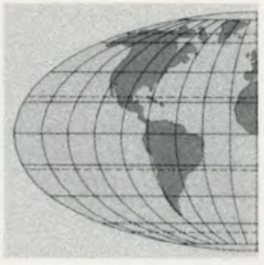


growth rates of over 3 percent between 1985 and 1993, enviable by European and North American standards.

Long Island, Maine,

is testimony

to the political



extrapolation of

island identity.

Similar patterns are evident in the growth of export trade. Most of these small island states have experienced a diversification both in the commodity composition of their export trade and in the geographic direction of that trade. Not only has there been growth in manufacturing in many of these small island jurisdictions, but a major expansion of services as well. Finally, there has been a diversification of capital sources both from the private sector and from official donors.

Most of these small islands were once almost wholly dependent in their trade relations on a metropolitan center. Certainly they were dependent on that center exclusively for sources of capital investment. Now they are able to present themselves to foreign governments, international corporations and multilateral organizations directly and on their own terms. Their status is a "green card" for entry into the world's boardrooms, there to exploit the phenomenon of globalization in the pursuit of niche strategies. For many, the risks of going it alone have been compensated by admission to the field. This also holds true for such non-sovereign islands as the Netherlands Antilles, Aruba, Bermuda, the Caymans and the Cook Islands, where a generous level of autonomy means that these governments can pursue similar strategies to those of their sovereign counterparts.

In their success, these islanders have powerfully asserted their proud, separate maritime identities, fulfilled their expectations of dignity and, most important in so many cases, broken the yoke of dependency.

Most of these small island economies, even if they have achieved some measure of diversification, will still confront the problem of dependence. They cannot expect an unfettered or uncompromised and boundless autonomy. But what sense is there in holding small island jurisdictions hostage to unrealistic and wholly intuitive models? Better for islanders to concentrate on an adroit exploitation of niche opportunities, imaginative uses of jurisdictional levers and incremental diversification at all levels of economic activity. Such an agenda of "dependence management" can be both confidence-building and materially rewarding at the same time.

The case of Long Island, Maine, is testimony to the political extrapolation of island identity. The 300 souls of Long Island felt oddly out of play in the city of Portland's municipal agenda, and after two years they won self-government as a municipality. Long Islanders now enjoy the jurisdictional levers to shape the architecture of their community, from school systems to social services, from environmental controls to investment strategies. There is a clear sense among the people of Long Island that the future of their island is now in their own hands. In various ways, other Maine island communities have taken control of their destinies as well.

Heightened sensibilities of identity and dignity are characteristic of island living. Worldwide, we are witnessing the assertion of those sensibilities through jurisdictional claims and competences that might be translated into unexplored areas of economic development. If those objectives can be realized, then both islanders and mainlanders have cause to rejoice.

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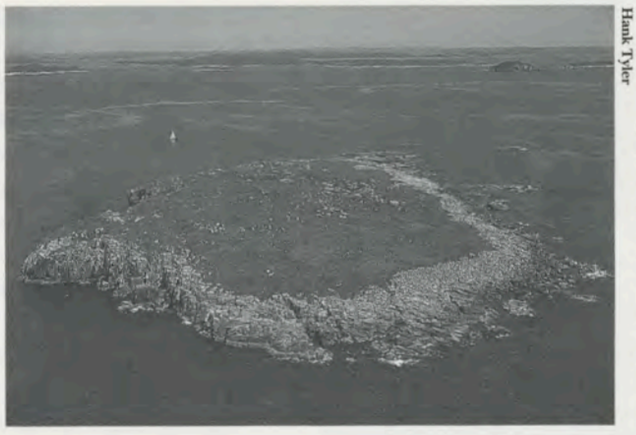
From Jordan's Delight

How a poet made himself a Mainer through his passion for the place

CARL LITTLE



Hank Tyler

IT SEEMS THAT Old Man God when he made this part of the Earth just took a shovel full of islands and let them drop." So wrote the American modernist painter John Marin about the stretch of the downeast coast around his home at Cape Split in South Addison. Among that "shovel full of islands" is Jordans Delight, which lies in the Bois Bubert quadrangle east of Petit Manan.

"Milbridge would naturally like to count so handsome a property within its bounds," Charles McLane points out in volume II of his *Islands of the Mid-Maine Coast*, "but surveyors persist in placing the [ship's] channel between Jordans Delight and Pond [Island]." For this reason, the island is claimed by the town of Harrington.

It was to Harrington that the eminent critic and poet R. P. (Richard Palmer) Blackmur (1904-1965) traveled with his wife, the painter Helen Dickson, through the 1930s and 1940s. And it was that nearby desolate island, which still sported an apostrophe in his day, that inspired a series of poems that serve as the centerpiece of Blackmur's first and finest book of verse, *From Jordan's Delight*, published in 1937.

Although born in Springfield, Massachusetts, Blackmur would claim later in life to be a Mainer by birth. Indeed, on the jacket flap of his most acclaimed work of criticism, the classic *Language as Gesture* (1952), one finds the statement, "R. P. Blackmur is a native of Maine."

Blackmur had some claim to nativeness, albeit not the hard-earned "son of the state" status few of us who live in Maine can actually claim. In Russell Fraser's excellent biography, *A Mingled Yarn: The Life of R. P. Blackmur*, we read that his mother's father and father's father were born near Fairfield, Maine. Until he was 16, Blackmur accompanied his family on summer holidays to the resort town of Bridgton; he also spent a year in Maine in the 1920s recovering from tuberculosis. "To himself," Fraser observes, "Richard was always a State of Maine man."

Until he was awarded a Guggenheim Fellowship in 1937 and soon after accepted the first of several appointments at Princeton University, Blackmur had lived for many years in near-poverty, barely making ends meet by selling used books, writing poetry and editing magazines, including the well-known literary journal *Hound & Horn*. One of the reasons he and his wife, who painted for the Works Progress Administration (WPA), left Boston each summer to stay at her family's farmhouse on Oak Point in Harrington was that living there was so cheap. "Helen and I can live . . . for just a hair over $65 a month," Blackmur wrote a friend.

During these long seasonal visits to Maine, which lasted, as Fraser reports, "until the hard frosts of October drove them back to the city," Blackmur absorbed his downeast surroundings, including the sea. He sailed among the islands and caught rides with lobster fishermen heading out to check their traps. According to his biographer, Pleasant Bay and Narraguagus Bay became part of Blackmur's "interior landscape."

It was on these trips that the poet discovered Jordan's Delight, "an island," as he described it to a friend, "off the mouths of Narraguagus and Pigeon Hill Bays, eastern Maine." Fraser provides a vivid description of the isle:

The best fishing was landward of Jordan's Delight, a spit of crumbling mountain that suggested a recumbent statue afloat in the sea. Only the torso was left to the statue; the legs were cut away at the thighs. Below them stretched the meadowland, breaking into rocks. The beach shelved steeply, a litter of broken rocks on which the herring gulls roosted. Sailors gave a lot of sea room to Jordan's Delight, and Richard and his friends didn't land there very often. In his mind he dwelled in the island, however, and he made poetry from what he saw and imagined.

From these outings and imaginings came two major verse sequences, "From Jordan's Delight" and "Sea Island Miscellany." Individual sections appeared in the

The Foggy Foggy Dew

O Jordan young Jordan O sailoring friend,
I'm sailing for ye that sailor no more;
thought the moon's shut in and sun shut out
And all the sea's a drifting shore,
Though tide-rips clout and put me about
And the lather of cross-slops crab my oar,
I'll sail her true and 'cordin' to;
—And oh, the foggy foggy dew!

Where were your eyes that day, young Jordan,
For the rocking rise, the glimming land-loom?
Where your ears, my gooding boy,
For the smalling seas that shift the shingle?
Where was your feel for a shoaling keel,
The shiver and shawling, yawing of doom?
Your grandfather knew, and so now you;
—And oh, the foggy foggy dew!

Your first grandfather first, young Jordan,
Old he that in his shipwrecked thirst
Sucked sea-fog off his aching lips
And sucked but caking salt—and slaking
Followed voices on the sea.
And then came you, now I askew;
—And oh, the foggy foggy dew!

Hear now, young Jordan, salt that you are,
Where was your dread and where now mine?
The trough and the surge, the urge of the dead,
These are our manna, salt for wine.
O heaven-swell, O passing-bell,
Hearing I know ye, all ye spell;
Hold me true in long haloo:
—And oh, the foggy foggy dew!

—R.P. Blackmur, Part II of "From Jordan's Delight"

The Journeyman Rejoices

Some irony out of the common mind,
some wisdom gathered, and returned, like night,
Saw half-united, half at odds, the blind
Conjunction in the name, Jordan's Delight.
What Jordan's that?—Some journeyman of despair
Lived here and died fishing foul weather fair.

And what delight?—Some bleak and gallant face,
Lonely in words, but under words at home,
Might look, might almost see, a first wind-trace,
What hardness rock and flower overcome.
It is the sea face that we hidden wear
So still, rises, rejoices, and is bare.

—R.P. Blackmur, part XI of "From Jordan's Delight"

prestigious journals of the day, including *Poetry* and *The New Republic*, and fellow poets hailed Blackmur's talent. Yvor Winters called him "one of the five best poets of his generation," and Allen Tate declared "From Jordan's Delight" "the best American poetry of the decade."

In writing about Jordans Delight, island historian McLane expresses the "frequent frustration" experienced by Maine coast researchers that "the persons after whom islands were named often do not appear in the title record." He goes on: "It would be interesting, for instance, to know who Jordan was — if only to share the whimsical satisfaction he took in his prize."

Blackmur, too, was intrigued by the name. "What Jordan's that?" he asks at one point in his island sequence, and answers, "Some journeyman of despair/[who] Lived here and died fishing foul weather fair." In turn, he populates the place with a jilted lover, a bearded fisherman, a King Lear figure and other individuals at home in exile.

The opening stanza of the title poem sets the stage:

What is that island, you say, stark and black —
A Cythera in northern exile? sung
Only by sailors on the darkward tack
Or till the channel buoy give safety tongue?
Here is no Eldorado on the wane:
New Sirens draw us in, in silent seine.

Blackmur's Maine island verse mixes mythological and classical references — like Cythera, Eldorado and the Sirens in the cited lines — with the specifics of local knowledge and language: tack, channel buoy, seine. In a footnote to another verse, he explains that the word "han" is "the Maine coast familiar form for heron."

Blackmur took pride in his grasp of downeast detail. He knew and respected the many weathers that shaped the environment. "Being weatherwise was his experience of the wisdom of God," a character muses in one of his short stories. British poet Denis Donoghue notes that the word "weather" may have been Blackmur's favorite. In truth, his evocations of the changing climes stand among his most powerful verse. Take this stanza from part III of From Jordan's Delight :

All's weather here and sure, visible change;
It is the permutation of the stone,
The inner crumbling of the mountain range,
Breathes in our ears sea rale and moan,
And this the steadied heart, our own, must bear:
Suncalm and stormcalm, both in breathless air.

McLane points out that Jordans Delight had "a single economic use: pasturage." Sheep were grazed on this and other islands in the area, a fact Blackmur knew of. Section I of "Sea Island Miscellany" pays tribute to this hardy breed:

The tough sea island sheep
towards dawn break up our sleep;
may they attend likewise
the death we do this day put off—
with the faint, fog-cracked cough
of half surprise.

Other sections of From Jordan's Delight are devoted to the island's flora: "Flowers do better here than peas and beans," Blackmur observes in part III. In part IV, his botanical observations get more specific: "Such is the red stonecrop/The purpling sea-pea/The blue legume with bluest bloom/And blue harebell/Laced in the fissured dripping rock." These details, writes Fraser, are "filtered through the eye of Saint Francis in his Canticle of the Sun, and through the ear of Milton in Lycidas."

Shakespeare, Ezra Pound, W. B. Yeats and T. S. Eliot also influenced Blackmur's verse. His penchant for inverting phrases and the decidedly old-fashioned flavor of his language often lend an Elizabethan air to the poetry. The poem "The Foggy Foggy Dew" has the rhythm of a sea chantey, such as were collected in the area by Fannie Eckstorm and Mary Smyth in *Minstrelsy of Maine* (1937).

From Pound, Blackmur gained a love of myth and image, from Yeats, an objective eye. In his introduction to the collected poems, Denis Donoghue writes that "Language, to Blackmur, meant the possibility of a poem: words were meanings, but also provocations, hints, invitations."

Blackmur's somewhat dark, "modern" regard for the world owes something to Eliot, who spent his early years on the coast of New England. Fraser describes Blackmur's meeting with Eliot when Eliot was teaching at Harvard. "They talked American politics," he recounts, "and about sailing on the Maine coast — the tide rip off Petit Manan, the harbor at Roque Island, the Jonesport people, the thrushes through the fog on Casco Bay."

The Blackmurs went their separate ways in 1950. "From the day of the divorce," writes Fraser, "the good place in Maine was lost to Richard irretrievably, and he lived in felt exile the last fifteen years of his life." On a brighter note, Fraser asserts that Blackmur's experience of Maine "was permanent . . . his road to Damascus: he became a convert and was saved."

The Maine-born painter Marsden Hartley once wrote, "We are subjects of our nativeness, and are at all times happily subject to it." For Blackmur, that sense of nativeness was inextricably linked to the coast of Maine. "The tidal waters and islands of the Maine coast meant for Richard what Aran meant for John Synge," concludes Fraser. "In his love affair with Maine, he shed himself and discovered an identity."

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Sea-Odalisque

East of the eastern ledge a hundred yards
the haddock feed on rising tides, and there
I choose a round warm room, walled in fog,
and let my dory anchor go. I hear
only Nash's Island's friendly signal bell
and sometimes, distant, from Petit Manan,
a lonely horn dying out, lost, and dull,
creeping along the waters under the fog.
Though I have fish enough for chowder, still
the oars lie straight and quiet along the thwarts,
and likewise I. There is no hurry on this sea.
Languorous kelp and seaweed drift me by,
three porpoises whirl up their flukes astern,
a seal emerges from the grey ground swell,
regards me slowly, slowly submarines.
The boat makes slowly north and south, slowly
rises from trough to crest, as slowly settles.
This is the lulling of a lullaby.

The tide of hours comes to its full, and I
wonder why men abuse their flesh with mermaids,
image sea-nymphs and such like fictive things.
There is the sea herself, her long low swell,
in my own room, spreading her lazy thighs.

—R.P. Blackmur, Part X of "Sea Island Miscellany"

Mirage

The wind was in another country, and
the day had gathered to its heart of noon
the sum of silence, heat, and stricken time.
Not a ripple spread. The sea mirrored
perfectly all the nothing in the sky.
We had to walk about to keep our eyes
from seeing nothing, and our hearts from stopping
at nothing. Then most suddenly we saw
horizon on horizon lifting up
out of the sea's edge a shining mountain
sun-yellow and sea-green; against it surf
flung spray and spume into the miles of sky.
Somebody said mirage, and it was gone,
but there I have been living ever since.

—R.P. Blackmur, Part IX of "Sea Island Miscellany"

("Mirage" is one of Blackmur's most "celebrated" poems, writes his biographer Fraser. According to the poet, "Mirage" was based on "an actual mirage on a very hot, quiet day on an island in the Gulf of Maine"—CL)

Eye of the RAVEN

(continued from page 7)

Satellite imagery clearly shows us that the single most important ecological engine for the islands and bays of Maine is an area of "upwelling" seawater off the southern shores of Grand Manan Island near the mouth of the Bay of Fundy. There, nutrient-rich bottom waters that have surged in through the deep channel of Northeast Passage and over Browns Bank turn southwesterly along the eastern Maine coast. The dense plankton bloom can be seen from sensors in space, and looks like a rich green pasture, "trailing clouds of glory" (or at least productivity and assorted larvae) southward along the coast at least as far as Muscongus Bay — more than a hundred miles down current.

The effort to acquire more satellite data for the region got a huge boost after Senator Olympia Snowe set up a meeting for us in Washington with Bob Feden of the National Environmental Satellite Data Information Service (NESDIS), a division of the National Oceanic and Atmospheric Administration (NOAA). This branch of NOAA receives data, at an ever-accelerating rate, from NASA and other government satellites, and is responsible for distributing them to other agencies. The richness of detail and the sheer volume of new imagery being downloaded and racing across Internet wires to desktops here and elsewhere are astonishing. This part of the much heralded "information superhighway" gives substance, for the first time, to the hope that the constantly changing marine environment can be seen and understood in "real time."

After several months of planning meetings and site visits, NOAA awarded the Institute a large contract to coordinate a precedent-setting effort involving nine different state agencies and research institutions (with 13 individual participants) to collaborate on an intensive study of the marine ecology of Penobscot Bay. The project will demonstrate the application of new marine science technologies to the problems of managing the diversity of our marine resources.

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In an effort to deepen our understanding of the ecological dynamics of the marine environment that affect species abundance along the island-studded bays of Maine, we plan to make a passage eastward in RAVEN, to run up the nutrient and plankton gradient all the way to its source, and once there, traverse the Grand Manan upwelling.

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August 25, 1996: Peter Ralston swings RAVEN's high bow in a slow arc past the small float at the north end of Vinalhaven to pick my field assistant, Sam Conkling, 12, and me for the passage eastward. Aboard is able-bodied seawoman Meredith Ralston, also 12, and this is the third pre-Labor Day expedition along the archipelago with these field assistants.

The day is a mixture of ghostly pale fogginess, broken by an occasional window of blue on white-rimmed spruce shores as we steam across East Penobscot, Jericho, Blue Hill and Frenchman Bays. We pass south of Schoodic Island and head for the long treacherous finger of Petit Manan where three eastern Maine bays — Dyer, Pigeon Hill and Narraguagus — all roil together in a tidal frenzy into the southwesterly flowing coastal current and over a shoal extending two miles out from the tip of the peninsula. Today Petit Manan is obscured by a gauzy blanket of fog lying over the cold waters that cycle south from Grand Manan. Since we are headed up "inside," through Moosabec Reach rather than "outside" around Head Harbor Island, we put the helm over and steam up Narraguagus Bay, where at its northerly confluence, a small handful of Atlantic salmon still struggle upstream in the Narraguagus River — one of the last wild runs on the Atlantic Coast.

We travel past the transcendental shores of Flint Island near Cape Split, and down through Moosabec Reach on a flooding tide rushing us eastward. Navigating carefully buoy-to-buoy through the Reach, we finally make Great South Beach at Roque Island near high tide. Sam and Meredith fish for harbor pollock and do quite well, while Peter and I watch the long rays of a dying sunset fade far and slow into the deepening azure of the evening.

August 26, 1996: The day breaks fair again in what is arguably the most spectacularly scenic one-boat cove in eastern Maine. Because it's high water, we can squeak out the south side of the cove, and steam past Great and Little Spruce's wild outer shores, up underneath the lee of The Brothers and out beyond Libby Island. In the distance is Cross Island, where we are due to get a tour of the largest Atlantic salmon farm in Maine.

Cross Island is the beginning of the wild, unruly Bold Coast, an immense stretch running easterly from Cross toward West Quoddy Head. Earlier in the summer, we had been among many who paid tribute to Peggy Rockefeller, whose energy and passion led to the protection of over 20 miles of this coastline. The Bold Coast is a gift not for this century but for the next, when we will have run out of coastline. Western Head, Fairy Head, Boot Cove, Jim's Head — are but a few of the great treasures laid away accruing interest for the future. Someday a foot trail might wend its way eastward — all the way eastward — toward the eye of the morning, where the sun's blood-red orb rises out of the green mists of the sea.

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When we round up into Northwest Cove of Cross Island, Clayton Coffin, site manager for the Atlantic Salmon, Maine fish farm for the last seven years, greets us. He points out over the acres of salmon pens and reels off the dizzying figures that characterize this operation: a million fish under his care in 80 cages will be fed about eight tons of feed this morning by part of his crew, while others harvest 40,000 pounds of silvery fish from another pen to be processed, packed and shipped out of Bucks Harbor by yet another crew four miles away on the mainland. All this activity and the 75 full-time people employed by the company are overseen by Clayton's boss, Frank Gjerset, who we learn is on a trip to Trondheim, Norway, the epicenter of the global salmon aquaculture business.

With Coffin we follow one of the dense assortment of black plastic pipes that snake out over the water to one of the pens where a technician has pulled out a hand-held computer that looks like a cellular phone and punched in some instructions. Sounding like rain, pellets begin cascading through the pipes as the feeding machine stirs to action, mixing a specified amount of feed with a dose of air to blow them through the tubes to the pen. At the edge of the pen where the plastic pipe terminates, a spreader showers the feed out over the pen's circumference, sending the salmon into a feeding froth. As a result of their patience in fine-tuning the system, the farm has been able to approach an astonishing goal: a feed conversion ratio of 1:1, meaning one pound of feed converting to one pound of salmon — a that which would make Frank Perdue's heart skip a beat.

Despite these appearances, all is not well in the salmon industry in Maine. A petition to require the federal government to list Atlantic salmon as an endangered species directly threatens the survival of the industry because most of the farms in eastern Maine are located close to those rivers that support the remnants of the last wild runs of salmon on the East Coast of the United States. An endangered-species listing would almost certainly tilt the regulatory scales against commercial aquaculture production and toward protection of the wild runs as a national priority. Not surprisingly, Maine's governor and congressional delegation have viewed this development with alarm.

To make matters worse, many of the salmon farms in Cobscook Bay off Eastport and Lubec have just weathered two years of significant mortality — first from a bacterial attack, followed a year later by an infestation of sea lice, a small crustacean that attaches itself to the sides of penned salmon and chews away their flesh.

Perhaps by virtue of its outer island aspect, the salmon farm at Cross Island experienced no significant losses either to bacteria or sea lice attack. Now at least some of the leaders of the salmon industry, including Frank Gjerset, have begun to consider dispersing their sites more widely along the Maine coast in settings that are further offshore, requiring heavier pens and larger leased areas.

The Maine salmon industry is no longer a mom-and-pop kind of business; farms like those on Swan's Island are the exception in an industry that is quickly consolidating and vertically integrating. Today there are four or five large players in the Maine salmon industry and tomorrow there will likely be fewer.

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At the end of the day we retrace our course, back toward Beals Island where we are to meet with one of most respected island fishermen, Herman "Junior" Bachman. Junior, the founding president of the Downeast Lobsterman's Association, has been participating in Maine's effort to design local lobster management zones along the state's 7,000-mile-long saltwater coastline.

The new law that creates the mandate for local area management is an attempt to codify and provide structure for the successful, time-honored practices among Maine lobstermen: common-sense conservation principles applied in community territories, along with unique forms of limited entry that are locally refined and self-enforced.

The application of these principles of lobster management may not be the sole reason for the lobster industry's astonishing success, but neither can they be dismissed: during the past six or seven years, lobster harvests have approximately doubled in volume and more than doubled in value. In the coastal counties of Washington, Hancock, Knox and Lincoln, the leading economic indicator is the number of new pickup trucks parked at waterfront locations.

When Junior arrives, at the public landing in Jonesport we talk lobster politics over a cup of coffee in the pilothouse. Junior is in a tear over how the federal government is managing lobsters beyond Maine's three-mile territorial limit, where state authority ends and regulations promulgated by the National Marine Fisheries Service begin. Lobster scientists say that Maine's lobster resource is exploited at too close to its limit of sustainability and that so-called "fishing mortality" needs to be curtailed. Maybe yes and maybe no, depending on whom you ask, but most lobstermen we've asked say they are seeing an awful lot more small lobsters in their traps than ever before. What really has lobstermen stirred up, says Junior, is the way federal biologists and managers refuse to recognize the value of Maine's most important conservation rules, many of which have been developed by lobstermen in the first place.

The five-inch limit on taking "broodstock" lobsters, the release back to the sea of any females with eggs (marked with a V-notch in the tail), and an escape vent in all traps to reduce "ghost" fishing are measures that were developed and adopted by Maine lobstermen long before they were codified into law. If the federal managers are so fired up to make Maine lobstermen control their fishing inshore, asks Junior, why don't they impose these minimum regulations in the Gulf of Maine beyond the three-mile limit?

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August 27, 1996: We aim to cross the Fundy Channel on a passage from Jonesport to Seal Cove, Grand Manan, where we will meet our friends, Janice Harvey and David Coon. Since our course will take us within a few miles of Machias Seal Island, we decide to dogleg past its famed shores to see if any late nesting seabirds might still be in the vicinity. When we pass close to Machias Seal's outer shore, indeed the waters are full of puffins, the delayed cool season perhaps explaining their late presence in inshore waters before they head out to winter in the North Atlantic. The activity is so alluring that we round up under the lee of the lighthouse where a Canadian flag snaps smartly in the southwesterly breeze and pick up one of the beckoning mooring buoys.

We spread out our (Canadian) charts and are reminded that we are, in fact, still in U.S. waters, the flag flapping overhead notwithstanding. While the kids jig for mackerel, we watch three lobster boats spin in slow circles over gear while gulls swoop and dive for bait. When the boats come close enough, we see they are all from Cutler, their high "Novvie" bows characteristic of waters ruled by Fundy's powerful tides and immense fetch.

Outside of the little lee that swirls around our heavy mooring buoy, we plainly see the region's famed tide rips: standing waves mark the confluences of tidal energy surging back and forth into the basin of the Bay of Fundy, intersecting other, deeper currents of upwelling waters, where nutrients are stirred into a rich, nutritious soup. We are near the very spot where the upwelling arcs across the Fundy Channel and heads for the flank of the Maine coast. These rips are visible evidence of how the Gulf of Maine's productivity, including perhaps larvae from broodstock lobsters that concern Junior Bachman, spreads southwesterly along the embayments of Maine.

Here, where porpoises patrol the edges of tide rips, is a timeless scene, the reverie heightened by the realization that the wellspring of marine production that seeds the bays of Maine begins under Grand Manan's cliffs and connects the Fundy and Maine coasts more intricately than we ever imagined.

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Two hours later we steam into Seal Cove, the southernmost harbor on Grand Manan's eastern shore. Janice Harvey and her husband, David Coon, are paired vertebrae in the backbone of the Conservation Council of New Brunswick. Janice grew up on Grand Manan, one of three children of the manager of the island's herring packing plant. Although she now lives ashore near St. Andrews, the rest of her family still reside on Grand Manan and it is with Janice and her extended family that we will spend the next two days.

In the mysterious manner of the invisible island grapevine, Janice and David have been alerted to our arrival, and they appear at the wharf within minutes. We are soon spirited off on an evening tour of some of Grand Manan's most scenic spots. We end up at Castalia Marsh and beach between Seal Cove and Grand Harbor, a magnificently long, sloping beach revealed to its fullest extent by the receding tides. No matter how many times you've heard about Fundy's tides, when you see the full extent of their reach and drop, you feel like a Lilliputian and stare in disbelief at the size of the sleeping giant.

The following morning the harbor comes alive early, like any working harbor in Maine. Salmon aquaculture has become a very big business on Grand Manan, as elsewhere in New Brunswick and eastern Maine, and the feeding crews begin heading out to the pens at first light. A whole service industry has grown up on the island, building the barges that service the pens. The barges are a model of simplicity and efficiency, barely 30 feet long, with hydraulic winches to lift and load the feed, nets and fish that attend the business. This morning the barges are piled high with bags of feed for the salmon. A little later, a small sightseeing boat pulls in to the float to load passengers for the daily whale-watching expedition.

A little later we meet most of Janice's family, including her older sister, who is gearing up for the new school year at the island schoolhouse. Mancill Harvey, Janice's father, who began as a fisherman but then went to work in the herring packing plant now owned by Connors Brothers and rose to become its manager, is interested in our publication, *Working Waterfront*. We leave several copies at the house. Next-door we visit Eric Allaby, a talented marine archeologist who is now the representative to the provincial legislature for the district of Grand Manan and the Western Isles, including Campobello and Deer Island. Eric tells us of his efforts to find a conservation buyer for the scenic headlands overlooking Dark Harbor on the back side of Grand Manan, and we put this on our itinerary.

A little later we hike out to North Head, where an automated lighthouse has emotional purchase over the entrance to the harbor most residents and visitors first see when they arrive on the large ferry that crosses from Blacks Harbour. As in Maine and the rest of the United States, Canada's lighthouses have outlived the necessity of live-in keepers and though their lights still burn brightly, their keepers' houses are not being kept up. The head of the Canadian Coast Guard section concerned with lighthouses has already been in touch with Peter Ralston, having heard about the Institute's precedent-setting legislation to

transfer these historic structures to local towns and non-profit groups in Maine.

After lunch we head for the Grand Manan Museum, established when Alan Moses, a self taught island naturalist, donated his exquisite collection of mounted birds to start the collection. The unassuming-looking building is an absolute marvel of the splendor of the natural world of Grand Manan. Having been to scores of island museums, I cannot think of another that more eloquently tells the story of the natural and human history of an island community.

We return to the harbor for a dinner aboard RAVEN, and talk long into the night about a strategy for tying together the many watershed interests and activists along the rim of the Gulf of Maine. A Gulf of Maine Alliance is struggling to be born in our feverish August minds near the invisible and indivisible border between New England and New Brunswick.

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August 28, 1996: The following morning, our last before turning back to the west, we want to visit the small island community of White Head, about four miles east of Grand Manan, which Janice and David have mentioned during our stay. All the other small islands around Grand Manan have been depopulated, mostly during the present century. Only White Head survives as a year-round community of some 200, mostly dependent on fishing.

The day reveals a thickness of fog. We cast off after breakfast and poke our way easterly. The entrance to White Head Harbor is confusing on the radar; we can see from the chart that a breakwater marks the harbor entrance, but the eerie green images on the radar screen are abstract and opaque. After an hour of peering into a sightless murk, a huge bow looms up, luckily made fast to White Head's wharf, and soon we are alongside and glad of it.

The kids scale the huge slippery ladder two hours into the tide and survey what little of the shore can be seen. It's hard to get your bearings in a completely new place obscured behind thick curtains of fog, but soon a young fisherman strolls by and we strike up a conversation.

"You from Rockland?" he asks, looking down at RAVEN's stern, marked with her home port.

Yes, steamed here earlier in the week, we say, and admit we've never been here before.

"Rockland's where our herring go when the plants at Grand Manan and Black's Harbour are full. On the JACOB PIKE or the SENATOR NEAL."

Oh yes, we say, we know those boats. See them tied up regularly at the Rockland pier.

"How are the herring running up your way?" he asks.

Well, the lobstermen are very worried about bait supplies. How are the fishermen doing here?

"Lobster season won't start here till November," he says, "but I was out last night, poking around with the sonar and there's herring around. They'll come inshore, now that the seiners are all tied up. They got their quota. Now it's just a matter of time before the herring come to the weirs."

By way of further introduction, we give him copies of our recent issues of *Working Waterfront* and *Inter-Island News* while Sam and Meredith head up to the store at the head of the wharf. When they return, Peter and the kids decide to stretch their legs and explore while I transcribe some notes. Soon all aboard is quiet, but only for a bit. A few other fishermen arrive and ask for copies of the newspapers and after a polite exchange, head for the other end of the wharf, apparently appraising the cut of the journalistic jib.

When Peter returns an hour later he hastens me up the ladder and asks if I want to see the rest of the island. Peter is with the first fisherman, Brian Knight by name, who has rounded up his truck, loaded the kids and seems eager to show us around. Six houses are owned by Americans, people who only come summers, he tells us proudly. (Ooh, we think painfully, this is how the eastern frontier will get settled.)

Brian takes us past his new house, which he has built during the past year. The weir fishing has been good — very good — in recent years, he says. The thought is a comfort in a place where all the weirs are still named. One of the weirs on the back shore, known as the Mumps, caught a million dollars' worth of herring last year.

In fact, Brian tells us that quite a few of his high school classmates, sons of fishermen, who went off to college, are now returning to White Head Island to take up fishing. After four or five years ashore as junior executives making $30,000 (Canadian) a year, they're just scraping by. Meanwhile Brian's got a house, a boat with a license, a share in a weir and, to top it off, a new wife. From his bedroom at night, he says, he can sometimes hear the snuffling spouting of whales rolling in the surge of the giving and forgiving sea. Life, it seems, couldn't be better.

But there is a catch. Canada manages its groundfish and purse-seined herring fisheries strictly by a quota system that has been bitterly resisted by the cussedly independent New England fishermen. Every fishery in Canadian waters is divided up among a fixed number of fishermen set by the government, and you must therefore buy someone else's license to go fishing. Brian, for instance, bought his lobster license for $8,000 a half-dozen years ago. His classmates returning to the island four to five years later would have to spend $30,000 to buy a license. College was not just a waste of time, Brian implies, but an expensive one at that. The large seiner tied up at the wharf next to RAVEN has licenses worth upwards of $400,000 that the captain will sell off for his retirement. This is good for the captain, and maybe good for the fishery, but a system that creates a few wealthy fishermen and excludes nearly everyone else is not a particularly compelling community development model.

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The trip to the productive heart of the Gulf of Maine gives us much to think about for the long upwind leg home. It has underscored a few fundamental ecological truths: the transboundary stocks of cod, lobster and herring migrate back and forth across the waters of the Gulf of Maine without the slightest recognition of the location of the Hague Line. The upwelling current that stirs feed into the water column to sustain schools of herring that Brian will catch is the same that sends larval lobsters into eastern Maine. Clearly, our maritime communities on either side of the invisible international boundary share gifts from the sea as certainly as island communities in the Gulf of Maine share a common fate.

The visit to White Head has been particularly instructive. Canada's quota system appears to be a biological success, at least for fisheries like herring, lobster and scallops, which are thriving in Canada. There are important lessons to be learned from Canadian fisheries management that should not end at the border. But setting up a system that lets the government, in effect, choose who will be the big winners and losers in fishing communities where such quotas are imposed runs deeply against the egalitarian grain of New England's mostly small maritime communities.

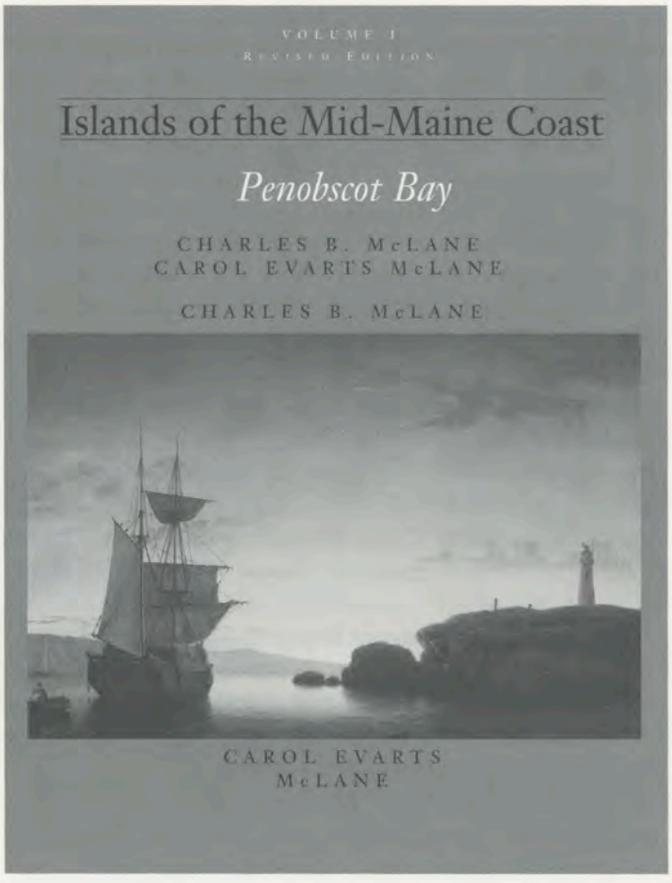
Nevertheless, the freedom to fish whenever and wherever and for whatever one wants cannot be sustained in the face of the kind of powerful technology that today is integral to the fishing business. Self-imposed limits, enforced by community sanction, are the only strategy that makes sense for managing Maine's marine resources. Groundfishermen, herring fishermen, scallopers and urchiners might well consider the experience of the Maine lobster industry, which has developed its own strong conservation ethic while maintaining a healthy and lucrative fishery. Community-based closures and locally enforced limits on gear within a boundary that extends further into the federal waters of Gulf of Maine may present a model for empowering New England fishermen to take control of their own fishing and futures. This model is based on the kind of common sense that applies to all island communities: without enough babies and youngsters, an island community has no future, either.

Reviews

Heroes and foolishness, heartbreak and hard work

Islands of the Mid-Maine Coast, Vol I. (Second Edition)
by Charles B. and Carol Evarts McLane
Tilbury House, Publushers, 1997

Reviewed by Edgar M. Boyd



Imagine two people of very different interests, say a landscape photographer and a geologist, scrambling over the same Maine island to follow their inclinations wherever they may lead. One will be drawn to the island's form and color and will take a broad view of the surroundings, while the other will scratch at the soil and become immersed in the particulars. Both of these people will appreciate their island visit, but in their own very individual way. Because islands can be enjoyed and understood on so many levels, visitors are often faced with this dilemma: just how does one comprehend the uniqueness of these places?

Charles B. McLane's *Islands of the Mid-Maine Coast: Penobscot And Blue Hill Bays*, when it was published by the Kennebec River Press in 1982, added a new perspective to our understanding of Maine islands. It presented statistics for almost all the islands in those two bays concerning property transfers, population censuses, and other important matters pertaining to human use and habitation. The social and economic histories that resulted tell us much about the lives of those who settled on them, lives that were disproportionately buffeted by the forces of nature, geography, human endeavor, and inevitable conflict. Not surprisingly, these stories are unique and often riveting, even for some of the smallest and most remote of islands. Adding the human dimension was that book's greatest accomplishment.

Charles McLane, a retired professor, but not a professional historian, began his island research out of casual curiosity. As a summer visitor to this area, and as an avid sailor in these waters, he often found himself wondering who might have lived on these islands, and who might have dug those stone-lined cellar holes. As it turned out, the histories of the islands in Penobscot and Blue Hill Bays were of particular interest to the reading public. On the strength of the reception to this first study, and because of his growing interest in islands elsewhere along the Maine coast, McLane went on to write three more books. They are, under the overall title *Islands of the Mid-Maine Coast*, as follows: Vol. II, *Mount Desert to Machias Bay*, 1989; Vol. III, *Muscongus Bay and Monhegan Island*, 1992; Vol. IV, *Pemaquid Point to the Kennebec River*, 1994.

While the first edition of the first volume encompassed some two dozen islands in Blue Hill Bay, these are omitted in the second edition because they were covered in a separate volume published in 1985 as Blue Hill Bay — in effect, a second edition of the Blue Hill portion of the original study.

The first edition has been out of print for several years, but there were other compelling reasons for McLane to undertake a revision of the first book, now referred to as Vol. I of the series. He and his wife, Carol Evarts McLane, who co-authored this second edition, have enlarged the scope so that it now includes some 250 islands in Penobscot Bay, including the larger islands: Isle au Haut, Matinicus, Deer Isle, Vinalhaven, North Haven, Islesboro and Swan's Island. Since the first edition, the two McLanes have travelled farther in the course of doing more research, probed more town records and historical societies and interacted with other scholars in the field of Maine's maritime history. They considered themselves better equipped as researchers, therefore, and more capable as historians and interpreters of the facts this time around. Regrettably, Carole McLane recently died and did not see this second edition reach publication.

While there were permanent settlements by the 1650s in such coastal regions as York, Casco Bay, and Damariscotta, there were none in Penobscot Bay, except at Pentagoet (Castine), until the 1760s, after the French and Indian Wars. The McLanes make the case that the incessant rivalry between England and France was particularly intense in the Penobscot Bay area, for here is

where claims based on Crown grants, early explorations, and alleged "settlement" were invariably overlapping. Island settlement could only begin in earnest once peace was established, therefore sometime after 1763.

During and immediatly after the Revolution conditions for settlement in Penobscot Bay were hardly more encouraging. Settlers were often divided among themselves; some were reluctant to join the war effort because they depended economically on Castine where there was a strong Loyalist presence, or perhaps because providing food or cordwood to passing British sloops proved to be one of the few avenues for profitable trade open to them at the time. Yet there were American privateers and their supporters operating in these same waters at the same time. Then, after the end of the Revolution, the continued presence of the British in Castine further confused the issue of loyalties, reopening the matter of Maine's eastern boundary and further discouraging island settlement.

In an effort to quiet the issue of ownership and make conditions more encouraging, the new Massachusetts state government commissioned a survey, the most reliable one to date, to include all the islands lying between the Penobscot and St Croix rivers. Completed by Rufus Putnam in 1785, it listed the island settlers, identifying some two hundred households on about three dozen islands from mid-Penobscot Bay to Machias Bay. All but 18 of these households were in Penobscot Bay, the greater percentage of them on Deer Isle and the Fox Islands. The Rufus Putnam survey is often the starting point for the McLanes' island profiles in this volume.

The settlers' means of livelihood on the islands was determined by an economic and ecological setting that was particularly precarious. Farming, quarrying and fishing all had their own requirements which could be met for a time, but then each of these occupations either ceased being feasible or required major changes to remain viable.

From the 1880s on, as the population figures show, the small and medium-sized islands, one by one, lost their permanent communities. We can see how it happened: how, island by island, the replacement of coastal transportation by railroads and the desire of families to stay together when teenage children went ashore to high school, spelled the end of year-round settlement.

The world of islands and islanders is different from that of the mainland, and the McLanes' revised study is one of the best resources available to learn and appreciate those differences and where they originated. This sort of "micro study" of settlers' social and economic lives is good history (when carefully done, as this is) and also, incidentally, reflects current trends in historiography.

It is not without shortcomings. As intriguing as the cellar holes are to island visitors today, just as intriguing are the shell middens and occasional flaked tools remaining from the era of Indian use of the islands, and about which too little is said. This omission is understandable considering the type of research conducted by the McLanes and the limited nature of their sources, but some better explanation to this effect is needed. Without a better summary, perhaps, of Indian use of the islands, the authors' approach seems slightly outmoded, somewhat like the more Euro-centric history of the past.

It also seems curious that as sailors the McLanes did not present the islands in the kind of sequence that might have been normal from a sailor's perspective: i.e., as you progress through a body of water, say Eggemoggin Reach, the islands both to the right and left would ideally be presented in the order in which they are seen. Instead, the order of presentation in the McLanes' book is first down one side of the Reach, then up the other. Of course the explanation for this is somewhat logical: the islands are "attached" to the mainland, say the Blue Hill mainland and the Deer Isle mainland, and both mainlands can not be discussed at the same time. Still, one wonders if it might not have been a more useful tool for the student of islands had the sequence been followed from the sailor's (or aviator's) perspective, for that is how they are most often seen.

There is always a fascination about viewing an island which appears today as little more than a quiet pastoral or forest setting devoid of any manifestations of human activity, knowing that at one time it was the scene of dense settlement and intense activity. Such is the case with many islands, even small ones, which were quarried at one time or another during the century after the Civil War. At least 35 such islands are covered in this book.

Another even more unusual example is Butter Island, one of the loveliest islands in Penobscot Bay. A colony at first called the New England Tent Club began to be organized there in 1896, starting out as a summer vacationland for pedigreed guests from Boston and other cities. The organization became more like a paying community of health and sport seekers, with strong emphasis on togetherness. "Dirigo," as the organizers came to call the island, could house up to 150 guests by the peak years from 1905 to 1910, most staying in the central pavilion, or Casino, while others lived in cottages of their own on leased or deeded land. Conveniences included a golf course, a separate club building where guests took their meals, tennis courts, a "yacht club" and a wharf where ferries made two stops daily. A round-trip steamer, which cost $5.50, left Boston at 5 pm and arrived at Dirigo, with a change at Rockland, at 7:00 am the next day.

Dirigo declined rapidly after the start of World War I, a victim of new coastal roads and reduced steamer and ferry runs which, by 1916, ended entirely — and in a broader sense, of "the changing times." By the end of the 1920s no buildings were left standing, and many of the fields eventually closed in. Today scant evidence exists of the former colony or its activities. As with so many other Maine islands, history tells much richer stories than the remaining evidence suggests.

There is some temptation to regard this book (and the other McLane-authored volumes in the series) as merely a curiosity — a worthy compendium of data about the islands, relevant for those who already have some knowledge of or interest in the islands. This could be very misleading, however. This second edition is a strong presentation of the social and economic history of a distinct and important region of Maine, and so deserves space on the

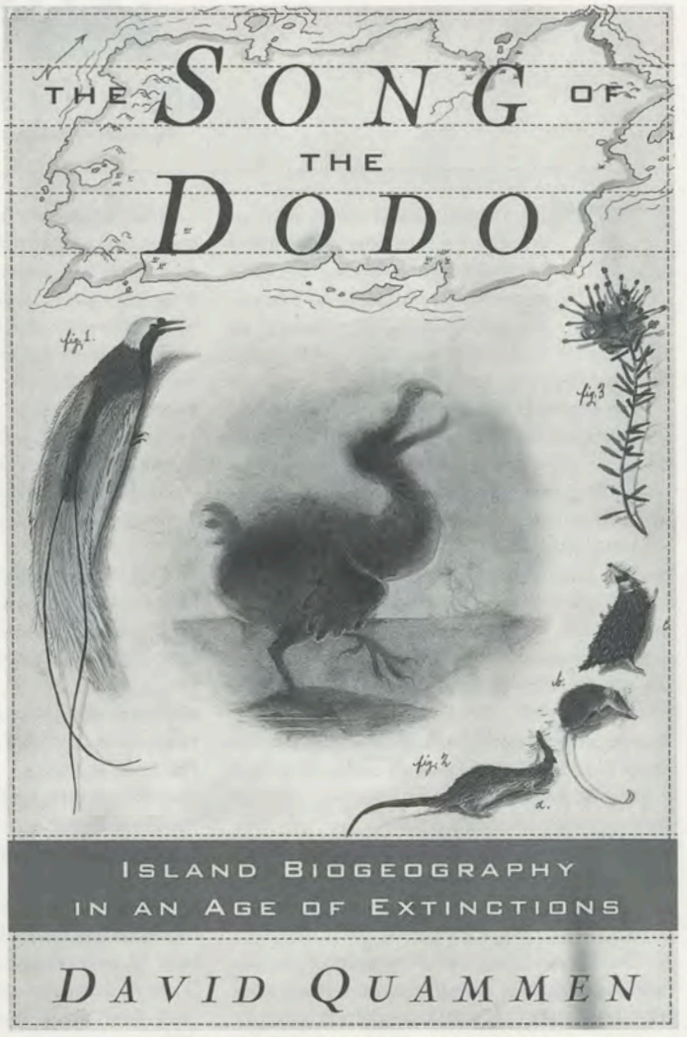
serious historian's shelf. The book is carefully researched and crafted. It is irreplaceable in that many of the primary sources — the human ones — are no longer available to researchers. The overall presentation, including the footnoting and the sourcing, is meant by the authors to encourage future research. This work illustrates the value of detailed research: one island study can contribute mightily to a better comprehension of the whole picture. This book should inspire future work in the field.

The casual reader with no pretensions to scholarly research or in-depth interest might read just the Preface, the Introduction ("Islands of Penobscot Bay in the Perspective of Local Maritime History") and the brief introductions to each of the groupings of islands. All are finely written and informative. What unfolds might be thought of as the maritime version of the frontier saga, complete with heroes and foolishness, heartbreak and hard work. In any case, the appeal of these selections should reach far beyond those who already have ties to the Maine islands.

The world in pieces

The Song of the Dodo: Island Biogeography in an Age of Extinctions
By David Quammen
New York: Scribner, 1996, 640 pages

Reviewed by David D. Platt



This is a very readable book about a complex subject. An articulate magazine writer with four novels and two other books of nonfiction to his credit, David Quammen gets right to the point on the first page of his first chapter: "Let's start indoors," he writes. "Let's start by imagining a fine Persian carpet and a hunting knife." The carpet should be twelve feet by eighteen; the knife must be razor sharp, "if not, we hone it." Merrily, he proceeds on his destructive way. "We set about cutting the carpet into thirty-six equal pieces, each one a rectangle, two feet by three. Never mind the hardwood floor. The severing fibers release small tweaky noises, like the muted yelps of outraged Persian weavers. Never mind the weavers. ..."

The Song of the Dodo delves deftly into the problem of what happens when we slice the world up into pieces similar to Quammen's imaginary carpet. Over a few hundred years a variety of birds, monkeys, tigers, insects and other things have disappeared as humans carved the Earth's forests, grasslands, deserts and other habitats into pieces: literally, islands.

Ever since Charles Darwin and Alfred Wallace sailed off to the Galapagos Islands and the Malay Peninsula in the mid-nineteenth century, evolutionary biologists have paid special attention to islands. The isolation and small size of islands, early researchers found, made species that lived on them particularly susceptible to decline and eventually, extinction. "Island biogeography" became a branch of biology dedicated to the study of island populations and what happened to them over time. Quammen considers the work of two dozen researchers in the field over a century and more, leading his readers to the conclusion that their studies of tigers, rodents, snakes, lizards, birds and other creatures collectively have as much to say about the world in general as they do about islands.

Central to Quammen's story is the work of Dr. Thomas E. Lovejoy, a tropical ecologist at the Smithsonian Institution who has spent years investigating what happens when an Amazon rain forest is cut into fragments. The result is "ecosystem decay" (Lovejoy's term): the disappearance of top predators and other species that require an unbroken forest canopy or a territory extending over hundreds of square miles. An undisturbed block of jungle, even a large one, in the midst of a clearcut; a section of forest cut by a road — both are, literally, islands and have therefore become subject to the forces that make island populations vulnerable. Cut off from the outside world, they are more easily destroyed by disease, a new predator, a series of dry seasons or further human disturbance.

Admittedly, *The Song of the Dodo* is science written for the lay reader. Quammen's breezy language and occasional anthropomorphizing can be off-putting. But like Charles Darwin's *Origin of Species* or Bill McKibben's *The End of Nature*, this book paints a picture of what is really happening out there. We can only hope Quammen's message hasn't come too late.

ISLAND INSTITUTE

Sustaining Islands and Their Communities

The Island Institute is a non-profit, membership-based organization founded in 1983 to serve the islands of Maine. Its mission statement speaks to the broad range of issues it addresses through its programs:

The Island Institute serves as a voice for the balanced future of Maine islands. We are guided by an island ethic which recognizes that the resources of the Maine islands and the waters of the Gulf of Maine are fragile and finite.

Along the Maine coast, the Island Institute plays a pivotal role in the dialogue about wise use of resources by positioning itself at the boundaries between competing interests; by developing solutions that balance the needs of the coast's cultural and natural communities; by supporting the islands' year-round communities; by conserving Maine's undeveloped islands in their natural state, and by monitoring and helping to protect the Gulf of Maine's natural systems, on which we all depend.

We carry out this mission through publications, education, community services, marine resources, and science and stewardship programs.

The Island Institute is the sole organization focusing its programs and resources wholly on Maine's islands, their people and the waters that surround them. Programs are for year-round islanders, fishermen, students and teachers, scientists and resource managers, summer residents, island property owners, coastal communities, state and municipal agencies, boat owners and island visitors.

The **Institute's Schools and Community Services** department helps island communities remain viable through:

- special economic development projects
- long-range planning
- information resources
- island schools (conferences, technical assistance, scholarships)
- legislative action

The **Science and Stewardship** department links island towns, property owners and state and federal resource agencies on a variety of issues, including:

- Tree Growth and Open Space tax laws
- solid waste regulations
- transportation
- water quality
- natural resource inventories and development of a comprehensive island database, including natural resource data collected from satellite imagery

The **Marine Resources** program provides information regarding the challenges and opportunities facing fisheries, aquaculture and working waterfronts. The program staff:

- collects critical marine habitat data
- monitors marine conservation legislation
- helps manage a groundfish stock enhancement effort
- helps manage a community-based salmon aquaculture operation

Through its **Publications** program, the Institute produces Island Journal as well as two bi-monthly newspapers, *Working Waterfront* and *Inter-Island News*. *Working Waterfront* addresses issues which directly affect people who depend on the coast and marine environment for their livelihoods, on the mainland as well as the islands of the Gulf of Maine. *Inter-Island News* is a community newspaper linking the 14 year-round island communities with each other and with seasonal property owners and other members of the Institute. Significant Institute publications over the years have included books such as *Penobscot: the Forest, River and Bay; From Cape Cod to the Bay of Fundy: An Environmental Atlas of the Gulf of Maine; Killick Stones*, a collection of island stories; Charles and Carol McLane's series on Islands of Maine; and Thomas Cabot's *Avelinda*, a memoir of one man's travels along the coast.

Conceived by the Institute in 1994 and signed into law by President Clinton in October of 1986, the **Maine Lights** program was created out of concern for preserving an endangered and important part of the Maine coast's cultural history. The program ensures that Maine's lighthouses find appropriate "caregivers" and remain accessible to the public. The Institute is helping to place lighthouse properties in the hands of non-profit, municipal and state government agencies. Potential recipients are screened by a federally-approved panel.

Fourteen percent of an approximate annual budget of $1.5 million comes from annual membership dues; 46 percent from membership donations; 32 percent from foundations and 8 percent from earned income (publications, conferences, consultations, etc.). The Institute does not generally receive state or federal funding. Our annual report, listing members and presenting the Institute's financial activities, is available to members, or upon request.

Membership participation from a variety of people is the only way to sustain a balanced organization, and we welcome your involvement in any capacity. Become a member — or call, write, or stop in to ask for further details regarding our island programs or how you can help through donations or volunteering.

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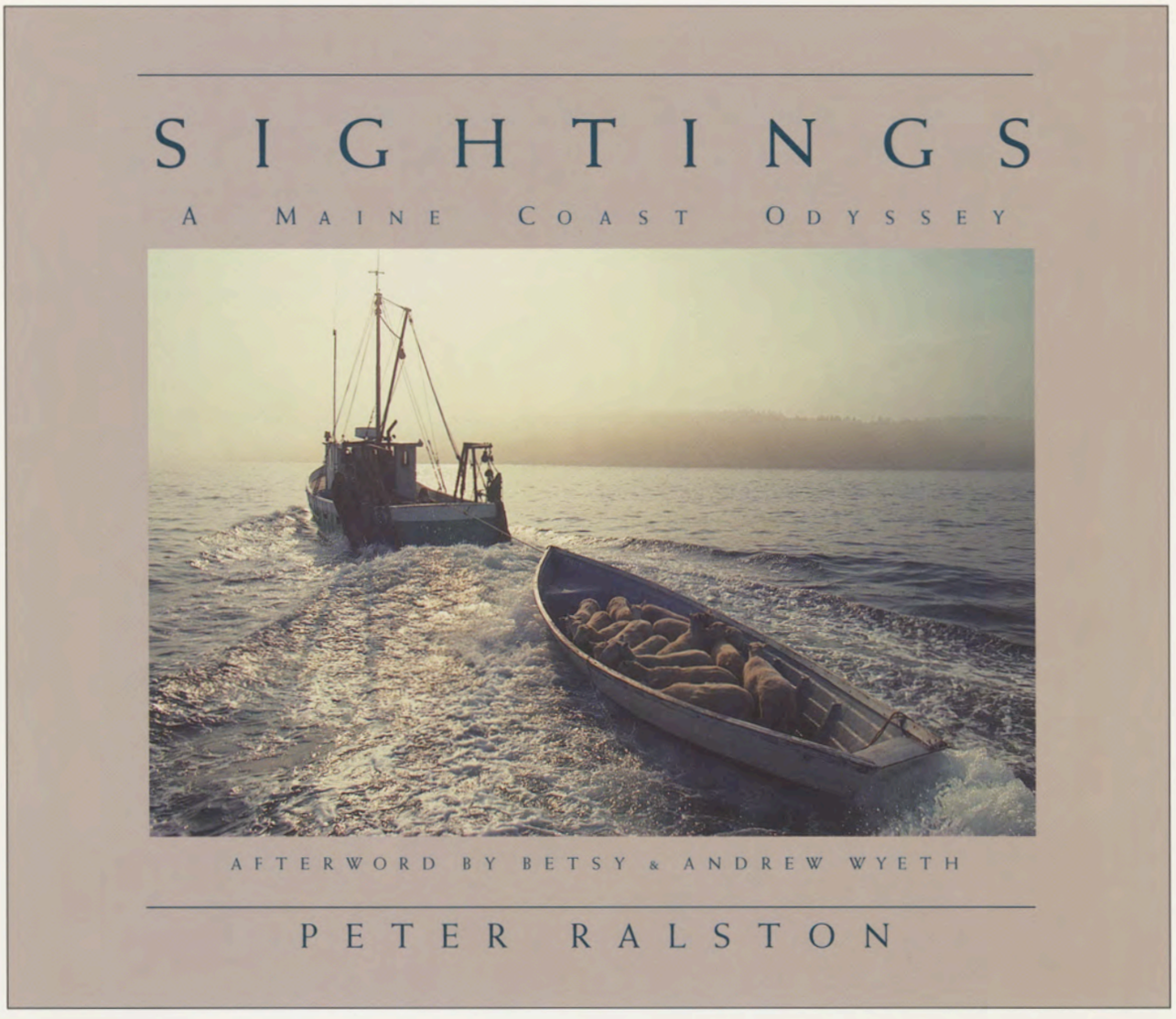
BOAT GIFTS

Over the years, our boat operations have been significantly enhanced by the occasional donation of vessels. These gifts have resulted either in boats we keep and use, or boats we convert into the funds necessary to run our existing fleet. Either way, we'd certainly like to hear from you if you should be in a position to consider such a gift.

PLANNED GIVING

Planned Giving is an increasingly important method of supporting non-profit organizations. Through proper planning, organizations are made stronger and donors receive substantial tax benefits. Call your attorney, financial advisor or the Island Institute's Development Office for more information on how you can support the Institute while financially benefiting yourself and your heirs. Whatever the size of your estate, you can leave a lasting legacy in support of Maine's islands and their communities.



Publication date: July 1, 1997

"Overall, we recognize a particular point of view, a seamless 'narrative' of time and tides. Ralston 'talks' about his island friends and takes us to places where few others would spend the time to read the human landscape, especially in winter. Most of all he tells of a continuing, vital relationship between work and nature and a communal life, on islands in particular, that is fast disappearing in most other regions. Islands may be the last places where self-reliance is coupled with a keen sense of community. That theme binds this book as tightly as a lobster boat to its mooring in a gale."

— from the introduction to Sightings *by Chris Crosman, Director, William A. Farnsworth Library and Art Museum*

"I have come to think of my photography as not unlike the art and science of fishing. Like my fishing friends I have spent countless long hours, often alone, often with nothing to show for a lot of work but a sense of having been there, having tried — going over the same ground again and again, sometimes surprised, occasionally coming back with a great catch to show for the ceaseless investment of what Melville referred to in *Moby Dick* as 'time, strength, cash, and patience.' "

— Peter Ralston

Copies of *Sightings* purchased through the Island Institute (see order card) will benefit the Institute's programs, and will be autographed by the author.

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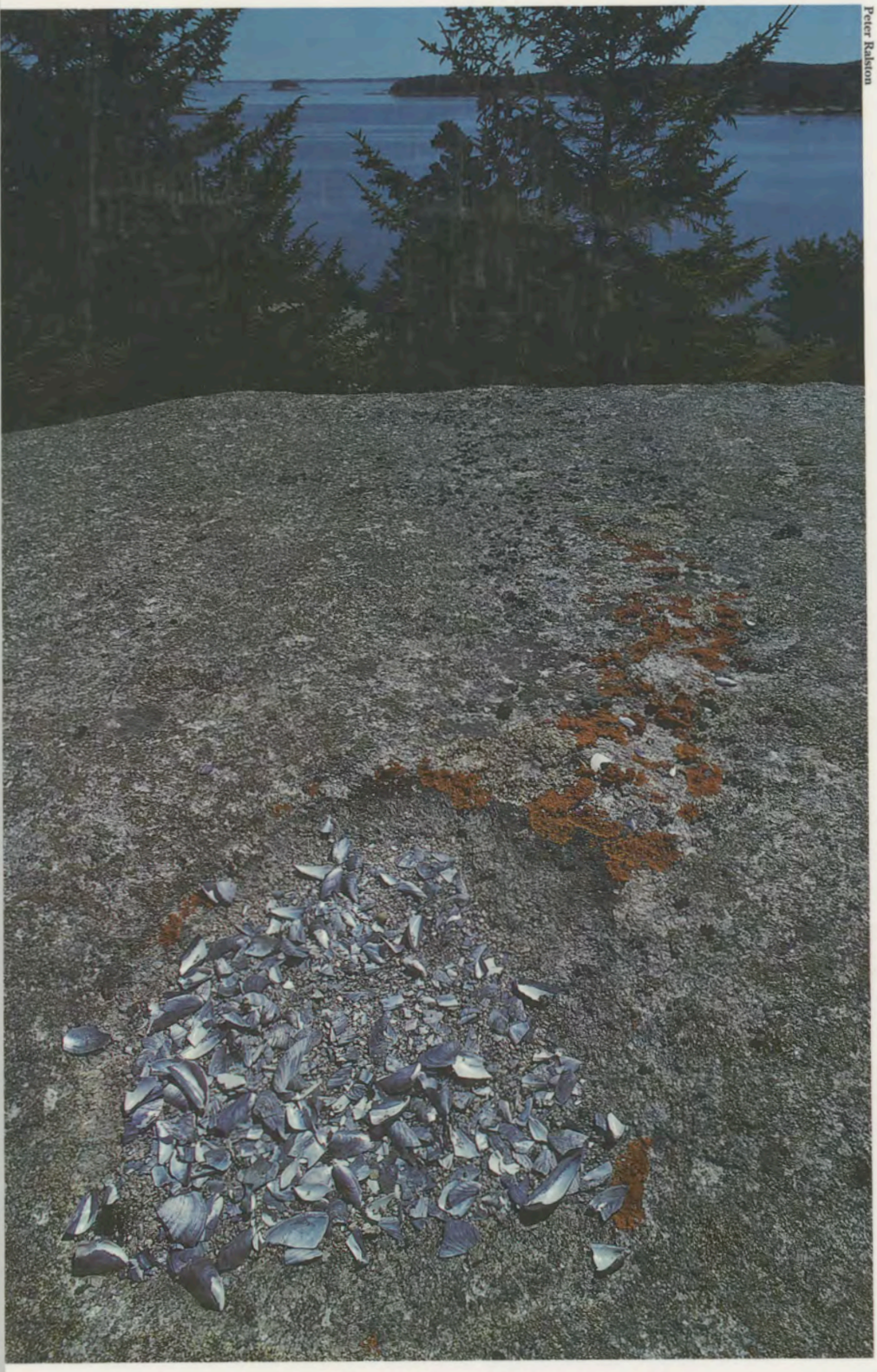

Peter Ralston

The Bowl

1
After the fight
with my mother-in-law,
I dream the bowl is broken:
the tub of the fortieth thief;
the jar of the wine of Cana;
the milk cup.
In the dream, I cry out:
"Save yourself,"
but the bowl cracks
in the firing,
the fault
nicking through,

2
A seagull builds a castle
in the air, hangs
to drop a mussel, a crab
down onto the rocks.
The shell snaps open,
and the body is unearthed.
The water is a bowl
patterned with the bodies
of my children,
who fish with their hands
on the bottom of Chandler's Cove
for the shard of blue.

3
From the pieces, from the wet hands
of my husband, his brother,
our sons and the nephew cousins —
deep divers, good swimmers —
my father-in-law has reassembled it.
Raised, intact, except for
one fragment, the bowl stands in his study.
Blue and white,
crazed, it is as old
as Crete, as water.
It will never be filled.

— *Sheila Jordan*

From *The China in the Sea*
Signal Books, 1995
With permission

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