

ESSAYS ON TIME AND PLACE: NEW ENGLAND

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Introduction

These essays are intended for casual reading by University of Connecticut students interested in geoscience. My hope is that they will supplement courses offered by the *Center for Integrated Geosciences* (CiG) at UConn, especially those in our beginning courses (Earth and Life Through Time; Geol 103, 105, 107).

Part I is a sequence of four stand-alone essays that tell the geological story of Connecticut from its bedrock beginning to its suburban present. **Part II** presents the argument that New England is a single coherent region unified by its geological history. **Part III** illustrates how different geological processes play themselves out over the landscape of woodlands, shoreline, and river towns.

I wrote these pieces over the past few years for a fairly restricted audience: readers of *Place*, a special commentary section of the Sunday *Hartford Courant*, the state's flagship daily. No more than two of the essays were reprinted elsewhere: the one on stone walls appeared in *The Boston Globe*, and the one on Plymouth Rock appeared in the Geological Society of America's national geology magazine, *GSA Today*. All essays are publicly available in various Internet bibliographical archives. They are reproduced here solely for convenience, and at or below the cost to print them.

Though I am the author and hold copyright, each essay was a team effort. At the newspaper, I thank Carolyn Lumsden and Tom Condon -- successive editors of *Place* -- and the rest of the staff. My home editor Kristine Thorson improved every draft of every essay. At UConn, David Bauman (media relations) and Raymond Joesten (Geosciences) were consistently encouraging. Thanks also to Abigail Howe at the *CiG* for making them available.

Part I – A Sense of Time

The four essays are arranged in sequence:

- ❑ *Making Connecticut* outlines the bedrock story of how southern New England came into being as an ancient mountain system welded to the edge of North America.
- ❑ *Glacier Gifts* describes the coming and going of the last large ice sheet, which created the physical landscape on which later human history would play itself out.
- ❑ *Losing Ground* describes the biological and human origin of the soil, and the forests and farms it supported.
- ❑ *Exit Ramp Culture* describes three episodes when humans spread over the landscape, culminating in the sprawl of today.

Making Connecticut

Architecture hasn't changed that much. The Roman architect Vitruvius defined this most complex of disciplines as the union of "firmness, commodity and delight." Using more familiar language, architecture strives to produce buildings and spaces that are structurally sound, useful and beautiful.

This trinity of criteria also applies to the Connecticut River lowland, the loaf-shaped valley embedded in the heart of our state.

In Connecticut's case, the first building material brought to the site was little more than sandy mud, caught up in a three-way tectonic collision between North America, Europe and Africa. In the process, the mud was forced deep within the Earth's crust, perhaps to a depth of fifteen miles, well beneath a mountain range of Himalayan proportions. There, the mud baked slowly under such high temperatures and such enormous pressures that the originally soft raw material metamorphosed into a crystalline solid, completely devoid of spaces. It is this pressure-baked material that comprises the bulk of the tenacious, light-colored rocks of the eastern and western highlands, where colossal fieldstones abound. Granite, gneiss, schist and quartzite are their names.

In contrast, the brown and barn-red rocks of the Connecticut River lowland were formed when the weather-beaten residues of these originally tough rocks washed together as layers of gravel, sand and mud that were later pressed tightly together, then even later cemented by rust, which accounts for their earthy hues. These are the familiar tilted layers of brownstone that peek out at us from roadcuts and excavations throughout the central valley, and which are proudly exhibited in landmark buildings all over the Northeast (for example, Hartford's Asylum Hill Congregational Church). The most famous "brownstone" of all, however, is a bedrock slab in Rocky Hill that -- in a successful architectural juxtaposition of material and form -- is carefully protected beneath an aluminum geodesic dome at Dinosaur State Park. There, the mica-laden mud contains dinosaur footprints called Eubrontes, Connecticut's state fossil.

The gathering point for these residues was a rift valley not unlike those of east Africa today, a generally dry place with turquoise-colored lakes, sandy rivers, marshy shores, rumbling earthquakes, steaming volcanoes and the shrieks and squawks of early dinosaurs. All of this took place some two hundred million years ago, when the Eubrontes track-maker, Dilophosaurus, a large, three-toed flesh-eating creature that walked on its hind legs, would have been free to stalk its prey not only across Rhode Island, but also straight into what is now southern Morocco. The Atlantic Ocean didn't yet exist. In its place was a tired mountain range already being thinned and stretched as the earth's plates, having reversed their direction, were beginning to tear the land apart.

One of the early breaks is now an escarpment, extending from Enfield to Haddam. There, the hard rocks ruptured along a fault, yielding a giant block that sank downward

into the earth's mantle. The block on which Hartford now sits dropped downward like the keystone of an arch whose sides were being pulled apart.

Then something critical happened. A new break formed to the east, between what are now Rhode Island and Morocco. There, the fault was deep enough to start a new ocean, which began as a narrow sea, then widened as it aged (like many of us). Meanwhile, the gathered layers of river and lake sediments from New Haven to Holyoke -- some infused with dinosaur footprints and the remains of ancient trees -- had sunk deep enough into the moist warm earth to become compacted and cemented into relatively weak, crumpled layers of red-brown rocks.

Since their formation, these softer rocks of the state's heartland have been less able to withstand the wear and tear of time (the exposure to the sun, wind and rain) than the harder rocks on either side of the valley. That same differential weakness was evident when the glacier slid south over New England, gouging, scraping, and rasping the lowland into an elongated basin. What had once been the highest part of New England had become its largest lowland, one big enough to capture runoff from Long Island to Quebec, and channel it past Hartford, where it flows strong and brown every year, especially during March, when northern snowmelt and warm spring rains coincide. The only high places in the lowland -- trap rock ridges such as Talcott and Avon mountains -- are the hard places, which are composed of cooled lava, rather than sandstone and shale.

The Connecticut River lowland meets all the criteria for architecture. It is structurally solid, having long since recovered from its earlier episode of rifting. It is useful, so much so that early 17th century scouts from Plymouth Plantation deemed it an agricultural Eden; three centuries later, the cities and transportation networks in the valley still testify to its utility. Finally, there is the beauty. Although blemished with urban blight and often undetected from the vantage point of an automobile, the enchantment of the valley can be seen from any long vista across it. At that scale, what passes for human architecture -- for better and for worse -- is subsumed by the work of earth's original architect, who worked long before the days of ancient Rome.

Granite from Branford. Brownstone from Portland. Marble from Kent. Traprock from lava ridges. Fieldstone from nearly everywhere. All of these stones have been plucked from their initial geological settings, brought to the heart of the state, and recycled by human architects into the beautiful buildings, monuments, walls and pathways of our everyday lives.

We live among ruins of an earlier age.

Jun 8, 2003. pg. C.4

Connecticut's Glacial Gifts

Some say the world will end in fire,

Some say in ice.

So said, Robert Frost, poet laureate of New England. Although Frost chose fire, he was sufficiently ambivalent to add:

... for destruction ice

Is also great

And would suffice.

As a professor of "ice-age" science, and as one who liked glaciers enough to get married beside one, I take issue with the poet's destructive view of ice. True, the passage of an ice sheet over a landscape does evict life, poets included. But the passage is only temporary and does not destroy the land.

In fact, the entire Connecticut landscape is a gift of the glacier.

Our safe harbors, historic mill sites and early farm economy were made possible by an ice sheet that oozed down from Canada between 25,000 and 15,000 years ago. The ice sheet also gave us fertile lowlands along our large rivers, gracefully curved upland pastures, gravel riffles in trout streams, verdant marshes fronting shoreline villages, a patchwork of stone walls, bricks for colonial buildings and solitary boulders, stranded here and there as if they were hillside shipwrecks. All of these are glacier gifts.

Yet it is Frost's notion of "ice-as-destroyer" that they teach in school. In this version, a jagged, mile-high cliff of brittle ice grinds its way to Long Island Sound. Stones are crushed in the shear zone between bedrock and black ice. Ledges are scoured by relentless pressure. Finally, the ice withdraws, leaving a scene of rocky desolation.

But there is another way to look at it.

The Connecticut River Valley -- the broadest, loamiest, most fertile stretch of agricultural land in New England -- is a glacial gift. Formerly the site of a tropical salt lake during the Jurassic period, this area was glacially deepened, then dammed to form a shallow, turbid lake whose shores shoaled with sand-moving waves. When it finally drained about 12,000 years ago, the stone-free bottom of the lake would become the

breadbasket of New England. Its clay-rich mud -- when mixed with sand, molded and fired in a kiln -- would become brick for building America, then and now.

Above the valley is the gift of green hillside pastures. These rolling hills remain lush -- even during late summer, the result of a layer of glacial hardpan immediately below the surface. This hardpan -- more properly called lodgment till -- was plastered onto the landscape by slowly moving ice. In the process, rock crevices were filled, rough outcroppings were swept away or buried and the land was smoothed into beautiful streamlined hills. Most important, the hardpan, being virtually impermeable, keeps the water of summer rains within reach of plant roots.

Farther downhill, water is filtered by its passage through aquifers created by meltwater streams. Having been rinsed free of mud, these masses of sand and gravel hold and release groundwater, steadying the flow of streams. Additionally, most colonial mills were located where this flow cascades over bedrock narrows, places that were plumbed by the flow of pressurized water beneath the ice. Industry in New England owes its hydropower beginnings to the glacier.

Stone walls, the signature landform of rural New England, are my favorite glacial gifts. Crisscrossing nearly every village and town, they were built as upland farmers rolled, dumped and stacked billions of glacial stones beneath wooden fences. During the last ice age, these stones were plucked from nearby ledges, spread over the land and dropped in place, just before the last ice melted. Farmers reversed the process, picking them up, scuttling them aside and concentrating them into walls, as if they were rebuilding what the ice had torn apart.

From Stonington to Greenwich, each of Connecticut's shoreline towns is located where an erosive tongue of glacier ice deepened an old river channel. Then, sea level rose, converting these rock channels into deepwater harbors behind ice-scoured hardrock headlands. The sand washing on those town beaches came largely from offshore patches of glacial sediment. The marshes behind the beaches developed as the pace of sea level rise slowed during the past few millennia (there was less ice left to melt on the globe).

The glaciers also left us with a grab bag of odds and ends.

Colossal boulders the size of cars (erratics) dot our towns; each was laid down gently as the ice thinned to zero. Stair-step benches in valley bottoms (kame terraces) show us where gravel-braided streams cut themselves downward, one notch at a time. Sinuous bouldery ridges (eskers) indicate places where tunnels beneath the ice became backfilled with gravel as the meltwater flow waned. Ponds and vernal pools mark places where blocks of ice, detached from the main mass, were buried by water-washed sand (kettles). Odd hills are often dunes, built when strong cold winds swept up a local surplus of glacial shoreline sand.

The most precious glacial gift of all is Long Island Sound. Its placid waters are protected behind Long Island, built during spasms of glacial dumping and thrusting at the

outermost edge of the ice sheet. This ice-pushed "moraine" barrier gave early settlers the extra dose of protection they needed to establish permanent footholds on otherwise hostile shores. In some ways, Connecticut is like a medieval castle, protected by the moat of Long Island Sound. The outer wall of that fortress -- Long Island -- should be ours as well, especially since it consists of crushed-up Connecticut.

Scientists now know that the world will end in fire. Approximately 5 billion years from now, Earth's sun will run out of nuclear fuel, expand into a red giant and hot-flash the Earth back into the vapor from which it was born. Until then, the worst hazards we face are urban blight, pollution, endless sprawl and the homogenization of the landscape by a species (*Homo sapiens*) no longer constrained by the use of natural materials.

Perhaps the solution to all our environmental woes is patience. If we wait long enough, Nature will send her ice sheet down from the north to erase what we have wrought in the name of progress, then restore the landscape to the way it looked when Adriaen Block first sailed up the Connecticut River. That scene was a gift of the glacier.

I end with my own version of Frost's poem:

Some say the world was made by fire.

Some say by ice.

For the most beautiful landscapes, however,

Ice suffices.

Aug 31, 2003. pg. C.4

Losing Ground

Cold hard cash. The almighty dollar. Market value. Money, money, money. What a lousy way to measure wealth. In his poem "Wealth," Ralph Waldo Emerson clearly identified the true source of riches in early America. It wasn't our great cod fishery, tall timber, animal pelts, whale oil or veins of gold. It was soil. Soil formed the basis of this country's early agricultural society. It provided the bread, butter, bacon and beer that nourished the militia that sent the British packing.

That resource -- the essence of terrestrial life -- was 15,000 years in the making. Only in the past half-century have we dramatically reversed its growth by covering it with America's favorite substance, bituminous pavement, the sine qua non of modern society.

From air the creeping centuries drew

The matted thicket low and wide,

This must the leaves of ages strew

The granite slab to clothe and hide,

Ere wheat can wave its golden pride.

Emerson knew that air and sun are the raw material for photosynthesis, as well as water from rain, snow and vapor. He knew that the leaves of plants drop to the ground and decompose. He knew that, over time, soil develops, thickens and eventually covers the granite crust of the earth. Only then can wheat -- his metaphor for the staff of life -- nourish humankind.

That process described by Emerson was the most important historical development in New England since the melting of the last ice sheet.

Cold dry air drained from the dome of leftover ice to the north. Melted snow and Atlantic rains soaked into an otherwise sterile soil, converting glacial grit to clay and rust. Pollen -- manna for microbes -- blew in from the south. Lichens encrusted the boulders. Mosses, sedges and ground-hugging grasses took root. Strewn dead leaves became food for other windswept plants, then for insects, worms and, eventually, every creeping thing.

Wave after wave of life followed, each contributing to the soil in its own way: tundra; coniferous taiga; deciduous forest; livestock pasture and tillage; then, finally, back to forest, which to this day spreads and thickens the soil.

First came a tidal wave of tundra that carpeted what the ice had wrought from stone. Shrubs of willow and birch -- resembling Japanese bonsai trees, or those forming the treeline on Mount Washington -- bravely weathered the harsh winds to anchor the soil, catching more dust. These trees also caught the rain, their roots creating pathways in the stone that allowed the water to seep beneath the surface and quicken the pace of soil development. Mammoths and mastodons drank from small ponds blue as the sky.

Next came a forested wave of spruce, fir, pine, hemlock and birch, separated by vistas of grass and sedge. Caribou and moose followed, followed by Paleo-Indians, human predators who roamed the landscape in search of game or harpooned marine mammals along the rocky coast. Many blue ponds turned to peat bogs covered by cranberries and tamarack.

Then a third soil-making wave rolled in with surge after surge of oak, beech, maple, ash, hickory, walnut, cherry, elm and others. The resulting soil, richer, helped to feed different woodland creatures - - beaver and deer -- along with cougars, bear and wolves. Rinsed free of glacial silt, streams sparked with spawning fish. About 9,000 years ago, archaic peoples moved in and stayed for millennia, leaving behind their seasonal camp sites, fishing gear and shell middens, most of which are now submerged. Many bogs became forested swamps, either blazed by red maple or crowned by Atlantic white cedar.

The fourth wave crept upward into rocky estuaries, not unlike those of today's Maine coast, creating wet soils ahead of the rising sea. Then, about 4,000 years ago, the sea slowed. Gray clam flats formed, as well as tan-colored beaches and green reedy marshes in bays and rivers kept free of trees by seasonally standing water. With this change came a new wave of humans, of Algonquin origin, who named their great rivers the Housatonic, the Connecticut, and the Quinebaug. Known archaeologically as the Woodland Indians, they gathered and hunted from seasonal riverside villages, stored food in chambers and made earthen pottery. Then, a few thousand years ago, they learned to till soil and grow crops on lands enriched by deposits of river silt.

The next wave of immigration came from across the Atlantic. Beginning with the Vikings at the turn of the 10th century, wooden ships began probing Connecticut's coast and its rivers. Then, during the four centuries after the arrival of the Pilgrims in 1620, there was an unbroken wave of exploration and immigration -- and exploitation of the soil that, for all their ingenuity and power, these settlers were unable to ruin.

At first, they drained and plowed the ribbons of marsh, converting them to square patches and strips. Hay, wheat, barley, oats and orchards replaced marsh and meadowland. Within a century, their descendants moved inland and uphill, felling the forests, replacing them with park-like pastures grazed not by ice age beasts, but by herds of cattle and sheep.

Next, in a spectacular reversal, most of these upland pastures, which had been cleared of stones for generations, were abandoned. Tens of thousands of New England sons and daughters walked away from the fields of their childhood for what they hoped would be a

better life somewhere else: the industrialized cities, the stone-free Midwest or the gold fields of California. The fields they abandoned filled first with wildflower weeds, then with oaks and pines in sandy pastures, beeches and maples in moister ones, and hemlocks in shady glens. The soil had survived in most places through it all.

Only within the last century -- only since we learned to inject fossil fuels into our engine veins -- have we been able to scrape and cover the soil to the point of no return. New England soil, it seems, has the power to recover from anything Nature can throw at it -- glaciation, dune-forming winds, hurricanes, meteorite impacts. Only we, it seems, have the power to do what nature cannot. Within the past half-century, we have covered the soil with bituminous pavement and other impervious surfaces faster than glacier may have paved the land with ice. In our rush to pave, we are destroying the true source of our wealth: the soil.

We won't starve as a region, even if we cover every inch. But there is a need to plan. Other than locally grown food, the principal crop for today's soil is trees. Collectively, the patchwork of parks, land trusts and undeveloped acreage produce what are called "ecosystem services." For the simple price of letting trees grow, they stabilize the land surface, reduce flooding, enhance recharge to our aquifers, recycle our airborne pollutants, moderate our climate, provide habitat for all kinds of creatures, and delight our senses with the sights, sounds and smells of lush forest.

With each acre of woodland lost, the state looks and feels more like an abandoned parking lot: hot and dry during summer, bitter windy-cold during winter, and always gray.

Now that's poverty.

Nov 9, 2003. pg. C.4

Exit Ramp Culture

Urban and regional planners have been wringing their hands over urban sprawl for nearly half a century. Perhaps because I moved here from Alaska, an enormously large place, it strikes me that New England is already sprawled to the max. What I mean is that you can live almost anywhere, grab a morning coffee, get on an interstate freeway and drive somewhere else to work.

Thus, for me, the question isn't sprawl itself, but how to rid ourselves of its byproduct, the exit-ramp culture created by the unholy trinity of the real estate industry, the mass merchandisers and the transportation bureaucracies, which treat each exit ramp as if it were a commercial teat on an endlessly long sow.

What's needed isn't sprawl control, but the political will to undo the ugliness, energy waste, ethnic unfairness and congestion, the hallmarks of the exit-ramp society. What we need are serious market incentives and a government strong enough to stand up to the carnage.

Sprawl has a negative connotation. Hence, I will hereafter use the word "spread." Homo sapiens spreads out over the landscape because we have a biological imperative to do so. Somewhere, deep in our evolutionary heritage, is a visceral craving for open space, whether it is a territory to hold and defend from encroachers or a patch of turf in which families can take root. The urge to spread is almost as strong as the urge to congregate in large groups, which, in the most extreme cases, culminates in the large cities found in every culture and on every continent. There is no instinct to build an exit ramp.

New England has spread three times. Each time, we have done so with good intentions and with a different view toward the land. Each time was also accompanied by the haphazard ugliness of sprawl, which is the downside of rural progress, regardless of historical era.

America's first episode of spread helped create our Jeffersonian "nation of farmers," each of whom wanted to carve his own little piece of heaven out of what was then wilderness. The image I conjure up in my mind is the Minuteman, the early American self-sufficient farmer, standing alone, plow on one side, flintlock rifle on the other, simultaneously husbanding and protecting a mini-kingdom surrounded by stone walls and rail fences. This image was to be found not in the shoreline cities, but in the rolling hills away from the coast, beneath which was a soil nearly perfect for grazing livestock, growing hay and tilling the soil. Almost anyone willing to clear the forest, move the stones and work hard could earn an honest living from the soil. So, young families spread themselves out over nearly the whole landscape, converting it from forest to farm. This was America's first imagined utopia.

But sprawl was there as well, something the visiting Europeans were quick to point out. Coming from lands with tidy villages that had been tilled for millenniums, they saw here an irregular patchwork of clearings, complete with stump fences, tottering stone walls and crooked lanes, the smell of manure and the sounds of livestock and their flies.

Beginning about 1825, however, and continuing for a century, the eyes of our culture shifted toward the industrializing cities, the American West and the Civil War battlefields. Even those young families who stood to inherit good farms simply walked away from them. Land was abandoned.

America's second episode of spread took place during the expansion of suburbs in the late 1940s and 1950s. Though the countryside beyond cities had already begun to be repopulated when automobiles became affordable, spread accelerated dramatically during the baby-boom years following World War II. Young middle-class families drove away from the cities to that idyllic land of kids running in packs through communities created not for working, but for sleeping, playing, going to school and worshipping.

Most of the commerce and the jobs remained in the cities or their perimeters. Gasoline was cheap. And by today's standards, housing was even cheaper because the land on which houses were being built had been abandoned and was virtually free for the taking. This was America's second imagined utopia.

Sprawl was there as well, often assuming the form of crowded housing developments just beyond the city lines, and cities beginning their long and precipitous decline. Commuting by car on roads first laid out as cow paths and cartways, led to traffic congestion of the sort that we now experience near county fairs, but with billboard ugliness inconceivable by today's standards. Highways between smaller cities were often bumper-to-bumper. The concept of "rush-hour" became compellingly clear.

America's third episode of spread skipped right over suburbia to the land of small rural towns lying within commuting distance of city jobs. This was greatly accelerated by the interstate highway system, of the 1960s and 1970s. Though designed principally for cross-country travel, the interstates made it so easy to get from place to place, that the land between town villages filled up with people commuting every which way, creating something called ruburbia. As suburbia engulfed more of ruburbia, and as the cities that spawned them both went into decline, the focus shifted to the exit ramps of the interstate highway systems, places generally devoid of history and almost wholly removed from civic affairs.

This time, sprawl struck with a vengeance. At important off ramps, enclosed shopping malls sprouted like glass and steel temples to materialism, each surrounded by moats of asphalt pavement for parking. At others exits, the malls were three-sided affairs surrounded by an ocean of parking, with an anchor store at one or both ends. Access-road restaurants, parasitic plazas, multiplex cinemas, and stand-alone superstores developed around the fringes of malls which slowly merged.

One can now get on almost any interstate within a metropolitan zone, take almost any exit ramp, and spend the entire day driving from one parking lot to another, all without entering a mall. A place with no parks, no historic architecture, no civic purpose, no museums, no sense of community ... nothing that might succor us beyond the goal of buying more for less. A place summed up by the statement "There is no there, there," as Gertrude Stein once said.

What next? More spread, of course. But hopefully with less sprawl, with much of the exit-ramp culture either done away with or cleaned up, and with the cities reinvigorated. Hopefully, this will be America's third imagined utopia, a place where we neither work the land for a living -- as we did in the days of the Minutemen -- nor merely live on it -- as we did in the early suburbs -- but instead, actually live with nature, listening to what it has to say, instead of listening to the cacophony of car-related things.

Go ahead. Call me a dreamy idealist. I acknowledge that we must face the real-world politics of urban renewal, fuel-efficient cars, mass transit, county-scale governments, and a broader cultural blend in human communities, and corporate telecommuting. But until that day comes, we will endure the death-by-a-thousand cuts of the exit-ramp culture, which unfolded somewhat accidentally during the age of easy oil, and the age of hyper-materialism, through which we have already passed, just in case you hadn't noticed.

Sep 12, 2004. pg. C.5

Part II – One Place

Three essays make the argument that New England is one place.

- *Red Sox Nation* argues that New York east of the Hudson River and Long Island are part of New England, and that this one state has Boston as its capital
- *There's No Place Like Home* comments on the geological stability of the region and its safety with respect to natural hazards.
- *These Stones Belong to You and Me* nominates drystone walls as the signature of the regional landscape, revealing much about its geology.

Red Sox Nation

Over the past two weeks, the Red Sox have proved something that geologists have known for some time: New England is one large state. Boston is its capital.

During this sports-besotted autumn spectacular, I discovered a one-to-one correlation between the geography of Red Sox Nation and the geology of New England.

It's not the case with Yankees fans and New York.

When I say New England is one state, I'm forced to face the reality of six state boundaries drawn on the map. But from my perspective as a Western immigrant, the state governments in New England are more like strong county governments. That's been my perception ever since I moved here 20 years ago from Alaska, where one of the counties (there known as boroughs) has more than twice the land area of the six New England states combined.

Having lived in Alaska, as well as California, Washington and Wisconsin, all of New England looks like one large geographically uniform and culturally rich place sandwiched between the sea and the sweep of spruce-birch forest extending from Vermont's Northeast Kingdom to the trackless woods of interior Maine. And all of this -- windswept mountains included -- curves around the Gulf of Maine like a half-eaten doughnut, with Boston on the inside of the curve.

New England has many geographies. There's political, cultural, historical, ecological and physical geography. But beneath it all lies geology. These two disciplines are often confused because they share the same first syllable, "geo," from the Latin word for earth. The differences lie in the later syllables: "logos," for the logic (science) of the earth, and "graph," for the spatial arrangement of things on its surface.

In the "logic" of earthly matters, New England is one place, thanks to the coherent pattern of rocks beneath the landscape that formed in the root of a single, very old, very beaten-up, ancient mountain system.

New England's western boundary is well defined as the long straight line of the Hudson Valley--Lake Champlain lowland. Its southern boundary is also well defined as the sandy island archipelago extending from Nantucket Island on the east to Staten Island on the west; it was here that the river-washed residues from

eroding highlands have been accumulating since before the dinosaurs. New England's northern boundary approximates the drainage divide between Canada's St. Lawrence River and the scallop-shaped Gulf of Maine, which extends as far south as Nantucket.

Only New England's northeastern boundary is arbitrary with respect to the landscape; it was drawn as the boundary between patriots supporting the cause of liberty and loyalists to the English crown who removed themselves to what are now the Canadian Maritimes.

Now, thanks to the Red Sox, nearly everyone knows that the coherent rock block called New England is mirrored by the coherent block of Boston fans who imagine Fenway Park as the center of the sports universe and who either live or used to live in cities and towns that lean toward the Gulf of Maine. As children, they drank water from the Kennebec, Saco, Merrimack, Charles, Blackstone, Thames, Connecticut and Housatanic river watersheds, all of which drain to the northeast Atlantic.

Only along the southwestern edge of this great region -- for example, in Fairfield County, the Litchfield Hills, and the Berkshires -- do we find a significant number of televisions tuned more often to the Yankees cable channel than to the New England Sports Network. This edge effect diminishes northward into Vermont, which, even prior to the American Revolution, chose to align itself with the New England colonies rather than New York.

New York is a different place, as I am not the first to observe.

The city of New York is extraordinary, being strategically located at the junction between the mouth of the Hudson River the northern edge of the Atlantic coastal plain and the eastern tip of Long Island.

But the state of New York is one of the most physically arbitrary places on earth. To a geologist, the Empire State is a chimera: separate geographic fragments attached to a central city as if they were iron scraps drawn to a powerful city-sized magnet. First to be drawn in was the Hudson Valley, which is, geologically speaking, part of New England. To the east, Long Island's sandy glacial moraines have greater affinity with Cape Cod and Martha's Vineyard than to the city.

To the northwest is New York's agricultural heartland, much of which could pass for Ohio in a blind taste test because it, too, lies over soft flat, layered rocks not that different from those in the Grand Canyon. The south central part of the state looks an awful lot like Pennsylvania's accordion-folded Appalachian ridge and valley province. To the far west, Buffalo-Niagara is a Great Lakes port, part of the

recovering rustbelt that also includes Cleveland and Detroit. New York is a land of many places, rather than one.

In contrast, New England is geologically unified landscape with a fringe of sand along its southern margin.

Since New England looks and feels like a single state, should it become, de jure, a single state? I'm not a political scientist, but I suspect that would be a hard sell.

We have these atomized governments -- 169 towns in a state as small as Connecticut -- because European settlers planted deep historic roots before the West opened up. The largely Republican notion of state's rights found out West is simply a larger version of New England's emphasis on town rights.

New England political "states" mattered most during initial colonization. Town governments mattered most during the era of horse- and-buggy travel. But neither scale makes much sense today when social, environmental and transportation problems are always regional, and when the regions don't align with arbitrary political boundaries.

So, perhaps sports fans will lead the way to a new regional consciousness.

The fact that the Red Sox are located in Boston is merely a quirk of history. Football fans root for an all-New England team, the Patriots, whose Foxboro stadium lies near the tri-state boundary of Rhode Island, Connecticut and Massachusetts.

If the Boston Red Sox went out of business (God forbid), and if a new major league baseball franchise were to be started today, I suspect that it, too, would be a regional team, perhaps with a central location. The absence of major league teams beyond Boston -- baseball, football, and basketball -- proves that the traditional New England states are really strong counties in a single state of rock and mind.

Oct 31, 2004. pg. C.5

There's No Place Like Home

The hymn "America the Beautiful" reminds us to appreciate the majesty of purple mountains and the immensity of ever-spacious skies. Southern New England has neither. Should we be disappointed? Not really. You see, there's a downside to the immense, staggering beauty that lies west of the Mississippi River: chronic exposure to life-threatening geological hazards.

Ever-spacious skies in the American heartland are breeding grounds for tornadoes, droughts and gully-washer floods. Thunderstorms there can be so severe that they make eastern soaks look like sprinkles. I recall the day in Rapid City, S.D., when I watched dead cattle and trailer homes floating downriver from Mount Rushmore. I remember the night in Utah when I slept in a cave because the all-night sandstorm was too loud for sleeping in the vans, which is where we fled after our tents were flattened. The bone-dry streambed of Hell Creek, Mont., is as hot and dry as it sounds.

Purple mountains are painted that way when a ray of light travels through enough sky to wash away the blue hues of overhead skies from the spectrum, moving them closer to the red of sunsets. Rugged highlands are maintained by tectonic movements that are inevitably accompanied by earthquakes, which rupture the ground and shake things up, especially loose rock. Purple mountains are precipitous as well. Their topographic relief, which so commands our aesthetic attention, is inevitably accompanied by debris avalanches, landslides and mudflows. Steep mountains are also rainmakers because they deflect air masses upward, cool them quickly and deluge the earth.

Southern New England lacks the raw emotional power of jagged mountains and endless horizons, but it has none of the bad things that come with such landscapes. It's a land of steady habits, physically speaking, benign but assured. Comfortable rather than dramatic; one bearing the stability and wisdom of antiquity rather than the fresh hope of youth.

But even New England was young once. During the Paleozoic, it was a lusty, lofty land of youthful exuberance, decorated by a high purple mountain system that extended from what is now New York City to the Canadian Maritimes, a range that has since deeply eroded. Our mountain home has long since aged away, leaving only the durable basement we live on today.

It's a Goldilocks sort of a place. Seldom too wet, seldom too dry, usually just

right. Though rugged and level in very specific settings, overall it's not too rugged and not too flat. Instead, it's hilly, with valleys and slopes to break up the monotony that comes with endlessly horizontal. There is room to breathe, but not so much as to make us feel insignificant. It's not too crowded nor too empty; a place where normal citizens can own their own patch of land and live on it too.

Southern New England may not be an ideal landscape for a vigorous young person in his 20s, when the call of the wild usually rates higher on a list of life priorities than a merely pleasant life. In my youth, I involuntarily floated in floodwaters. I got married on a volcano above a noisily crevassing glacier. My knees have wobbled during earthquakes. My life was spared by a rock avalanche. I lost a colleague on Mount St. Helens. I worked in a place where tsunami waves reached 1,700 feet above sea level.

I left such a life when I moved here from Alaska with wife and kids at age 32, at a time when stability and security, rather than excitement, rose to the top of my agenda.

Southern New England may suffer from pollution, blight, crime and boredom, things we have some control over. But we don't suffer from chronic fear of quicksand, landslides, seismic ruptures, drought, wildfires, flood inundations and the snap-down of entire forests by the wind. At worst, we have ice storms, which tend to snuff out the power grid rather than take human lives.

Volcanoes? Actually, New England used to have plenty of them, though none have been active for more than a hundred million years. This way, we get the benefits of volcanic rock -- stable foundations, nice vistas from trap rock ridges, a rich soil -- without the disadvantage of being smothered by ash, poisoned by gases or simply blown to bits.

Landslides? We hardly ever get them. And when they do occur, they are usually very localized and brought on by overzealous excavation into clay-rich soils or groundwater springs. Southern New England's immunity from widespread landslides derives from its fairly rigid hardpan subsoil, a glacial deposit pressed so hard onto the land that it is almost as tough as rock, sometimes tougher. It's stony, but very, very strong.

Droughts? There are patches of sandy soil that parch during the dry season, and gardens often do need watering. But most of New England has loamy soils that catch and hold on to water as if they were misers for moisture. Indeed, the rolling hillsides of New England stay green month after month. Elsewhere, water shortages can lead to international conflicts, financial ruin and urban violence. Here, we don't think about it much at all, even when our water managers plead for

conservation.

Floods? We get them, all right, but only infrequently, and they come with plenty of warning. The damage is costly, but brief. The land isn't destroyed, and very few lives are lost.

California may be richer than Connecticut in pizzazz and pinot, but it's a real loser with respect to geologic threats. Before the extinction of the geology department at the University of Connecticut, I took three or four cold phone calls from young women in California who had just been shaken up by the latest earthquake: Loma Prieta, Northridge, Palmdale...I forget. Each was looking for a place to live that was neither too flat nor too far from the sea, and that didn't experience damaging earthquakes. The callers were mothers with small children, perhaps arming themselves with information for the inevitable dinner conversation about moving back East. At one point I actually met a woman who had persuaded her husband to move back to New England to avoid their kids being crushed to death at school during an earthquake. She couldn't live with that possibility.

It's easy to appreciate the landscape drama that comes with purple mountains and spacious skies. It's harder to appreciate the tranquility of safe, productive land.

Apr 24, 2005. pg. C.5

These Stones Belong to You and Me

What would you do if an American cultural relic was being endangered? Would you look the other way as someone rough-handled the U.S. Constitution? Would you leave George Washington's portrait to be burned by the British? Would you toss Dorothy's ruby-red shoes into a musty closet?

No! You would place them under lock and key. You would guard them safely while simultaneously keeping them visible for all to see and appreciate.

New England's fabled stone walls belong in the same category as these American originals. The authentic, tumbled-down, lichen-crusted walls that crisscross every wooded village and town are also cultural relics. They legally belong to the individuals and government agencies with deeds to the property on which they rest. But they also belong to each and every citizen of America. They belong to you and me.

Two years ago, just before 9/11, we watched in horror as the Taliban in Afghanistan destroyed with bullets, mortars and missiles the giant Buddhas at Bamiyan, colossal statues hundreds of feet tall and carved in stone by the forgotten people of an earlier millennium. We didn't own those statues, nor are most of us Buddhist. Yet we were angered and saddened by the deliberate erasure of the cultural past. Why? Because those statues belonged not only to the Islamic zealots in power at that moment, but also to the entire world, which, the last time I checked, included you and me.

Something much less dramatic, yet far more insidious, is taking place in the woods of New England, sometimes under the cover of darkness. Abandoned stone walls are being bulldozed up, tossed into trucks and hauled away, often out of state to regional stone-supply and construction companies. Essentially, the landscape we see on our way to work, to school, to run errands or to visit friends is being strip-mined for its stone. Fieldstone is now such a valuable commodity for the construction industry that it is even being pilfered and poached along remote country roads. Trucking companies have actually used bulk mailings to solicit the sale of stone walls from residents of poor towns, offering cash in exchange for the right to haul them away. Left unsaid in these solicitations is that the properties denuded of stone walls will be devalued (and in my mind, degraded). Also left unsaid is that wealthy towns do not receive the same requests; their residents are less desperate for short-term cash.

Each time an old stone wall is taken down, we lose a cultural relic, one that cannot be regained when the wall is rebuilt somewhere else. Nor is a historic lighthouse regained when its stone is used to build a new one. The abandoned stone walls being torn down are not the signatures of an entitled few who signed the U.S. Constitution. Instead, they are the signatures of ordinary farm families who, acting together, built our nation. What right do we have to erase their signatures, just because they are too large to be placed under lock and key?

Imagine New England tourism without stone walls, especially in foliage season or after Christmas snows or during the daffodil days of spring. Imagine its forested ecosystem of chipmunks and ferns without the stone habitat. Imagine its children learning about early America without the lessons informed by stone walls.

There are laws against such unnecessary losses of natural resources as the indiscriminate cutting of old-growth trees, the export of soil, the encroachment of wetlands and the diversion of streams. Likewise, there ought to be a law against the thoughtless destruction of stone walls for nothing more than the stone they contain. Such a law would have to be simultaneously mindful of the property rights of individual property owners, the commercial needs of the landscaping industry and the right of all Americans to experience, viscerally, the stone ruins that so define the soul of New England.

Such laws and regulations do exist, although they cover only a tiny fraction of our stone "commons." Additionally, they usually recommend preservation rather than require it, and are piecemeal in their coverage. What is needed at this stage -- now that less than half of the original farmstead walls remain -- is to enact a strong statewide policy against the indiscriminate dismantling of our stone wall heritage, one accompanied by stiff penalties for wrongdoing.

Otherwise, the fabric of the landscape in which we live -- the patchwork quilt of abandoned farmsteads -- will unravel, one stone wall at a time.

Dec 1, 2002. pg. C.1

Part III – Special Places

Four essays were selected to illustrate different aspects of the New England environment and its geological processes.

- ❑ *Jailhouse Rock* is about the Pilgrim's legendary Plymouth Rock and its sad mistreatment through American History.
- ❑ *Cat Tales* concerns itself with the alleged repopulation of New England by cougars, otherwise known as mountain lions. This is cautionary tale about negative evidence.
- ❑ *Cheshire's Dark Underworld* concerns itself with New England's abandoned underground mines and the hazards they pose today.
- ❑ *The Tides of Time* deals with whale strandings and our fishery history.
- ❑ *Riverfront Reconsidered* is a case study of Hartford, Connecticut, which has been captured by the river (rather than the other way around).

Jailhouse Rock

Most of us have heard of the Society for the Prevention of Cruelty to Animals. But has anyone ever heard of the Society for the Prevention of Cruelty to Rocks? No, because it doesn't exist. Yet, that may be just what's needed in order to liberate Plymouth Rock from its ridiculous, ornate prison.

Contemporary pilgrims come from all over the world to see this memorial to our national beginnings. They come to see this glacier- dropped boulder that -- legend has it -- marks the spot where the first New Englanders stepped ashore in 1620. When they arrive, however, many are disappointed. This is partly because the boulder is dull gray in color and has the shape of a stepped-on potato. But the more important reason -- at least the one identified by my unscientific opinion survey -- is that the object of their pilgrimage lies in a pit, 10 to 20 feet below street level, a position that invites disrespect. Cigarette butts, bus ticket stubs, wads of chewing gum and coins -- most of them pennies -- litter this lowdown object.

Nearly 400 years ago, however, Plymouth Rock invited respect. To those who sailed in on the Mayflower, this sun-bleached granite boulder would have shone like a beacon on an otherwise low shore. To those who had just spent months on the storm-tossed Atlantic, it would have conveyed a genuine sense of hard-rock stability in an otherwise shifting world of rolling seas, swashing sand and flooded marsh, something even more firm than the English soil they had left behind.

I imagine a boatload of Pilgrims, rowing and wading ashore. I imagine them touching, patting and rubbing the rock, as if testing to make sure the North American continent was solid enough for their new home. Of course, we will never know if this actually happened, because their first thoughts went unrecorded. This, of course, is part of the magic.

Eventually, they built homes, gave thanks and went on to create the oldest English colony in the Northeast. As it grew, other objects began to dot the shoreline, diminishing the singularity of the boulder. The shore above high tide became a commercial street for merchant ships. Storms called nor'easters pounded the bank. Sea level crept slowly higher. Development encroached. The street was widened, then raised. A new wharf was built over the rock in 1741, and eventually the large boulder was just something in the way of progress. In 1774, a committee decided to save it for the future, something we can all be thankful for.

Heavy chains were threaded around the boulder. Oxen teams were called from nearby farms. A crowd gathered. Four-footed "tractors" strained to nudge the boulder out of its wet, sandy cradle. Instead of sliding forward, however, the boulder fell and was decapitated, its rounded top split from its buried bottom.

After considerable consternation, the top half was hauled to the town center where it was installed as a monument to Colonial success. The bottom half was buried by progress. Meanwhile, the top half of the boulder began to disappear. At first, chunks were quarried off for museum exhibits and souvenirs for civic leaders. It seemed as if everyone wanted a piece of the rock, which could be had with no more effort than whacking its edge with a hammer.

After who knows how many whacks, the village had no choice but to move the monument and protect it behind iron bars, to slow, if not stop, the rate of stone thievery.

So the beat-up half-boulder was loaded into a strong cart in 1834 and hauled to a more secure site fronting the Pilgrim Museum. Unfortunately, during transport, it slid off the cart and broke apart, once again.

Imagine the consternation, once again. Eventually a decision was made to unite what the glacier had brought to Plymouth in one piece. Its bottom half was "re-exposed" by peeling away the wharf above it. Meanwhile, the two remaining fragments were hauled back to the original site. Thus, in 1880, Plymouth Rock was "re-assembled," its pieces cemented back to the mother stone. Across the top they chiseled the date of 1620.

One irksome problem remained. The united icon of freedom still lay below street level in a pit resembling a bomb crater. The solution was to fence off the pit with another set of bars, then to build an ornate, open-air, stone building above the whole thing. Not being an architect, I think this edifice looks like an elegant mausoleum designed to exhibit the battered corpse of a stone potato.

Every Thanksgiving I express gratitude for the good intentions of Plymouth's town fathers. After all, they did save the rock. But I am not thankful for what strikes me as cruel treatment: decapitation by chains; hammering and chiseling; careless transportation; lousy patch job; deep inscription. Worst of all was imprisoning the stone in a permanent state of lowliness.

Four centuries later, I want to reach out and touch Plymouth Rock. I want to close my eyes and feel with my fingers what the Pilgrims must have felt. But the modern-day keepers of the stone -- the National Park Service -- won't let us. Nor will they raise America's most famous boulder to the position of respect it

deserves.

Until that day comes, I console myself by occasionally touching my own little piece of the rock, one that I didn't obtain by defacing this American shrine. You see, though the original Plymouth Rock is priceless as an artifact, as a material its practically worthless, being a plain-Jane, ho-hum, Billy-Bob, knockabout fragment of Dedham granite (the technical name for the bedrock south of Boston).

In other words, my piece of the rock is the little sister of the famous boulder, a chip off the same parent block. To get it, all I had to do was pick up a pebble from the shore of Cape Cod Bay. I keep my piece of the rock up high, on the mantel above the fireplace. Each Thanksgiving, I take it down reverently and put it on the table, right between the turkey and the cranberry sauce. Then, before I give thanks for everything, I pray that its big sister be set free.

Nov 23, 2003. pg. C.4

Cat Tales

Although the ample snow of last winter may have been a commuter's headache, it was just what we needed for resolving the cougar question.

The case for the presence of these large, tawny, long-tailed cats in Connecticut comes from sane, experienced individuals with little to gain but hope for a wilder world. The case against cougars comes from government officials vested with the public responsibility for fact-based wildlife management.

These groups rely on different kinds of evidence. Proponents cite eyewitness accounts, scat in the woods and ghostlike glimpses on video. Opponents cite negative evidence -- the absence of diagnostic tracks, of a roadkill cougar or of a deer carcass with the DNA of a puma.

The naysayers are right. Recall that December, January, February and even March gave us weekly doses of powdery fresh snowfall. Conditions were near-perfect for detecting cougar tracks. Yet none were reported. The failure to produce a single diagnostic track or body part under such perfect conditions greatly strengthens the argument against the existence of wild cougars in Connecticut.

But hope springs eternal. For millenniums, cougars had ranged widely in the Northeast, before European land-use patterns usurped their territory. Variouslly called mountain lions, cougars, panthers, pumas, catamounts and jaguars, these great cats were heard snarling in what Puritan leaders dubbed a "hideous and desolate wilderness." Soon they were being shot as "varmints," one by one, until 1881, when the last one (researchers think) was shot in Vermont.

Since then, large blocks of abandoned hilltop farms have reverted back to dense, closed-canopy woodlands. As the forest matured, other carnivores returned: bobcats, coyotes and bears, following their favorite prey, notably beaver, wild turkeys, white tail deer and human pets.

Are cougars among them? Almost certainly not.

The standard for using negative evidence is pretty low for creatures that are hard to hide. For example, to say there are no tyrannosaurs in the state is much more believable than to say there are no cougars, because the former were such enormous, loud, unafraid, daytime creatures. The standard of negative evidence for cougars is exceptionally high because they are so stealthy in habit, are camouflaged by their color, which resembles weather-beaten stone, can stand rock-still for hours and their broad padded feet muffle the sound of nocturnal

prowling. To this, we must add thousands of cases of mistaken identity.

The same exceptionally high standard for negative evidence applies to the most famous monster of all, from Loch Ness, Scotland. Conveniently, Nessie lives not on the daylight hillside farms, but in the darkest, deepest freshwater fjord in the British highlands. Conveniently, she surfaces only briefly on a lake whose physical properties (low-angled sunlight, temperature inversions, abrupt thermal gradients) give rise to optical illusions, and whose slow, oscillatory currents raise water-soaked logs from the deep, then drag them back down again. Conveniently, she resembles a creature -- a marine reptile called a plesiosaur -- whose remains have been positively identified. Conveniently, she is female, which runs against the cultural bias for the gender of monsters (Grendel's loving mother excepted).

The cases for cougars and Nessie live on, in spite of evidence to the contrary, not because we can't explain away their appearances, but because human hope always trumps reality. Otherwise, our casinos wouldn't be overflowing. Otherwise, families would give up hope for missing children. Hope, even for such hard-headed pragmatists as government wildlife managers, is essential.

Last winter's frequent snowfalls were, for me, the equivalent of draining Loch Ness and failing to find its most famous resident. With a territorial range of up to 70 square miles, there should have been millions of claw-free cougar prints in the snow.

None were found.

Jun 15, 2003. pg. C.5

Cheshire's Dark Underworld

What lies beneath? That's what worries Cheshire resident Mary Vosburgh.

A good-sized chunk of her backyard is being swallowed up by something that has already gobbled up truckloads of fill, dozens of old tires, a few old automobiles and even a children's swing set. In 1978, it took a bite out of Sheridan Drive, a street perpendicular to Mary's, which collapsed 20 feet overnight, curb to curb. In 1994, it drank up a stream. So worried is Mary that she plans to fence off the sinking section of her already fenced yard. Otherwise, her inquisitive, hole-digging terrier, Kimba, may become the next morsel.

Welcome to Cheshire, home of New England's deepest underground mines. Beneath the residential neighborhoods of Peck Mountain and Jinny Hill is a honeycomb of abandoned mine shafts, prospecting pits, tunnels and partially dug veins of barite, an unusually heavy, soft, snow-white mineral that, when crushed, resembles powdered sugar. Mixed with the barite are fragments of maroon sandstone, coatings of agate-like quartz and the greenish-blue tinge of copper, all of which fill giant fractures that once steamed with geothermal fluids and rumbled with seismic activity. For more than 50 years (1813-78), Yankee laborers and an imported colony of more than 200 miners from Cornwall, England, worked underground like so many elves. In that dimly lit local version of Middle Earth, they used pickaxes to hammer out the soft, beautiful ore; chains to hoist it up through vertical shafts; narrow-gauge tramways to move it to mine portals; sledges to crush it; oxcarts to haul it west to the Farmington Canal; barges to float it to New Haven for processing; and railroads to ship it to New York City. There, the ore was used to thicken the white paint still covering so many early American homes.

Written descriptions, especially those by long-time mining superintendent J. Lanyon and a consultant from Germany, Hermann Credner, indicate that the deepest shafts extended more than 600 feet, and that more than four miles of passageways lie beneath the otherwise pleasant town of Cheshire. These astonishing estimates make sense when one takes a closer look at the miles of nearby stone walls, many of which were built using leftover blocks of the polychrome ore that weren't rich enough to break apart.

The Cheshire barite mines were abandoned long before the present era of mine safety and environmental regulation. Hence, the abandoned shafts and tunnels were never filled; their supporting timbers having long since rotted away. As the tunnels cave downward, the voids migrate upward, until they reach the surface and

begin to swallow soil, one clump at a time, and surface streams that can now be heard (but not seen) trickling in the blackness. Water that entered the ground fresh seeps out somewhere else as mine drainage. Debris dumped in to fill the empty spaces slowly compacts and decomposes, reactivating the subsidence until more fill is needed, again and again.

The collapse is not completely random. Instead, it follows quasi-linear paths parallel to the mined-out veins and horizontal shafts below. One of these paths crosses an old basketball court in Mary's backyard, where the asphalt outlines a miniature rift valley 14 feet wide. Her neighbors tell of other strange tales: of sunken oak trees without visible roots; toppled cedars where surviving limbs became trunks; dank underground passageways complete with rotted door frames; a sequence of sinkholes opening like a zipper from east to west; random pits into which long poles can be inserted without touching bottom; an aboveground swimming pool built over a mine shaft, its water poised to flush down the drain should the earth decide to move abruptly.

Welcome to Cheshire, where town officials don't advertise their unique claim to fame. Mary grew up and went to public school in Cheshire, yet claims to have heard nothing about the town's colorful mining history in her social studies and science classes. After moving to Florida, she returned to buy a house on a lot that soon began to cave in. Rightfully, she wants to know why she wasn't informed about the potential for mine collapse by the town, the bank or the previous owner, especially since her lot lies on a line of sinkholes mapped by a now-defunct engineering consultant to the town. As a matter of public policy, Mary believes that everyone should be made aware of what is mostly an expensive annoyance, but one that is fully capable of swallowing an unsuspecting child.

What's needed is some sort of a "homeland security" act for Cheshire residents, one that would map out the abandoned mine workings, determine site-specific threats to safety and property, and put safeguards in place. Otherwise, the fates of residents will be left to chance encounters, to surface failures and drainage changes in places where people live and play, and where their underground utilities -- sewer, electricity, fuel lines -- are buried.

A good start would be to find the almost legendary map of the underground workings, which likely lies in someone's attic or engineering archive. Next would be a spelunking expedition to explore Cheshire's manmade caves.

There is a poignant irony in all this. During Mary's 11 years in Florida, she had reason to worry about sinkholes, a chronic and heavily regulated environmental problem in that soluble-limestone terrain. Moving back, she breathed a sigh of relief, knowing that she was returning to New England's ancient hard-rock terrain.

Imagine her chagrin when sinkholes began to take her property down the drain.
Imagine her outrage.

Jul 13, 2003. pg. C.4

The Tides of Time

Everybody loves whales, especially during summer vacation. Suddenly last summer, on the shores of Cape Cod Bay, there was an impromptu love-fest for whales. A pod of pilot whales beached themselves during the height of the tourist season, under picture-perfect azure-blue skies. Inexplicably, 50 of these creatures, which are closely related to porpoises in both size and genetic heritage, swam in from the deep to strand themselves on shallow sandbars at high tide.

Motivated by mammalian compassion, hundreds of humans -- residents, tourists, environmental managers, animal-rights activists, journalists and sundry do-gooders -- draped the beasts with towels to keep them wet, whispered encouraging remarks in their ears (which are hard to find), towed them offshore toward freedom and, in one of the saddest endings of the year, euthanized them with drug injections before hauling their dead bodies away.

These whales got more medical attention and a more dignified funeral than many humans do today. Not once did I hear about, or read about, thoughts from the other side of the environmental divide, the side in which whales are slaughtered with gusto. Not once on Cape Cod last summer did we hear the bell clang for a community-organized whale-meat barbecue (or, more erroneously, a fish fry), perhaps to complement the community clambakes taking place at the same time. Why not dip your lobster tail into a little whale oil, rather than into melted butter? More scientifically, why not dip your crustacean (the lobster family) into your cetacean (the scientific name for whales)? Having eaten raw whale blubber when I was younger and dumber, I know that the flavors would merge nicely on the palate.

We Americans have developed some amnesia about our past relationship with whales. Today, we bring our children to movies like "Flipper" and "Free Willy," yet we live in a country whose greatest literary novel, "Moby Dick," is about a whale that kills humans.

In the affluent town of Madison, in 1792, a company from Newport, R.I., set up a porpoise fishery that caught "more than six or seven hundred in a single season" -- in one instance "75 at a draught." Instead of being loved as fellow intelligent beings, cetaceans in those times were slaughtered "in order to convert them to good use: their skins for the fine leather needed for the bellows of blacksmith's forges; their oil (6 gallons each) for lighting; their carcasses for manure," by which the author of these words, David Field, meant fertilizer for crops.

I am not suggesting that we sharpen our harpoons. Nor do I suggest that we

weaken international laws protecting whales. Those laws, in my mind, are not strong enough. Instead, my purpose is to plant a notion in your minds, one that you can use when the situation warrants. Almost certainly, there will be a whale beaching this summer. Whenever and wherever it happens, I hope that you will use the opportunity to contemplate how far the United States has progressed with respect to protecting marine mammals.

Then I hope you use that sense of accomplishment to fuel progress in other areas. There was nothing inherently wrong or immoral about whaling and "porpoise fishing" in Herman Melville's New England. Nor is there anything wrong with an Inuit (Eskimo) family eating whale burgers for dinner. More locally, there is nothing wrong with lamenting the loss of beached whales today. Cultural context is everything.

Aug 24, 2003. pg. C.5

Riverfront Reconsidered

Riverfront Recapture? Who captured whom?

For many Hartford residents, the state-funded urban development by that name is a concrete wharf, re-establishing pedestrian access to the Connecticut River. The project was a great idea. The name, however, is little more than a lovely literary alliteration, with more illusion than allusion. Whatever committee approved the name Riverfront Recapture should have their heads examined, or perhaps take a geology course.

Mark Twain -- Hartford's most famous resident -- would have lampooned the namers of this project for their hubris writ large. Having seen the Mississippi River as "the majestic, the magnificent," Twain would have likely felt the same about the Connecticut River, New England's largest and steadiest.

During the late 19th century, Twain probably witnessed the construction of Hartford's 30-foot-high dikes, which were built to protect the then-thriving industrial city from damaging floods. He probably watched as the dikes cleaved downtown from its riverfront, its *raison d'être*. As an amateur river scientist, he may have taken satisfaction in watching the river finish off its capture of Hartford, rather than the other way around. Were Twain alive today, we might be quivering under his rapier-sharp pen.

Indeed, it is the river that has captured us. As T.S. Eliot wrote in "The Dry Salvages": "I do not know much about gods; but I think that the river/Is a strong brown god -- sullen, untamed and intractable."

The one good thing about Hartford's riverbank setting is that it could be worse. We could be living in New Orleans, Bangladesh or Venice, all of which are sinking beneath a rising sea. Hartford, however, lies on stable ground. Below the multicolored coat of urban fill, beneath the olive-colored skin of floodplain mud, lies the solid muscle of hard-packed glacial soils and rugged backbone of maroon-colored sandstone. But all this strength is helpless against the rising tide, which slowly grows higher, century after century.

The first inhabitants of Hartford were Native Americans, who camped on what was then a lovely river overlook near the confluence of the Park and Hockanum rivers. Later, as the Vikings settled Newfoundland, Indians of the Late Woodland Period grew corn on the floodplain, at the present site of Adriaen's Landing. We know this because the distinctive pollen of *Zea mays* (native corn; also called maize) lies trapped in the floodplain mud of that age, which was deposited whenever the river overtopped its banks, bringing with it an annual complement of moisture and mineral nutrients. This stimulated the luxurious growth of herbaceous vegetation and kept the forest at bay, producing a seasonal grassland perfect for livestock grazing and crops, yet with access to the river for water, transportation and the view. These floodplain soils were the bait that first lured European settlers to Hartford. They took the bait and became captured, as though they were fish on

a line.

The second capture was inevitable. As the settlement grew, the land just above the level of seasonal floods (then called freshets), but adjacent to it, became the most valuable, especially for commerce. It wasn't long before property owners realized that they could make more well-drained land by artificially raising the elevation of the floodplain with fill -- a mixture of gravel, demolished buildings, coal clinker and other debris. The stability of the fill gave the illusion of solidity and control, which led to the construction of expensive buildings and streets, the most famous of which is the Old State House. The financial investment alone captured Hartford on the floodplain, as though the city were chain-tethered to a place that occasionally went underwater.

The third and final capture was the ugliest. Too much money had been invested in downtown Hartford to tolerate the annoyance of rare floods. In an act of industrial hegemony, the Brahmins of Hartford took it upon themselves to tame the river with dikes, once and for all. Ironically, in the process of dike construction, one that Robert Frost might have lamented, the city walled itself in, as its dwellers walled the river out. Unwittingly, they had let themselves be captured by the river, not on a line and not on a chain, but in an open-air cage, however big it might appear.

My point? Any access to the riverfront is a good thing. Riverfront Recapture was a good start. Another three or four projects like that might be a good idea, although preferably with a less naive name. A break through the dike -- perhaps as part of a future Coltsville project -- would be even better. And given one break, why not another, and another?

Although it is my instinct to tear down the dikes completely, even if it involves some risk, this is clearly not in the state's best interest, because there is too much money invested already. Besides, doing so would snarl up traffic for at least a decade, given that I-91 cruises along on top of the dike (that's why you get to see the river from your car). The most logical -- although politically and financially absurd -- notion would be to raise the city to the level of the dikes (rather than lowering the level of the dikes to the city) and produce what an Old World archaeologist might call a "tell," should the city ever be abandoned and leveled.

The developers of Riverfront Recapture were absolutely correct in making the psychosocial connection between the long-term health of the city and access to the "strong brown god" that gave it life. It is this slightly vengeful god who, perhaps peeved by the temerity of the city clinging to its flank, broke the dikes in the great flood of 1936.

Meanwhile, sea level is rising. The river rises in refrain. Who will make the next break?

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