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Essays: Reflections on the Landscapes of Water

3

Aimée Brown Price: *Bellagio and the Villa
Serbelloni Gardens on Lake Como*

William deBuys: *Lava Falls: The Blood
of Aridland Civilization*

Elizabeth Barlow Rogers: *At the City's Edge:
The Past and Present Lives of New York's
Jamaica Bay*

Poetry

20

Barbara Ras: *Once the Ocean Takes You /
Why the Lake*

Place Maker

20

Paula Deitz: *Michael Van Valkenburgh
and the Design of Brooklyn Bridge Park*

Book Reviews

22

Peter Fergusson: *The Reformation of the
Landscape: Religion, Identity, and Memory
in Early Modern Britain and Ireland*
By Alexandra Walsham

Contributors

23



Letter from the Editor

It is impossible to think about landscape without thinking of water. Its presence is essential wherever there is life. Drought is a universal dread, desertification a serious danger, deprivation death. For this reason, reverence for water is genetically encoded in the human psyche. In both the Hebrew Bible and the Muslim Qur'an, paradise is a place from which four rivers flow. Many religious practices embody prayer for harvest-bringing rains; springs and grottoes were traditionally regarded as sacred; and fountains and pools offer delight in the cool, the sparkle, the placidity, the movement, the reflectivity of water. Not surprisingly, medieval, Mughal, Renaissance Italian, French baroque, English Romantic gardens and their successors everywhere use water for both metaphorical and pleasurable effect. However, our focus in this issue of *Site/Lines* is primarily on natural bodies of water – rivers, lakes, bays, and oceans – although we touch on matters of landscape design. In a section from his forth-

coming book *Climate Change and the Future of the American Southwest*, William deBuys takes us on a journey down the Colorado River through the boater's ultimate challenge, Lava Falls. But navigating the peril of the falls is more than a story of daring and skill. For deBuys, a noted conservationist, it is a metaphor for the pressing concern of global warming as humanity is carried ever closer to the brink of the most dangerous crisis facing world civilization since its inception: the drastic alteration of the climatic conditions that have shaped the development of human society. His message is urgent and clear: our point of entry into the rapids of climate change is one of the few things we can control.

Since antiquity, lakes have always attracted those who could build villas and summer homes on their shores. Nowhere is this more obvious than on Y-shaped Lake Como in northern Italy where the small town of Bellagio is situated on a peninsular promontory that forms the lake's crotch. From the vantage point of Villa Serbelloni, now the site of the Rockefeller Foundation Bellagio Center, a retreat for

scholars, artists, and policy makers, Aimée Brown Price writes about the beauty of the immediate environs.

On the eastern edge of New York City, between the southern end of Brooklyn and the Rockaway Peninsula, Jamaica Bay and its marshy islands constitute a wetland of great ecological richness. The bay's mosaic of estuarine marshes, however, was long viewed as so much waste space waiting to be claimed for such pressing urban needs as garbage dumps and airport runways. In *The Forests and Wetlands of New York City* (Little, Brown and Company, 1971), I devoted a chapter to Jamaica Bay and the creation of the wildlife refuge in its center. Wishing to assess on the fortieth anniversary of the publication of that book the changes that have occurred as a result of the then-nascent environmental movement, the incorporation of the bay into the Gateway National Recreation Area, and the city's continuing demand for landfill sites, sewage-treatment facilities, and space for commercial,

residential, and industrial development, I have written a new essay that highlights the ongoing tensions between these disparate forces. In large part, this is a story of two men whose lifelong attachment to Jamaica Bay gives them a unique perspective on it, both as a landscape to be protected and a place they call home.

Landscape architects have been engaged of late in a number of large-scale projects that take the form of parks and promenades along the water's edge. Michael van Valkenburgh has been particularly active in this area. In this issue of *Site/Lines*, Paula Deitz features his work and design philosophy within the context of his firm's new Brooklyn Bridge Park.

Perhaps only a poet can capture the mystical power that water exerts on the human senses and emotions. In "Once the Ocean Takes You" and "Why the Lake," two poems from her most recent book, *The Last Skin* (Penguin, 2010), Barbara Ras gives voice to our powerful affinity for bodies of water.

We are continuing to build our website as an educational resource. You will soon see that the page formerly called "Resources" has been named "Library." Here

you will find a continually updated, interactive, bibliography arranged in typological categories, covering landscapes from prehistory to the present. In addition, there are links to websites with content relevant to the study of landscape. Furthermore, there is information on how to access the Foundation for Landscape Studies' collection of over 5,000 landscape images on ARTstor, the nonprofit digital-image library for education and scholarship.

As a further exciting development, our online Foundation for Landscape Studies Library is where you will also be able to access an impressive collection of virtual rare books presented in the page-turning format pioneered by the British Library. For foreign-language volumes, there are pop-up translations of the text. Our first offering is the 1819 edition of *Magazijn van Tuin-sieraaden or Storehouse of Garden Ornaments* by Gijsbert Van Laar (1767–1820), a highly popular model book depicting various kinds of garden follies, sculpture, gates, bridges, and furniture. According to landscape his-

torian Vanessa Sellers, the translator and author of the companion essay, "No other book of this kind was published on the topic at the time, and no publication gives a better visual overview of what was a crucial and complex transitional moment in Dutch garden history." We invite you to turn the pages of this virtual book and enjoy its 190 engraved and hand-colored plates portraying faux hermitages, rustic huts, Chinese bridges, classical temples, and many other ornamental structures and sample layouts intended to inspire garden patrons and designers during the Romantic era.

Since we are a donor-supported biannual journal, we hope that you will make the continuation of *Site/Lines* and such initiatives as our ARTstor digital archive and new website presentation of rare books possible by sending a contribution in the envelope you will find inside this issue.

With good green wishes,



Elizabeth Barlow Rogers
President

On the Cover:

Lake Como, Bellagio, and the mountainous terrain beyond. Photograph by Ron Jenkins.

Reflections on the Landscapes of Water

Bellagio and the Villa Serbelloni Gardens on Lake Como

The Edenic lake district of Northern Italy has been esteemed since antiquity: sultry summers, in particular, are better spent in these sweet, aqueous surroundings amid the verdant foothills of the Alps than in downtown Rome. Not only privileged Italians but also their Austrian counterparts have long made this gloriously endowed region, with its fish-laden lakes and occasional mists and sudden rain squalls, a favored destination, and its history is filled with their complicated comings and goings. Of all the lakes of the region, Lake Como is considered the *ne plus ultra*. I offer the following appreciation of its paradisiacal setting and earthly delights from the perspective of an urbanite fortunate enough to have dallied near its shores.

For thousands of years now, villas have bordered this glistening, expansive Y-shaped lake, and many of their gardens still flourish on the deep-green, glacier-carved hills that encircle it. Pliny the Younger had two villas on Lake Como, *Comeodia* and *Tragoedia*. They stood in the upper reaches of Bellagio (the Roman *Larius*), still a beloved resort town. More recently, Liszt liked to dawdle lakeside at what Stendhal called one of the "*lieux enchanteurs*," and Flaubert observed that it would be a nice place to die. (Indeed, several wealthy Italian families, including the Gonzagas and Poldi Pezzolis, have chosen to build their family tombs and mausolea in this area.) But there has also been an American presence at this place of "beautiful ease" (a favored etymology for "Bellagio"); in the nineteenth century, Mark Twain and Longfellow sojourned here, and much of the twentieth-century narrative of the Como region is marked by American wealth. The beneficiaries in the past fifty years of this munificence include a new category of international visitor, often arriving from very far indeed: thanks to the Rockefeller Foundation, scholars and scientists, policy makers and writers, artists and composers from all over the world are offered a one-month stay at the Villa Serbelloni, their Bellagio Center. This past April, my husband and I were privileged to be among their number.

Our introduction to Lake Como was in the darkness of evening. "A necklace of villas" is how guidebooks describe the properties at the lake's perimeter, and at night, when their lights along the shoreline are reflected in the water below, a double-stranded necklace of glittering gems is just what they resemble. When we arrived, driving along the sparkling road-



Overlooking Lake Como and Bellagio.

bases, we were greeted by an unusual sign of spring: a mass migration of frogs – the onomatopoeic *rospos* (males) and *ranas* (females) braving at their peril a nocturnal journey from higher altitudes down to the water to reproduce. While many succeed (some with the aid of dedicated volunteers in reflector-studded greatcoats), others meet an ignoble end under the wheels of a Fiat or Ferrari. We were somewhat consoled by

ways that separate the lake from the surrounding mountains and curl around their

reaching the great gates of our destination, which opened to reveal cascades of flowers silhouetted by moonlight, expanses of meadow, an orchard and gardens waiting to be explored, and an ascent up a very long, curving driveway to the Villa Serbelloni itself, where we were to be happy, studious recluses.

The town of Bellagio, with its slanted, narrow streets and steep, cobbled walkways, seems to edge out into the lake itself. In early April it is already flush with flowers and tourists. Ivy climbs many buildings and leafy flowering plants are trained on wires to shade balconies and themselves become hanging gardens. Hip-high, pansy-filled stone flower boxes mark off the commercial roads and café perimeters, shielding shops and visitors from the one-lane traffic – cars, motorcycles, and

vespas squeezing through spaces meant at most for horse and carriage. The pollarded trees along the promenades near the lake burgeon with glossy, new, yellow-green leaves poking up out of gnarled gray whorls. Nestled in the back bays, away from the throngs of tourists, one finds the local residents who live in Bellagio year-round: the gardeners, the cobblers, the makers of hazelnut gelati and similar enticements, and the fishermen with their boats.

To reach the Villa Serbelloni, one skirts the center of town and climbs toward the promontory that forms the highest point of the municipality. There, perched high above the water, is the 53-acre enclave. The main part of the principal villa was built in 1540 and was originally surrounded by a farm (the estate nowadays includes other villas and structures); the Serbelloni family came into possession of the property in 1788. In 1929 it was sold to the Principessa della Torre e

Tasso, Ella Walker (1875-1959), of American origin, the thrice-married heir of the Johnny Walker whiskey fortune. If her portraits are to be trusted, she was quite attractive; she was also, according to local lore, gracious, charitable, and hospitable. Perhaps this is why, after the death of her Italian husband, she was allowed to keep her title, Her Very Serene Highness the Princess of the Holy Roman Empire Lady Ella della Torre e Tasso, Duchess of the Castle of Duino – but only through the special dispensation of Victor Manuel III. In the 1950s she offered the entire estate, along with a two-million-dollar endowment, to the Ford, Carnegie, and Rockefeller Foundations; only the Rockefeller Foundation bit. For the last fifty years, the property has been a study center for scholars and artists and a site for international conferences.

The terraces, balconies, and windows of the villa offer panoramic vistas. Both across the lake and nearer at hand one can make out great, stern villas with architectural accoutrements, interspersed in Bellagio with clusters of cubistic buildings stuccoed in ocher, blonde, salmon, rose, and persimmon, their tall windows accentuated by dark shutters ready to be closed at naptime against the light. In spring this panoply of colors enhances the sumptuous hues of the natural land-



scape: the silvery gray of olive trees; the verdant chartreuses, limes, and emeralds of shrubs and bushes; the almost black vertical shafts of Italian cypresses of the deepest green, for which this area is noted, needling toward the sky. Over 150 varieties of azaleas and rhododendrons, imports which first arrived in the nineteenth century, offer bursts of vivid pink, scarlet, crimson, pale violet, and maroon. Augmenting them are clumps of aromatic lavender wisterias, white camellias, and irises of deep-set purple. Far below, the sweep of lake and, beyond it, the more monochromatic, silhouetted ranks of mountain ranges, some still snow-covered, offer a serene visual reprieve from the cacophony of vibrant colors.

Whether it is really true that writers and artists need more thinking and breathing space than others is not certain. Oxygenation, supplemented with botanical and horticultural wonders, benefits us all, but secluded spots where uninterrupted concentration is possible are certainly crucial and richly provided here. Given the isolation necessary for serious scholarly undertakings and long, disciplined days of puzzling

The town of Bellagio at the lake's edge with the Villa Serbelloni and its gardens on the hillside above. Photograph by Ron Jenkins.

things out, the gardens serve not only as a delight, but as an energizing diversion – a reminder of the real, physical world at its best, and a reprieve

from sometimes draining mental and emotional focus.

The estate has two main sections – the lower gardens and upper park – that, through their contrasts, contribute to the splendid and exciting whole. The lower gardens, inviting and diverse, are on the slopes and terraced grounds below the main villa. They are a place apart, a private place for the visiting scholars, conferees, and guests. Near the lowest level of this section, bordering the lake and adjacent to a towered villa used as a conference center, are a gatehouse, a former chapel used for concerts, and a villa converted to studios. These structures are set among gently rolling meadows planted with low-lying shrubs and flowering bushes, the colors of the blooms and foliage set off by the dark bark of the neighboring trees.

One may make one's way to the main villa by way of footpaths, rambling moss-laced stone and concrete steps, a more direct staircase, or a gently ascending driveway. If mounting the hill on foot, one traverses an orchard of olives to get to the more manicured and edited zones of trimmed hedges, seasonal flora, and carefully tended exotica. Now ever-widening terraces begin to wrap around the promontory and afford a series of surprises: high topiary shrubs nearly encircling stone benches create intimate retreats; one outlying section reachable by a small path sports rows of well-tended geraniums adjoining a greenhouse; in another section, a gazebo near a steep drop yields breathtaking views of the lake far below. Wildflowers cling to the stony flanks of high grottoes.

Above these tiers and adjoining the main villa is a wider terrace with a fountain, tables, lawn, pebbled pathways, and an abundance of flowers, the latter all the more ravishing against the backdrop of the distant, snow-laced summits of the Alps. The lush camellia bushes sport bigger blossoms and glossier leaves than in other climes, and their flowers, not to mention the profusion of other seasonal blooms, are appreciated by the large, confident, hairy bees that go about their business with utter assurance. Yet the copious cascades of wisterias of early April, which hang with such glorious opulence over the balustrades and balconies and scent the air, become grayed blossoms by the end of the month – apparently done in by their heady display.

Far more rustic is the heavily wooded upper garden or “park” that extends from the main Serbelloni villa to the top of the property. With shrubs, wildflowers, thickets, and carpets of grasses, it deliberately seems unplanted. Spring here brings small violet- and periwinkle-colored flowers, radiant dandelions, and brilliantly aromatic, minuscule, yellow and white posies. The red berries of holly-like bushes appear, not quite as crimson as those on American Christmas wreathes, yet with the same scalloped, sharp-cornered leaves as their brethren. Though I am no horticulturist, the world of gastronomy is not unknown to me, and thus I can readily identify the fiddlehead ferns along the upper reaches of the park.

This rockier area of the promontory – encompassed by dirt and graveled paths, some edged with round rocks – is designed to look unmanicured, but is conveniently tamed. There are carved stone benches and a stone table for bucolic but civilized picnicking. Several tunnels cut through the upper slopes of the property, and the promontory is surmounted by the unexpected ruins of an ancient castle – the surprise a part of its appeal. Unlike the lower garden, this section may be visited on a scheduled tour, and some scholars and residents even play

tennis here, on a secluded court in the woods. But the quiet of the property is foremost (a bocce court was eliminated several years ago because the noise was said to distract conferees). The only notable sounds are the occasional call-and-response of birdsong and the church bells tolling at their own discreet, quarter-hour intervals.

The original owners and designers of the villa’s pleasure grounds could never have anticipated the eclectic crowd that now takes pleasure in them, and yet the options these gardens offer might be perceived as analogous to the choices that constantly confront the scholar or artist. A few paths traverse a hilly meadow: some are steeper but promise a quicker ascent; others are picturesque, meandering through inviting, unexplored areas; some lead through manicured hedgerows, the zigzagged routes satisfyingly channeled and expected. These may be metaphors for various methodologies: which motif to address or theme to take up; which will bear fruit and prove the most fertile. The scholar follows leads as well, and might leave the path to sniff a rare flower and gaze penetratingly at new growths – but while adventurously choosing less traveled paths, one may also lose one’s bearings and become disorient-

ed in an unfamiliar thicket of ideas.

The scholars gathered here are deliberately selected from a wide variety of disciplines and countries all over the world to interact with and play off one another. So, too, the flowers, some also imported from other parts of the globe, together form a richer and more engaging whole. Like the visitors and their projects, some specimens on the grounds make a grand first impression or take an unexpected form, dazzling in its brilliance; others, quieter and perhaps with smaller blossoms, make an impact more gradually, like the tiny flowers that scale old stone walls here. Other plants are pruned back, but not too far, so that there may be new growth and more luxuriant blooms.

Divagations in these remarkable gardens pique visitors to learn more about what they are seeing, strolling through, and smelling; after all, the Villa Serbelloni is a place for avid inquiry. Aging snapshots kept in scrapbooks in the villa’s spacious, tapestried study identify the carefully researched vegetation, flora, and wildflowers. Some labels are handwritten, other captions are typed, but it is clear that more than one guest became at least an amateur botanist after arriving. Hemlock and varieties of pine, birch, and beech; the holm oak and rare *Pinus montezumae* are to be found here. Of the plane trees that line the avenue, especially tall specimens are singled out for mention. The much-appreciated orchids with their bare stems are remarked upon, and equal note is made of more common species, which are categorized as “vulgaris.” Judgments are made about plants imported from other places (Chinese and Japanese trees are touted, other plants are not so fortunate); there is concern about invasive species taking over in locales that were not originally theirs.

This cunningly devised retreat – where everything is orchestrated to promote creative and intellectually rigorous work against a splendid natural backdrop – could not have been imagined even by the most brilliant among us. Yet there it is. Unfortunately, unlike the invasive horticultural species that have made themselves at home at the Villa Serbelloni, there is no chance for the human visitor to outstay his or her welcome: scholars may be housed here only twice in a lifetime. As such, it is not surprising that the spot has achieved an almost mythic status, like a Glocca Morra or Shangri-la – much desired, experienced all too briefly, often dreamt about nostalgically, but remembered always. – Aimée Brown Price

My thanks to Pilar Palacia, whose books on the Bellagio Center were a valuable source, and to Elena Ongania for additional data.



The Villa Serbelloni and a view of some of its gardens. Photograph by Ron Jenkins.

Lava Falls: The Blood of Aridland Civilization

The following essay is excerpted from A Great Aridness: Climate Change and the Future of the American Southwest, which Oxford University Press is publishing in the fall of 2012. The book examines the likely impacts of climate change on wildlife, forests, rangelands, cities, and especially water resources in a region where rising temperatures and changing weather patterns are already having profound effects. The chapter from which the excerpt is taken focuses on the Colorado River and Lake Mead, the vast reservoir behind Hoover Dam on which tens of millions of people depend for all or part of their water. Close analysis of the river's water budget shows that Lake Mead's risk of failure – of being drawn down to the point it cannot pass water through the dam – “skyrockets” after 2026.

Rightly or wrongly, everything challenging on a white-water river in North America gets compared to the booming rapid that culminates, in space, time, and difficulty, a river trip through the Grand Canyon. Say “Lava” to someone who has tasted whitewater anywhere, and the association to the Grand Canyon’s Lava Falls Rapid is automatic. A friend who guides trips on some of Alaska’s wildest rivers bristles when she hears the name Lava North applied to the most sphincter-tightening, life-or-death rapid on the mighty Alsek River. “It shows how Grand Canyon-centric the rafting world is,” she says. Advocates for other rivers say much the same. Still, Lava is the king, and the Colorado River, for which Lava is a mere riffle in its eons of canyon carving, is the most mythic of river kingdoms. If you have a weakness for wild rivers, eventually you float the Colorado, and eventually you make your way to the Grand Canyon and to Lava. The drop at Lava Falls is thirteen feet almost immediately, followed by fourteen more in a few hundred yards. At most water levels, Lava earns a difficulty rating of ten, on a scale of ten. It confronts you at mile 179 on the 226-mile voyage from Lees Ferry to Diamond Creek, an incomparable outdoor adventure. The trip has the shape of a well-crafted novel. It establishes its themes in the red-rock stillness of Marble Canyon. It tests its characters in the churning whitewater of the Inner Gorge. Then Lava comes exactly where a novelist would place the climax, about four-fifths of the way through the saga. All the way down the river, you have had Lava in the back of your mind. Everything that precedes it feels like lead-up. Everything that follows is coda, resolution, release, perhaps recovery. The crux of the tale, the defining moment, resides in the hurricane waters of Lava Falls.

By the time our small flotilla got there, we’d courted disaster at Crystal, dodged the rock horns of Horn Creek Rapid, ridden the roller coaster of Granite, and thrashed and crashed our way through scores of other rapids. Our baptism was long and wet, and it taught us that the river has many voices. We might have thought we knew them all, but we didn’t. Half a mile upstream from Lava, floating in the eerie calm of the slack water backed up by the falls, we heard a voice that was new and unexpected. It existed outside the range of the other voices of the river, a bass rumble at the lower limit of hearing. You felt as much as heard it. It was both majestic and menacing, like a naval bombardment on a faraway coast. Its vibration trembled in the tubes of the boat. The new folks turned a shade paler under their sunburns. The old hands, if they spoke at all, spoke in low tones. They had the set-jaw look of a rider about to get on a horse that’s known for nasty habits. We brought our paddleboat to shore on river right and trekked up a promontory of heat-soaked basalt to scout the rapid. At first the cauldron of froth and roar looked so chaotic I couldn’t make sense of it. Then the noise in my head, if not in my ears, quieted a bit, and I began to pick out its parts. On river left lay a maze of jagged rocks with no workable line through them. A left run would be possible only at higher water when most of those rocks were drowned. A center run, on the other hand,

was a worse idea. It would begin with a plunge into the maw of a giant hole, formed where the river pours over a series of basalt boulders – the remnants of a debris dam that once held back the entire river. If the hole did not flip us, the run would end instantly in collision with a wall of water the size of a mobile home. The standing wave would maytag our boat and all of us until every person and part came loose from everything else. Nothing would come out the way it went in. Not a good alternative.

The only feasible route began on river right, around the end of a long pour-over ledge. The trick for us would be to float down to the ledge, nip in under its right corner with a burst of velocity, and dig with our paddles for the center of the river. Then we’d slam into a big wave like a whale’s back just below the pour-over, and the collision would veer our boat downstream, aligning it (we hoped) to take on a massive V-wave more or less at its apex. The V-wave channels you into a convergence of water eruptions that blast you like fire hoses from all directions. It’s an orgy of aquatic fury, which one wit has called “the world’s biggest car wash.” At that point you put your head down, hold onto your breath and the boat, and try to keep your paddle from flying loose and remodeling your own nose or that of your neighbor. A lot of the rapid still lies ahead, but from there on, pretty much your only option is to

place your trust in dumb luck and chaos.

Our calculation, as we stood on the scouting rock, was a series of ifs: if we tucked in quickly under the ledge, if the whale-back wave turned us just so, and if we hit the V-wave close to the apex, then we just might punch through the ten-foot wave at the end of the car wash and be in position to paddle away from the house-sized boulder that loomed just past it. If we missed our entry, well, a lot of things could happen. It all came



Lava Falls Rapid, Grand Canyon, Arizona. Approaching the rapids of climate change, the main thing we can control, if we muster the will to do so, is our point of entry. Photograph by William deBuys.

down to having the right position, angle, and velocity at the outset.

You might say that the West, together with most of the rest of the world, is somewhere in the flat water above the rapids of global change. Not that we haven't already felt some of the early effects of an altered climate, but the big excitement lies ahead. Our trip through the hazards will be a first run, which is to say, we will have the benefit of no one else's experience. Still, enough good science exists to constitute a decent scouting. Looking downstream, for instance, we know that the Southwest will become hotter and drier, with greater extremes of both storm and drought. The increased aridity is assured by higher temperatures, even if precipitation does not decline, which it is likely to do. A greater proportion of that precipitation will come as rain, less as snow, and runoff from winter snowpack will peak roughly a month or so earlier than it used to. These are some of the big rocks and ledges we know about. Other hazards – waves of hyper-powerful forest fires, ecological die-offs, and dust storms – also lie downstream, but we are less sure where; we just know to look out for them. Additional and as yet unidentified dangers may also crowd our path, but their present invisibility could be just as well: if we seriously attend to what we already know, our hands and our agenda will be full enough.

Lester Snow, director of the California Department of Water Resources from 2004 to 2010 and later secretary of natural resources, thinks that scouting the rapids is part of his job as a public servant, and he has devoted considerable thought to his point of entry. He knows that not making a decision is a kind of decision, and given the length of time it takes to plan and build a reservoir, a pipeline or a flood-protection levee, the decisions taken or not taken today will ramify onward indefinitely. "I hate to use a clichéd phrase," he says, "but there is a tipping point somewhere [past which] you can't catch up, and if you don't make decisions now, you may have made a decision you can't recover from."

For purposes of future planning Snow and his staff are assuming a 40 percent reduction in Sierra Nevada snowpack by 2050 and engineering new levees and other water projects to accommodate a 55-inch rise in sea level. The current rate of sea level rise is about 3.3 millimeters per year, roughly double what it was for the majority of the twentieth century. It will likely continue to accelerate.

An increase in sea level will have immense impacts on California's inland waters as well as the coast. The San Francisco Bay and the deltas of the Sacramento and San Joaquin rivers comprise a vital nexus for the state's economy, environment, and hydrology. All of it lies within a few feet of sea

level. Flood hazards, endangered species, and other issues critical to agricultural and domestic water supplies converge there, affecting the fortunes and security of millions of people. Ignoring a probable rise in sea level is not an option. "There are numbers all over the place," Snow explains. "We just picked 55 inches. At the same time we are commissioning scientists to come up with a range that could either verify or undermine that target. At least when I pick a number, then I have given the engineers something that they can engineer." And adjusting to a revised number, if that becomes necessary, is a lot easier than starting from scratch. Compared to other states, California is moving forward decisively to grapple with the implications of climate change. It ought to. Its vulnerability to floods, especially along the Sacramento River, and the dependence of tens of millions of its people on fantastically elaborate water-supply systems make it vulnerable even to small shifts in existing conditions. The thought is counterintuitive, but in times of crisis, sloppiness is a kind of grace. Paring away at waste is always the first strategy for dealing with shortage. It's easy and produces fast results. Fix a leak and things get better. California, however, has been paring away at waste for a long time, and most of the easy work is already done. Although a certain amount of sloppiness remains, there's no longer enough of it to provide the flexibility and potential for rescue that twenty or thirty million people in a tight spot are likely to need. The Los Angeles metropolitan area, just for starters, is the largest desert conurbation in the world. It receives its water from a complex of aqueducts long enough to reach from southern California to Rapid City, South Dakota. Every drop of that water, you might say, is filtered through a web of contracts and agreements that requires an army of lawyers to defend. One bad day in court and the consequences can be devastating. The fact that faucets in Malibu flow with snowmelt mixed from the Wind River Mountains of Wyoming, the Colorado Rockies, and both sides of the Sierra Nevada is a daily miracle. The tighter and tauter the system, the harder it is to keep delivering the miracles.

Miracles also abound in Phoenix, Las Vegas, Tucson, and Denver, even to the point that molecules of H₂O from the same Colorado snowdrift that slakes LA's thirst may similarly appear in those precincts. The re-plumbing of the rivers of the American West, especially the brawny Colorado, makes daily marvels of water delivery not just possible but imperative. The abundance engineered by a previous generation has had its intended effect: a powerful society has risen unconstrained by

the limits of the land, wealthy and populous. But now nearly everything that can be used is being used; every new tap and faucet adds strain to the system; abundance has metamorphosed into scarcity. The good news for the rest of the Southwest is that it may have a little more time than California to order its affairs in preparation for climate change. It is not stretched quite as thin. At least, that's what Brad Udall thinks.

Udall directs a program at the University of Colorado called the Western Water Assessment. The National Oceanic and Atmospheric Administration funds it, and its purpose is to deliver science-based climate information to western water managers in a form and manner they can use. Udall spends most of his time on issues relating to the Colorado River. That suits him fine, for a couple of reasons. The Colorado, in the words of Mark Reisner, "is the most legislated, most debated, and most litigated river in the entire world." Nearly thirty million people in the United States and Mexico (roughly equivalent to the combined populations of Illinois, Indiana, and Ohio) depend on it for all or part of their water. If you are involved in western water and if, like Udall, you want to be where the action is, you want to work on the Colorado.

Udall also has the river in his blood. His great-great-grandfather was John D. Lee, for whom Lees Ferry is named (the apostrophe washed away long ago). Lees Ferry is the launch point for boat trips into the Grand Canyon. It is also the site of the single most important gauge along the 1,300-mile length of the river. It lies in northern Arizona a short distance downstream of what is today the Utah state line. Ostensibly, Brigham Young dispatched John D. Lee to settle at that lonely crossing in 1872 in order to build a ferry and assure transport across the river in a location vital to the growth of the Mormon colony. But Lee's assignment was more complicated than that. It was also a banishment. Brigham Young wanted to get Lee out of sight because Lee had played a large role, years earlier, in the Mountain Meadows Massacre, in which Mormon militia attacked a California-bound wagon train, killing close to 120 men, women, and children, sparing only infants. Unfortunately for Lee, even the desolation of a lonely red-rock crack in the Colorado Plateau failed to shield him from the attention of the law. Ultimately, he was brought to trial and, after lengthy legal proceedings, sentenced to death. His executioners took him to the site of the massacre, where a firing squad carried out the order of the court. A scapegoat for at least a score of guilty, John D. Lee was the only participant in the Mountain Meadows Massacre who received punishment.

Brad Udall's genealogical connection to the river doesn't end with his great-great-grandfather, nor even with his great-



Lava Falls Rapid, Grand Canyon, Arizona. The scale of the rapid is sufficient that an 18-foot raft may momentarily disappear in its whitewater. Photograph by William deBuys.

ed Arizona in Congress for thirty years and helped craft the devil's bargain that produced the \$4-billion Central Arizona Project, which brings Colorado River water across the breadth of Arizona to Phoenix and Tucson. Without the CAP, Arizona's furious Sunbelt growth would have been impossible. Brad Udall's uncle and Morris's brother, Stewart Udall, served Presidents Kennedy and Johnson as Secretary of Interior and played an even bigger role in brokering the birth of the CAP. Stewart Udall also presided over innumerable other projects touching the energy and water resources of the West, including the final construction and commissioning of Glen Canyon Dam, just upstream from Lees Ferry, which impounds Lake Powell. Both Stewart and Mo Udall embodied the values of their time when they entered public office, and they advocated for water development on a massive scale. But both also left office much changed by their responsibilities, and by the time

great-grandmother, the redoubtable Emma Lee, John D. Lee's seventeenth wife, who continued operating the ferry for several years after her husband's death. His father, Morris Udall, represent-

River in an intimate, tactile way. Udall is lean and rangy, and it is easy to imagine his long arms levering the oars of a raft. It is easy, too, to picture his considerable native energy released in the unconstrained environment of the canyon, less easy to visualize it contained behind a desk. When he talks about the river and climate change, which lie at the core of his current work, he speaks in fast long paragraphs, the words streaming almost on top of each other, so that he sometimes runs short of breath and finishes his sentences on empty lungs.

Udall has the sense that the thirty million people who depend on the Colorado River, and a lot else besides, are poised at the top of a rapid, and he has the sound of the whitewater in his ears. "What people don't get," he says, "is just how out of the ordinary these times are right now in human history." His diction is a touch unusual, a little like the old-time movie actor Jimmy Stewart. He plays with the tempo and pitch of words as though he were trying to wring something out of them that other people don't hear. "Sustainability," he intones, stretching out the syllables, "it's the IQ test for humans in the twenty-first century. And I am not certain that we're going to pass the test." Passing the test will be as hard

their public careers ended, each had compiled a legacy placing him among the leading American conservationists of the twentieth century. Nevertheless, their legacies are by no means unblemished, even in their own appraisal. Looking back, Stewart came to see his support for Glen Canyon Dam as one of his greatest mistakes.

Unlike his brother Mark and cousin Tom, both now serving in the United States Senate, Brad Udall chose a career outside of politics. He became an engineer, but not too quickly. As a young man, he indulged his affection for wild water and briefly pursued a career as a Grand Canyon river guide, learning the moods of the Colorado

in the Colorado River Basin as anyplace in the world, which is one reason the Western Water Assessment exists. The basin is rugged terrain, not just physically, but legally and politically. Most of Udall's colleagues are scientists, but most of his "customers" – the policy makers, administrators, and elected leaders whom the Western Water Assessment is purposed to inform – are not. It typically falls to Udall to fill the role of translator, and he plies his trade in both directions: the policy makers need to understand what the scientists have learned, and the scientists also need to appreciate what the policy makers need to know. Udall has won a reputation for representing each group to the other in a way that both find accurate and trustworthy. The world of the Colorado is as complex as it is big – the river's watershed sprawls over nearly a quarter-million square miles, representing one-twelfth of the continental United States. "What you see on the climate models, which makes the Colorado River Basin a little challenging to figure out, is the basin's so big north to south that parts of it sit on this dividing line where it's likely to be dry south and wet north, and yeah, you can scratch your head and go, what does this really mean?" For Udall, the likely meaning includes gradual expansion of the Hadley cell – the atmospheric circulation that accounts for a nearly worldwide band of deserts through the mid-latitudes of both the north and south hemispheres – and the risk of reduced precipitation in the areas thus affected. It means winter storm tracks moving northward, shorter winters, and generally less snow in lower elevations, "although we've got to be kind of careful here because this more powerful atmosphere can dump more snow in shorter periods of time." The clincher is that higher temperatures producing "longer summers and drier soils" will result in "5, 10, 15, 20 percent reductions in flow of the Colorado River by 2050 and potentially a lot more by 2100, depending on what goes on with humans and greenhouse gases."

Lester Snow likes to say that "All models are wrong; some are useful," and Udall agrees. He points out that science is still in the "Model T" stage of modeling, "but are we going to get a whole lot more clarity than we have now? Probably not in the next five years. But I think we've got more clarity than some people might think." Part of the problem is that people fixate on the models' lack of precision – "Is it 15 percent or 18 percent, and which one of these numbers do we plan for?" – rather than on the central message, which describes the direction and approximate magnitude of change. "It's kind of like the old famous story of the drunk looking for his keys under the light. We've gravitated to these models because they can answer these kinds of questions, but we don't step back and say, all right, how much bigger is the uncertainty than what the model has already told us?" – William deBuys

At the City's Edge: The Past and Present Lives of New York's Jamaica Bay

Window-seat passengers who look down just before landing at Kennedy Airport see a large stretch of water between the Rockaway Peninsula – the last of the barrier beaches stretching from here to Montauk Point – and the southern edge of Brooklyn and Queens. This is Jamaica Bay. Runways, sewage-treatment plants, landfills, and other elements of urban infrastructure have diminished and regularized its natural perimeter, but the patches of green in the middle are a fragmented series of small salt marshes threaded with tidal creeks. Indeed the waters and marshes of Jamaica Bay – 12,850 acres in all – collectively constitute one of the richest ecosystems along the Atlantic coast. For this reason, in 1972 it received federal protection: Congress created the Gateway National Recreation Area and made Jamaica Bay a specially designated unit within part of the country's first urban national park.

All landscapes are palimpsests of diverse intentions, reflecting the cultural values of successive eras. Jamaica Bay's is one that has been inscribed both by natural forces and human ambitions. Because it lies within the boundaries of a major metropolis, its waters, marshes, and shoreline have been contested territory, and over the years a variety of visions for their use have been put forth. Some of these have been achieved, others discarded. Among such dreams and realities are a huge industrial port, the world's first aviation field, a major international airport, a vast landfill for the city's accumulation of garbage, a recreation area with perimeter beaches, and a wildlife refuge. The Port Authority of New York & New Jersey, with its ongoing need for more runways at John F. Kennedy International Airport (JFK), and New York City's master builder Robert Moses, with his expansive recreational agenda, have been the primary agents in determining the current configuration of the bay. Its enhancement and protection as an ecosystem has fallen to such environ-

mental organizations as the New York City chapter of the Audubon Society and, most especially, to three men who made it the center of their lives and careers: Herbert Johnson, the Parks Department gardener who created the wildlife refuge in the fifties, and two of the bay's present guardians: Don Riepe, a former National Park Service employee, and Micky Cohen, a retired marine-biology teacher. Considering Jamaica Bay in the light of their stories tells us not only about the forces that continue to transform this remarkable body of water, but also how this unusual landscape has shaped their lives.

Not surprisingly, Jamaica Bay's intertidal marshes, or wetlands, were for many years considered wastelands in their natural state. To convert them to terra firma, "clean" landfill consisting of nonorganic materials such as dredged sand, excavated dirt and rocks, or building-demolition rubble were used to cover and obliterate their cord grasses, raising their surface above tide level. Alternatively, marshes accessible to dump trucks were perceived as ideal sites for disposing of the city's several thousand tons of daily garbage. These "sanitary" landfill sites too would rise above the waterline, and once decommissioned, stabilized, and capped with soil, they served as suitable land for parks and other forms of urban construction.

In 1930 Barren Island, a 387-acre marsh comprised of thirty-three small hummocks of cord grass along the southeastern shore of Brooklyn, was chosen as the site of Floyd Bennett Field, the city's first municipal airport. Pumping six million cubic yards of sand on top of the marsh amalgamated its fragments, raised the surface sixteen feet, and adhered this new-made land to the adjacent shore. For a similar purpose, in 1947, on the eastern edge of the bay, Idlewild Airport (now JFK) was built over a golf course that itself had been built over a marsh. Massive mounds also grew on top of Jamaica Bay's marshes as Department of Sanitation trucks plied the slopes like busy ants, continually expanding the girth and height of the hills with empty glass and plastic bottles; worn-out mattresses and treadless rubber tires; crushed tin cans and broken appliances; and a jumble of

discarded newspapers, magazines, old shoes, meat bones, pickle jars, and orange rinds. (Only recently has the Sanitation Department starting exporting the city's garbage by barge or rail from transport stations to landfills in other parts of the country.)

Not only Jamaica Bay's wetlands but also many others that fringed New York City's six-hundred-plus miles of coastline have been obliterated by landfill. Only with the dawning of the environmental movement in the 1970s did awareness of the consequences of the loss of this rich ecological resource come to the fore. One cannot, however, deplore the past destruction of the city's wetlands without also taking into account their urban afterlife as parks and sites for new housing. For example, the vast salt-marsh-turned-garbage-dump at Flushing Bay, memorably characterized by F. Scott Fitzgerald in *The Great Gatsby* as "the valley of ashes – a fantastic form where ashes grow like wheat into ridges and hills and grotesque gardens," was converted into a park at the time of the 1939 World's Fair. Similarly, except for a small remnant in Pelham Bay Park, a 5,000-acre salt marsh in the East Bronx was smothered by a combination of refuse and dredged material. Here, between 1968 and 1973, 320 acres became the site of Co-op City, the largest single residential development in the United States and home to 50,000 people. The same kind of landscape recycling is going on today on Staten Island where the 2,200-acre Fresh Kills Landfill is being transferred by the Department of Sanitation to the Department of Parks. The plan by the landscape architectural firm Field Operations, the winning entry in a design competition for the new park, shows some small areas of reconstructed wetland near one edge; however, the overall topography of the rest of the site – a series of mountainous ridges formed by the graded layers of several decades worth of garbage deposits – precludes further ecological regeneration along this line.

Back in the 1930s when Robert Moses, the powerful public works' czar, was the city's parks commissioner, there were garbage dumps all along the perimeter of Jamaica Bay. Once decommissioned and capped, they became in the same manner as Fresh Kills, Flushing Meadows, and the vast marshes of the East Bronx so much buildable real estate. Meanwhile, the Army Corps of Engineers was busy dredging Jamaica Bay's navigation channels and pumping sand and silt onto its marshes. Once raised above the high-tide mark, these wetlands turned into solid ground. Since Moses was determined to transform New York into a city of parks, beaches, bridges, and



roadways, he was quick to see how present and future landfill sites around Jamaica Bay could be building blocks in his master plan. First, however, he had to put a stop to the garbage dumping by wresting authority over the bay from the Sanitation Department and claiming it for the Parks Department.

During the fall of 1938 a series of articles in the *New York Times* chronicled his ongoing feud with Commissioner of Sanitation William F. Carey, whom Moses caustically characterized in the press as “a propagandist with no regard for the truth and a builder of monuments to himself.” In a well-conceived ploy to gain the upper hand, he submitted a public report to Mayor Fiorello LaGuardia in which he fulminated, “It seems incredible that after the recent experience of this administration in reclaiming Flushing Meadow, an attempt should be made by a member of it to create a worse situation in an equally important recreational center.”

The feud ended in a victory for Moses. If his dreamed-of beaches along the edges of the Jamaica Bay weren't yet feasible because of water pollution, the sites could certainly be used for other forms of recreation. Take a tour around the bay's perimeter via Google Maps: as you drag your mouse across Manhattan Beach Park, Marine Park's golf course, Canarsie Park's ball fields, Brighton Playground, Spring Creek Park, and other swaths of parkland, you will see how much he accomplished. You will also see where, in 1936, he took a former Naval Air Station and turned it into Jacob Riis Park. The new park occupied a pristine stretch of Atlantic shoreline along the Rockaway peninsula and was ornamented with a grand bathhouse that rivaled the one Moses had recently built at Jones Beach farther out on Long Island. To get to Jacob Riis Park, you will pull the mouse along Cross Bay Boulevard, constructed in 1923 to give access from Brooklyn to the little Queens community of Broad Channel, an anomalous bit of urban life on Ruler's Bar Hassock right in the middle of the bay.

Moses was no environmentalist. Nevertheless, his oversight of Jamaica Bay's 9,155 acres of water and marshland resulted in a signal victory for nature: the creation of a wildlife refuge consisting of intertidal salt marshes and an upland encircling two ponds. The history of how this came about provides a striking example of his pragmatic ingenuity, political skills, and alacrity in seizing opportunity. The story begins when the wooden trestle carrying the Long Island Railroad across the bay to the Rockaway Peninsula burned in 1950. The railroad company did not repair it but rather sold the right-of-way to the New York City Transit Authority, which decided to build a

stable embankment for a new steel trestle. It therefore needed to dredge sand from Jamaica Bay, which was now under the control of Moses's Parks Department.

Quick to broker a deal, Moses demanded that the dredging operations include embanking two areas on either side of the subway in order to create a pair of ponds that would attract ducks, geese, and other waterfowl. In addition, Moses prevailed on the Department of Sanitation to pipe sludge from a nearby sewage-treatment plant both to the site of the planned refuge and to Canarsie Pol, a sandy hummock rising in the middle of the large marsh near the Brooklyn shore. This made it possible to plant beach grass and shrubs to serve as nesting grounds for numerous shorebirds. By 1953 the outlines of the refuge were in place. Because it is so unlike the vast array of his other projects, almost all of which were intended for active recreation, probably only a few people today would identify the refuge as a Moses park. Nor do many people realize that this

Jamaica Bay Wildlife Refuge.

remarkable piece of New York City nature is every bit as

much a “reclaimed” landscape as any of the other parks Moses built on landfill around the borders of Jamaica Bay. But its creation has to be counted as one of the great successes of the master builder's long career.

The building of the Jamaica Bay Wildlife Refuge was the work of Herbert Johnson, its resident superintendent and one of the New York City Department of Parks & Recreation's unsung heroes. One of the many trained gardeners employed by the agency after they had been dismissed from several of the great estates outside the city during the Great Depression, Johnson brought considerable horticultural skills to the job. Given a house on the grounds of the refuge, he set to work planting a combination of native and non-native species. These included autumn olive (*Eleagnus umbellata*), *Rosa rugosa*, *Rosa multiflora*, bayberry (*Myrica pensylvanica*), and chokeberry (*Aronia*). Grain being another means of attracting birds, he sowed wheat, oats, and rye. He planted Japanese black pine (*Pinus thunbergiana*) seedlings, which he had propagated from pinecones gathered in Jacob Riis Park. By 1953 the outlines of



the refuge were in place, and it soon became a popular destination for bird-watchers and naturalists. To date more than 330 bird species have been sighted at the refuge, not to mention over seventy species of butterflies and many small mammals, amphibians, and reptiles. Diamondback terrapins lay their eggs in the sand. A mating ground for horseshoe crabs, it has one of the largest populations of these curious crustaceans in the northeast.

Sustaining not only the refuge but also the rest of Jamaica Bay as a viable ecosystem has proved challenging. By 1974 when Johnson retired, the empire of parks that Moses had built was in serious trouble. New York City's impending fiscal crisis spelled likely cuts in the budget of the Parks Department. Several citizens' groups including the Parks Council and the Regional Plan Association campaigned to have Jamaica Bay, the city's largest piece of parkland, become the first urban national park in the country. Advocates pointed to the changed demographics of the United States from a rural to an urban nation and the continuing population growth in metropolitan areas such as New York. A less discussed reason for the national park campaign was to relieve the city of the burden of upkeep of Jamaica Bay and Jacob Riis Park. Moreover, it would be a boon to the city were the federal government to take over Floyd Bennett Field as well, which was at that time in the process of being decommissioned as a naval air station. In 1972 the national park became a reality, and since then the Jamaica Bay Wildlife Refuge, Floyd Bennett Field, and Riis Park have been managed by the National Park Service as part of the Jamaica Bay unit of the 26,600-acre Gateway National Recreation Area, which also includes units on Staten Island and Sandy Hook, New Jersey.

I had been to the refuge before on bird-watching trips, but to see it within the context of the rest of Jamaica Bay and the environmental issues at play today, I contacted Don Riepe, a former National Park Service ranger and resource manager. He had worked at Gateway from its inception until his retirement in 2005. I gladly accepted his invitation to meet him the next day in Broad Channel.

To get there on the subway, I took the A line bound for Far Rockaway. Just before the train reached the Aqueduct Race-track stop, it emerged from underground and continued along a trestle. At the next station the riders with suitcases got off to take the shuttle to JFK. As the doors closed and the train started up again, I gazed out at the watery expanse of the bay and then at the green of the refuge's forested upland on either

[Broad Channel, Jamaica Bay.](#)



side of the tracks. I got off at the Broad Channel stop and took a look around at the community that had improbably been built on the southern end of the marsh. I later learned that the origin of this anomalous sliver of the borough of Queens dates to 1915 when the city leased the marsh island to a corporation, which in turn leased lots to private individuals who wished to build summer bungalows on the water.

Because this subway-served marine colony in the middle of Jamaica Bay did not fit Moses's grand vision for New York City's growing parks empire, he had no qualms about planning the demolition of the bungalows in 1939 during construction of the Cross Bay Parkway Bridge (now the Cross Bay Veterans Memorial Bridge) connecting Broad Channel Boulevard with the Rockaways. Indeed, the popularity of the little summer resort had waned once New Yorkers had automobile access to the Atlantic beaches at Jacob Riis Park and along the splendid boardwalk Moses built parallel to his Shore Parkway from Beach 73rd Street to Beach 108th Street.

inhabit as squatters. Only in 1982 did it finally grant them the right to do so.

Today there is scant evidence of Broad Channel's old, ramshackle character. Instead, as I walked from the subway to Cross Bay Boulevard I saw images of the Virgin Mary along with a wealth of other garden statuary inside yards enclosed

(The parkway was originally planned to extend beyond the Rockaways as a beachfront drive all the way to the Hamptons.) In 1939 the Broad Channel Corporation declared bankruptcy. The property on which the bungalows had been built thereupon reverted to the city. Moses had the bungalows condemned, and some were demolished. However, the remaining residents, many of whom had become year-round occupants, waged a protracted battle to purchase the land under their houses. For years the city denied their repeated requests to take ownership of the properties they continued to

[Jamaica Bay Wildlife Refuge.](#)



by freshly painted picket fences. There were motorboats in many driveways, and American flags in people's yards up and down the street. I passed St. Virgilius Roman Catholic Church next to which stood Christ Presbyterian Church, both built of wood, with gable roofs adorned with steeples. Because it was March, there were large shamrock posters decorating the windows and doors of several houses. Except for its unusual location, Broad Channel is by all appearances a typical New York City Scots-Irish neighborhood.

Turning south on Broad Channel Boulevard, I walked a couple of blocks to 9th Road, turned right, and went to the end where Riepe lives in a small house beside a dock jutting out into the bay. A sign outside announced that it was the headquarters of the American Littoral Society, Northeast Chapter. It is also the office of an offshoot organization, the Friends of Jamaica Bay Wildlife Refuge, as I learned when I sat down with Riepe in the half of his kitchen that is not given over to newsletters-in-the-making and all the other paraphernalia of a busy life as nature's advocate. In addition to heading these two organizations, Riepe is affiliated with several others seeking to protect the bay's water quality, fragile ecology, and periphery from infringement by continued urban development. These groups include the Audubon Society, the Metropolitan Waterfront Alliance, the Rockaway Waterfront Alliance, and the Natural Resources Defense Council. Riepe is their watchdog, since he spends approximately two days a week patrolling Jamaica Bay's marshes and shoreline in his boat, looking for such violations as illegal filling, illegal crabbing, dumping, and commercial rather than recreational fishing. He helps these groups plan conferences to develop concerted policies for dealing with environmental issues, coordinates volunteer beach cleanups, and participates in raptor-banding operations as a way of monitoring the bay's population of ospreys, hawks, eagles, and owls.

Jamaica Bay has been Don Riepe's world for almost his entire life. I asked him to recount what it was like when he was growing up in nearby Ozone Park, a working-class neighborhood next to the bay. He told me about playing in the still-untamed landscape next to Idlewild Airport (now JFK) and on the farm that stood on the land now occupied by Aqueduct Racetrack. He and his gang of friends, who called themselves the Rawhides, would steal wooden crates and other items lying around on the farm to build tree houses and go-carts, or to fashion guns with which to shoot cardboard projectiles with rubber bands.

When the boys weren't swinging from branch to branch, imitating Tarzan, they were often burrowing in the ground, building a fort by digging a trench and covering it with plywood. He described this hideout with nostalgic affection: "Inside the entrance there was an open area, where we would light candles. It was a big enough space for us to sit down." He was supposed to get home by the time the street lights were turned on, but sometimes he and his friends would stay out later, building a fire pit and roasting potatoes on a stick.

More than any of his six siblings, Riepe loved observing nature as well as playing outdoors. He told me that when he was about twelve, he became intrigued watching a killdeer performing its broken-wing act to distract his attention and force him to release the baby bird he had picked up. "I went home and looked the bird up in my little Golden Guide and identified it. After that I was hooked." In those days, it was common for teenage boys to go out with .22-caliber rifles and hunt whatever they could find. "But then one day I shot a beautiful little bird that turned out to be a downy woodpecker, and that was it," Riepe said. He decided never to shoot another bird. "But we didn't know there was such a thing as bird-watching back then," he recalled. "I just had my little Golden Guide. What really got me interested in nature was the Boy Scouts. It was a kind of paramilitary organization with drill marching and that sort of thing, but I just loved the hiking and camping, which really got me out into nature."

As a boy Riepe was always going out in the bay to fish; he and his friends would rent rowboats at Smitty's or one of the other bayside marinas. He also remembers his father piling the family in the car and driving to Beach 116th Street or Beach 110th Street in the Rockaways: "There was a bathhouse, an indoor pool with salt water, a steam bath, cold-water show-



Don Riepe.

ers, a kid's pool – everything. Then there was Playland, the Rockaway version of Coney Island. Life seemed like a big adventure. Having Jamaica Bay as my special place was an important part of all that."

After he graduated from Bishop Laughlin High School in Brooklyn, Riepe attended St. John's University in Jamaica, Queens, where he majored in English literature and took a minor in education. Between 1970 and 1974, he taught high school in Queens. Deciding that

he was not on the right career path, he went back to college to earn enough credits to apply for the master's program in Natural Resource Management and Administration at the University of New Hampshire. Before he left for graduate school in 1976, he was offered a summer job as a ranger at Gateway, where he worked for the next two summers while obtaining his degree. Luckily, at the same time that he graduated there was an opening for a field biologist position at the Jamaica Bay Refuge. "I just couldn't believe it," he said. "I had finally found my niche. I just loved it. I was even doing work on my days off, I loved it so much."

Riepe decided to bypass the climb up the government agency's career ladder in order to remain at the refuge. He told me, "I tried to manage the landscape and ponds the way Herb Johnson had done it before he retired in 1974, the year the National Park Service took over the operation of the refuge. I never knew as much about gardening as he did, but I always tried to beautify the place while making it attractive to wildlife. I also planted the landscape for guided walks so that I would have something to talk about. I put in milkweed to attract monarch butterflies, anything in the parsley family for black swallowtails, lots of Queen Anne's lace." Riepe still visits the refuge frequently when he is not out patrolling the bay. "Let's go over and take a look," he said.

Herbert Johnson's slightly dilapidated, gray-shingled house was a somewhat dispiriting place to begin our tour; the administrative personnel and rangers now work out of the new visitor center, and the house is used as a maintenance

facility. I saw several pieces of neglected-looking mechanical equipment and storage piles of gravel randomly disposed about the yard where Riepe had previously planted milkweed to attract monarch butterflies. The scenery immediately improved, however, as we began our walk along the trail that circles West Pond, looking through our binoculars at the abundance of waterfowl and shorebirds. Riepe said, “When I first started out, one of the expert birders who had been coming out a long time was my mentor. He taught me about birds and showed me how Herb had managed the ponds and stabilized the landscape. At first I planted the same plants he had planted – black pines and autumn olive, things that weren’t native but just what he could find because he had no Parks Department budget for plants. Herb even had a little nursery where he propagated whatever he could collect. In addition to building the trails, he put in two areas he called gardens – not flower gardens, but little enclosed areas where you could see a whole range of plants such as bayberry, American holly, flowering cherry, crab apple, and willow oaks, just to name a few. Herb mixed exotic and native species. Those plants are still there, but things have changed over the years. Everyone now puts an emphasis on native species so we plant more of those, although we still have lots of plants that aren’t really part of our local coastal ecology.”

I noticed several nesting boxes and a tree swallow poking its head through the entry hole in one. Riepe had installed

them when he was refuge manager. “Look,” he exclaimed, pointing out a nest of sticks on a tall, plank-topped pole. “See, there’s an osprey on the nest. You remember back in the sixties when they were practically extinct because of DDT spraying? The first osprey nest to be built in this region was on a platform that Herb Johnson erected here in the refuge. Now we have ospreys nesting on all fifteen of the platforms we have put up around the bay. We even have an osprey nesting on the hull of an abandoned boat on the other side of the bay near the airport.”

I looked up in the sky and saw a large jet taking off above the water. “That’s a Delta,” Riepe said. “After I got to know all the birds, I learned to identify airplanes. Sometimes on a slow day in the refuge or out on the bay in my boat I like to see what kinds of planes are in the air.” Speaking with regret about one extinct species, the Concorde, he said, “I know I’m an environmentalist and am supposed to have minded and that some of the people nearby complained about the noise, but those planes were really elegant. Beautiful lines. I miss them.” The airport’s plan for continued expansion into the bay remains a hot issue, particularly among naturalists and bird-watchers. Runway patrols sometimes shoot birds that come within the flight path, much to bird-lovers’ dismay.

According to Riepe, Gateway’s current National Parks Service staff at the refuge has shifted its focus from resource management to interpretation. He maintains that they do more programs in the visitor center and give less attention to nourishing and maintaining the refuge’s natural-seeming but horticulturally needy landscape. He finds this change of administrative direction discouraging: it is difficult for him to watch Herbert Johnson’s carefully created lifework being neglected – not to mention to see the erosion of his own achievements after the decades he has spent protecting and enhancing

Johnson’s legacy. He complains that some areas are mowed as lawn but none are pruned to maintain shoreline views and open habitats. His butterfly gardens are overgrown with invasive vegetation. However, he tries to compensate for this by directing landscape-care projects performed by volunteers under the aegis of the Friends of the Jamaica Bay Wildlife Refuge. Riepe is a talented photographer whose work has been featured in several nature magazines, and as we concluded our walk at the visitor center, I noticed that many of the blown-up nature photographs on exhibit had been shot by him – either in the refuge or on American Littoral Society field trips.

Since Riepe was obviously the right person with whom to tour the entire bay, I called him up again a couple of months later when the weather was warmer and his boat had been put in the water. “Come around 11:00,” he said, “that is when it will be high tide. It’s a good day to go out and see the horseshoe crabs.” When I arrived at his house, Elizabeth Manclark, his part-time assistant, helped me into a pair of waders, and the three of us climbed into Riepe’s motor launch, appropriately named “Guardian of the Bay.” Heading south through Broad Channel, we stopped a short distance away at Little Egg Marsh. Manclark assisted Riepe in anchoring the boat, and then I clambered over the edge and into the water. There in the shallows along the margin of the marsh were hundreds and hundreds of horseshoe crabs. These strange-looking arthropods are, according to the fossil record, a species that is at least 450 million years old. Normally they live on muddy bottoms and the sandy ocean floor but during the high tides of new and full moons in the breeding season they come ashore to mate.

Luckily for us, this was the breeding season, and we were in the right moon phase to observe horseshoe-crab mating in full swing. I learned that the larger ones scrabbling in the sand making little depressions were females. The males, two-thirds their size, were positioned behind them, their front claws, which look a little like miniature boxing gloves, holding on to the back of their partners’ domed shells as they were dragged along toward the high-tide line. “She’s laying her eggs,” Riepe explained, “and he is covering them with sperm as she pulls him over the nest. Look,” he continued, picking up a male and turning it over, “do you want to see something X-rated? He has two penises,” Sure enough, beneath a protective plate on the underbelly of the horseshoe crab, which Riepe held open for inspection, was a double set of tiny genitals.



An osprey returning to a nest built on an abandoned boat near JFK Airport.

The horseshoe crabs were not the only attraction. Skittering along the shoreline of the marsh was a flock of semipalmated sandpipers along with some dunlins. There were a pair of striking black-and-white oystercatchers their long red bills poking about the tidal flats, feasting like the other shorebirds on the millions of newly deposited horseshoe-crab eggs. There were numerous laughing gulls, which often breed on marsh islands such as those in Jamaica Bay. "Look over there," Riepe pointed to a large, dark wading bird with a long, down-turned bill, "there's a glossy ibis."

I felt the shore-bound horseshoe crabs brushing against my waders as I walked through the water back to the boat. Manclark pulled up the anchor while Riepe started the motor and then steered the boat through one of the little creeks that wend their way through Big Egg Marsh. We were then in Beach Channel, which runs

Horseshoe crabs mating, Little Egg Marsh, Jamaica Bay.



along the northern edge of the Rockaway Peninsula, its shoreline indented in several places with boat basins. Passing under the Cross Bay Bridge, Riepe pointed to a peregrine falcon perched high up on a ledge between two girders.

Continuing beneath the trestle carrying the subway tracks across the channel to the Rockaways, Riepe turned the boat into Vernam Basin in order to show me a recently designated city park. The spit separating Vernam from Barbadoes Basin was where, encouraged by the city's Economic Development Corporation, a developer had planned to build a truck-body customizing operation, an enterprise staunchly opposed by local citizens. Through their efforts, coordinated under the auspices of the New York City chapter of the Audubon Society's "Buffer the Bay" program, the land was instead transferred to the Parks Department. Riepe pointed out that this may be the first bit of green that migratory birds on the Atlantic Flyway see as they approach Jamaica Bay.

Returning to the main part of the channel we passed Brant Point, so named because numerous members of this geese species winter over in the bay until it is time for them to migrate to their breeding grounds on Baffin Island and in the High Arctic. Next we came to Dubos Point, a larger spit embraced by Conchs Hole Point and Motts Point. This forty-five-acre appendage of Rockaway Peninsula was a marsh before it was filled with dredge materials in 1912 to create solid land for real-estate development. Its current state as scrub forest is due to nature's reclamation of the site after development did not occur. Another "Buffer the Bay" success story, it was transferred by the Department of General Services to the Parks Department and designated a nature sanctuary in 1988. Its naming honors René Dubos (1901-1982), the microbiologist instrumental in developing modern antibiotics. Dubos was also a much-esteemed author of several books on the relationship between humankind and the environment as well as the originator of the injunction "Think Globally, Act Locally." His wife, Jean Dubos (1918-1988), was a driving force behind the creation of the sanctuary; its name commemorates them both.

We were now in Grass Hassock Channel alongside Jo Co, the largest marsh in the bay. According to Riepe, it is the best one for nesting. I could see the long necks of numerous snowy egrets sticking up above the mats of cordgrass. Here laughing gulls, oystercatchers, common terns, Foster's terns, seaside sparrows, willets, ibises, and clapper rails also make their nests. Protecting the integrity of this and the other Jamaica Bay marshes is the focus of the New York City Audubon Society's Jamaica Bay Research and Management Information Network, which over the past twenty years has sponsored the Harbor Herons Nesting Survey, an annual data-collection project. A companion Audubon effort, the Harbor Herons Shore Monitoring Program, is a citizen-science initiative funded by the New York City Environmental Fund. Its mission is to observe the colony of herons, egrets, and ibis on Canarsie Pol and the marshes surrounding it in order to determine their flight lines and foraging patterns. Riepe participates in both these projects, making day-to-day observations as he patrols the bay in his boat. At the same time he is able to check on the ospreys nesting atop the fifteen platforms scattered across the bay.

Now JFK airport was directly ahead of us. Its longest runway already penetrates the eastern edge of Jo Co marsh. Riepe and other Buffer the Bay advocates are engaged in an ongoing dialogue with airport officials over proposals to build more

View of JFK Airport from
Jamaica Bay.

runways out into the bay. As a member of the Bird Hazard Task Force, he tries to logically counter their fears that gulls, geese, and ducks in flight pose a serious danger to low-flying planes. As he brought the boat as close to one of the runways as possible, through my binoculars I happened to simultaneously spot a Delta airplane and a great blue heron soaring over Jo Co Marsh. This juxtaposition made me understand why Riepe likes to watch both the birds gliding in easy arcs over the marshes and the jumbo jets rising into the sky in a straight line and landing with such precise purposefulness.

Having reached the airport's no-trespassing zone at the eastern edge of the bay, we turned around and headed back along Grass Haddock Channel beside Jo Co Marsh. Across the water at Elder's Point Marsh we spotted a rookery in a big tree where cormorants occupied at least two dozen large stick nests in its branches. Riepe next steered the boat into Mucke Creek, which separates Jo Co marsh from Silver Hole Marsh. Because of the rising tide, we were able to thread a passage through the dense mass of marsh grasses. On either side of the boat we saw a large number of nesting egrets and other shorebirds. Passing out into Broad Channel, Riepe went north toward the open water of Grassy Bay. The edge along the airport side has been extended with dredge spoil in a perfectly straight line, a project carried out by the Army Corps of Engineers.

The Corps' relationship to the bay is a particularly interesting one; it is charged with constructing and managing the nation's military and civil infrastructure, but its purview includes water resources as well. It is therefore the governmental agency responsible for working with the Environ-



mental Protection Agency, which has as its stated goal "the protection and maintenance of the chemical, physical and biological integrity of the nation's waters." Although these words do not include the phrase "restoration of marine ecologies," the Corps is involved in projects directed toward environmental regeneration, which in the case of Jamaica Bay means using its dredging equipment to rebuild marshland. It is a Sisyphean task, for according to the New York State Department of Conservation, the rate of loss of intertidal marsh islands is accelerating. Between 1974 and 1994, 526 acres of marsh islands were lost – an average rate of 26 acres per year. Between 1994 and 1999, 220 acres were lost – an average rate of 44 acres per year.

Riepe blames the accelerating marsh erosion less on climate change than on the city's combined storm-water and sewage system: when it rains heavily, untreated water from the four large sewage-treatment plants on the perimeter gets discharged into the bay. Even without such events, though, the treated wastewater does not meet clean-water standards, a matter that was cause for a recent lawsuit by a consortium of environmental agencies including the American Littoral Society. Although it is detoxified and the sludge separated out, Riepe feels that the effluent still has too much nitrogen content. "The bay gets overnutrified, and this causes the bloom of

algae," he explained. "Then you get bacteria and nematodes working together, and this starts to eat away the root systems of the spartina and other vegetation that holds each of the marsh islands intact. As this process destroys them from the inside as well as the outside, they start to fragment, and that increases the amount of edge that can erode."

It is thus obvious that if the bay is to retain its character as a fecund wetland where birds breed, fish spawn, and horseshoe crabs mate, the Army Corps' marsh-rebuilding efforts with federal environmental mitigation funds provided through the Clean Water Act need to be accelerated. The work is necessarily incremental, expensive, and slow, so the question is raised whether reclamation can keep up with reduction. In the race between gain and loss, it would appear at this point unwise to bet on the remaining Jamaica Bay wetlands staying intact, much less accreting.

Nevertheless, Riepe is hopeful. As we turned west into North Channel, he pointed to a marsh with an orange fence surrounding it. This was Elder's Point West, the Army Corps of Engineers' first major marsh reclamation project to be completed after Elder's Point East. Since the agency works with the Port Authority on keeping shipping channels deep enough for large, ocean-going vessels, it is sometimes a case of one hand helping the other. Pointing ahead, Riepe remarked, "Here the Corps brought the sand dredged out of the shipping channel at the Rockaway Inlet near the mouth of Jamaica Bay into this area and stored it. Then they pumped it onto this piece of marsh, increasing six acres to thirty. After that they planted spartina grass on top. It took two years to get the whole thing up and going, but I think they did a very good job." The cost of this project was \$15 million.

Riepe turned the boat around and started back south through Pumpkin Patch Channel alongside of Black Bank Marsh and Yellow Bar Marsh, the combined site of the Army Corps' next marsh-reclamation project. "This is going to cost many millions," he said. "The City will put up \$15 million over the next few years and will get a two-to-one match from the Corps, which hopefully means there will be \$45 million available to complete this phase."

We had made a reasonably complete circuit of the bay, and it was time to head back to Broad Channel. As Riepe pulled the boat up next to the dock and Manclark helped me get out, we were greeted by the sight of a perfectly tame great egret that appeared to be knocking at Riepe's door. "That's Egor the Egret," she said, as I looked closely at its black stalk-like legs and drooping fringe of white tail feathers. Its long yellow bill

was open as if in expectation of a snack. Riepe went inside and came back with a handful of minnows from the refrigerator, offering them one by one to Egor, who avariciously plucked them from his fingers. His other dock resident, Louise (a Peking duck who was named Louie until she laid an egg), waddled over for her share.

On the way back to Manhattan on the A train, I thought about the importance of place in all our lives. I realized that Riepe's stewardship of Jamaica Bay was an expression of personal identity. I realized too that his work to preserve its ecological richness was but the latest mark on the palimpsest of inscriptions that had altered and reshaped this extraordinary landscape over the years. When I got home, I called him to thank him for the boat tour. "Tell me," I queried, "what exactly is it that attaches you so strongly to Jamaica Bay?" He replied, "I guess I have the nature gene. Nature has been a great healer whenever I have felt discouraged or depressed. I like to lead American Littoral Society birding tours to such places as Nicaragua and Iceland, but I really don't need to go far away to experience such an abundance of natural phenomena as you find here. Jamaica Bay is my home. I can't see living anywhere else."

Mickey Cohen shares with Riepe a lifelong attachment to Jamaica Bay and an ongoing commitment to protecting its natural resources; his happiest boyhood memories are also of this place. In his case, however, they are not of the still-wild reaches of the bay's eastern side but of a man-made part of the landscape: Floyd Bennett Field's concrete runways on the bay's western edge.

Since the inception of Gateway, when the National Park Service acquired the old airfield, there have been several master plans put forth that have called for tearing up the old runways and building new recreational facilities on the site, but they have never been carried out. Even now, after a \$2.4 million federal appropriation has been secured for that purpose, citizens who have participated in the advocacy and planning efforts over the years are not holding their breath. Indeed, the director of the National Park Service's recent statement that six hundred campsites will be planned for the area over the next several years is being met with skepticism. According to Cohen, "In light of the safety hazards – broken fire hydrants, deteriorating buildings, cracked pavement, closed off roads and the like – before anything could happen, there would have



to be a huge investment in infrastructure. Even then, the Park Service would have to find a concessionaire to manage it because operating a facility of that size would be way beyond the capacity of ordinary park rangers."

For Cohen, however, Floyd Bennett's limbo status is not a source of regret, as it is for so many others. Although he is a former high-school marine-biology teacher and as much of a naturalist as Riepe, with whom he works closely on various projects to protect the bay, Cohen has a sentimental attachment to the old airfield that reaches back to his childhood. Moreover, he views the story of Floyd Bennett Field as a fascinating synthesis of nature and technology. At our first meeting there, he took me to a picnic table at the edge of the most northern runway, where he narrated the airfield's history. Named for the aviator who piloted Admiral Byrd across the North Pole in 1926, Floyd Bennett began operation in 1931. Barren Island, part of the original marsh before the superimposition of the airfield, still had a huddle of ramshackle dwellings, a remnant of its settlement in the mid-nineteenth century when impoverished laborers – Irish, African American, Italian, and Polish immigrants, for the most part – occupied this isolated piece of land on the city's all-but-forgotten fringe.

"The economy of Barren Island provides an early instance of urban recycling," Cohen explained. "This godforsaken part of the city was where they manufactured fertilizers and other products from dead animals whose bones were boiled until they rendered a thick, soupy resin. They also processed fish oil from menhaden caught in the bay. The oil was used for tanning leather, mixing paint, and making ropes for ships. After bay pollution destroyed most of the menhaden, Barren Island became a dump where New York City residents' garbage got all mixed in with sawed-up pieces of animal bone."

At the time Floyd Bennett was built, the authors of the *WPA Guide to New York City* could boast of its Art Deco administration building flanked by eight 120- by 140-foot hangars; four concrete runways measuring from 3,200 to 4,200 feet long; two landing towers equipped with 5 million-candlepower floodlights; a directional radio beam; and a special runway bordered by contact lights. The preponderance of planes at the airfield belonged to flying clubs, flying schools with courses in aviation available to civilians, and private entrepreneurs specializing in sightseeing trips. Sharing the runways with these were the aircraft of the U.S. Marine Aviation Base, the Coast Guard, the New York City Police Department, and a small number of commercial planes flying between Boston and New York. It was a time of breathtaking, record-breaking aviation feats, the most famous of which occurred in 1938 when Howard Hughes circled the globe in three days, nineteen hours, and eight minutes.

Because of its location at such a distance from the center of the city, however, Floyd Bennett was unprofitable in terms of revenue. When La Guardia Airport – then called Municipal Airport #2 – opened in 1939, the city decided to sell Floyd Bennett. The U.S. Navy was the logical purchaser, and the subsequent expansion of Floyd Bennett's existing naval and Coast Guard facilities put the airfield in the forefront of America's preparedness for World War II. Escort air patrols were deployed to protect merchant convoys carrying shipments of armaments to overseas allies from German U-boat attack. These patrols were greatly expanded as the war got underway, making Floyd Bennett Field the busiest naval station in the United States. New York City was at that time the largest manufacturing center of naval aircraft in the nation, and every type of plane was tested and fitted out at Floyd Bennett before being commissioned into the Navy. Most of the forty thousand aircraft that were vetted there went to the Pacific theater where the war against the Japanese was being waged in large measure by naval aviators. "It was a very exciting era in our nation's history," Cohen concluded.

As a child growing up in the Borough Park neighborhood of Brooklyn in the 1930s, Cohen was taken by his father to see the planes when Floyd Bennett Field was still a municipal airport. "In those days," he told me, "there was a man who sold rides in a biplane. I was too young to go up, and I was so jealous when my eleven-years-old-brother, Mervin, and a friend were given a ride in a plane. They loved it so much that shortly afterward when Pearl Harbor took place, both my brother and

his friend enlisted.” Mervin, whom he idolized, became a famous pilot, and the younger boy was eager to follow in his brother’s footsteps, but when he tried to enlist the recruitment officer told him to finish high school first. By the time he was inducted and ready to become a pilot in 1945, the war was over. Ruefully, he said, “I was retested for a ground job, and I became an aircraft welder. That was my occupational specialty, and I was good at it. But it was a big disappointment to me that I never got to fly.”

When Cohen returned to civilian life in 1946, he didn’t see the point in going to college when he could make good money as a welder. A family friend thought otherwise and went so far as to enroll him in Long Island University (LIU) in Brooklyn. At first he resisted, but when he realized that he could still go up on the days he didn’t have classes with the pilots who made practice flights, higher education won out. He received an honors degree in biology at LIU. His life’s course thus redirected, he worked as an environmental science teacher in the New York City public-school system for the next thirty-one years. In that role, he helped launch several nature-study programs for the New York City Board of Education.

As we drove in Cohen’s car toward the southern end of Barren Island, he pointed out the house foundations and faded street signs of what was once a village for naval officers. One short row of houses has been left standing and is used

today as living quarters for the National Park Service rangers assigned to Gateway. “There was always some kind of community here going back to the early 1800s,” he remarked. “You had escaped slaves and blacks who made their way up here after the Civil War.” Pointing to a tangle of brambles, he said, “There was a school here during World War II and an even earlier one-room schoolhouse – P.S. 120 – on this site.” He told me how Jane Shaw, the teacher and principal of the school, taught the children of the remaining families of bone boilers and garbage scavengers. From 1917 until 1936, she commuted from Brooklyn each Sunday and returned home on Friday, meanwhile living in the little, malodorous community where she was considered something of a mother figure to the children of the poor laborers. According to Cohen, she bought a piano with her own money and taught them music and dance. When Robert Moses evicted the remnant hardscrabble colony on Barren Island in 1936 at the time of the construction of the Marine Park Bridge – like Broad Channel Bridge, it was built as a means of connecting Brooklyn to newly created Jacob Riis Park and the other Rockaway beaches – Shaw got him to accede to letting the children finish their school year.

The next stretch of the Barren Island landscape Cohen took me to see was Dead Horse Bay. Like Herb Johnson and Don Riepe at the Jamaica Bay Refuge, Cohen was able to act on his own authority in terms of improving the site for aesthetic and educational purposes.

In the early days of Gateway he cut a series of three trails through the vegetative overgrowth in the area beside Dead Horse Bay. Working with the Board of Education’s Division of Curriculum Instruction and the Gateway Environmental Study Center, he authored a teaching guide in which the trails functioned as nature discovery walks.

Running south toward the mouth of the Rockaway Inlet is the Millstone Trail, so named because of the mill-

stone uncovered in the early days of Gateway by park rangers while making a firebreak. Cohen explained that early settlers of marshy areas with tidal streams like this one used water to power their mills for grinding corn and grain. The Salt Marsh Trail angles off in the opposite direction, and a third trail, which Cohen calls the Express Trail, provides the most direct route to the water’s edge. Unfortunately, the original station markers planted by Cohen at spots where his teachers’ handbook described the biota (coastal scrub vegetation such as bayberry, little bluestem grass, and American beach grass, or mollusks and crustaceans such as periwinkles, mud snails, surf clams, mussels, and barnacles) have disappeared. I didn’t need to worry, though; Cohen was my living handbook.

When we reached the water’s edge after walking through a small maritime forest, we stood at what would be Station 11 of the Millstone Trail. We had arrived at Dead Horse Bay. Strolling along the narrow beach I could see the Verrazano-Narrows Bridge and the hills of Staten Island in the distance. Here, where the Rockaway Inlet surges into Jamaica Bay, the shoreline is subject to heavy erosion, and city engineers have erected a barrier composed of the debris from building excavations and surplus quarried stone. Station 11 is thus an excellent spot for Cohen’s geology lesson on mica schist, pegmatite, red sandstone, and limestone. He also showed me the strips of colored sand along the beach that mark the congregations of minerals of different densities at various water elevations: “Higher up you get magnetite, which is reddish because of the garnets in it; then there is the yellowish sand, which is heavy in feldspar; and further down you find the heavier quartz that the tide doesn’t carry up as far.”

But the most exciting geology lesson the place had to offer was one about what happens when storm waves tear into the site of an old bone-boiling works cum city dump. I was amazed at the weird beauty of the things I saw in the sand: glass bottles of all kinds, Art Deco ashtrays, tangled skeins of what were once nylon stockings with seams up the back, old roller skates, broken lamp bases, random bits of animal bone. Cohen explained the history of the area: “In the early twentieth century when wetlands were considered nothing more than malarial danger zones, this place was used as a dump. Then it was closed for a time but was activated again in the 1950s. In 1958 it was capped and sealed off, and the garbage stayed pretty much in place until one of the big storms in the 1980s tore into the bluff over here and the landfill started just pouring its contents out on the beach. And with every storm it just keeps pouring.”



Shoreline, Dead Horse Bay.

Dead Horse Bay is a fascinating place for an amateur archaeologist to poke around. For instance, Cohen knows that 1958 marks the date of the landfill's closure not from historical research but because buried newsprint does not oxidize and none of the multitude of newspaper fragments he has found have dates later than 1958. "Oh, how they loved their Brooklyn Dodgers!" he exclaimed. "You can still read those old sports pages. And think of what they ate for breakfast; I can't tell you how many old waffle irons and maple-syrup bottles I've found." Bending down to pick up a piece of bone that looked as if it could have been the remains of a meal of osso buco, he was carried further back in time. "See, they cut up the bones just like butchers with their slicing machines. Then they boiled them until they got a nice nutritious soup of minerals and chemicals at the bottom. That is what they turned into things like fertilizer, glue, and pharmaceuticals." Cohen pointed at the sandy bluff that was being torn away by the currents of each high tide: "1958 is thrusting itself out of this wall." Brown Clorox bottles constituted the most abundant type of beach detritus littering the shore because, he reminded me, "Back in the 50s, they lived in a world of white." This prompted us to sing a chorus of the old radio jingle "Rinso white, Rinso bright, Happy little washday song!" before, laughing, we walked back to the Gateway ranger center where Cohen's car was parked.

Because of the many delays in obtaining federal funds for the conversion of Floyd Bennett into the active recreational component of the Jamaica Bay Unit of Gateway, as envisioned by several planning efforts put forth in the past, the National Park Service granted a 20-year license to Aviator Corporation to operate a sports complex on the site. We drove by the two former hangars with Art Deco-style insignia on their façades that this private enterprise restored and con-

Bayswater Point State Park with Edgemere landfill site in the background.



verted into hockey rinks. These buildings are surrounded by more than twenty acres of paved concrete, and here we saw men setting up one of those temporary amusement parks that itinerant carnival operators erect in vacant lots or open fields – a mini-Coney Island in the middle of a national park.

As we drove down one of the old runways, Cohen pointed to a huge metal building known as Hangar B. Although in visible disrepair, since 1995 it has housed the Historic Aircraft Restoration Project (H.A.R.P.). He remembers when the hangar was used for the amphibious planes that used to fly into Floyd Bennett Field and later when it was used by the Department of Sanitation as a training center for its truck drivers. Now it serves volunteers, mostly Air Force veterans, whom the National Park Service permits to restore vintage planes. Weekend open houses allow visitors to see several of these that are in the process of being brought back to mint condition. Cohen reeled off the names of the kinds of planes you might find in this de facto military air museum: a Beechcraft JRB "Expeditor" military transport; a Consolidated PBY-5 "Catalina" patrol bomber; a Douglas C-47 "Skytrain" transport; a Fairchild PT-26 "Cornell" military trainer; a Grumman HU-16 "Albatross" military patrol; a Lockheed P2V "Neptune" anti-submarine patrol; a Douglas A-4 "Skyhawk" carrier-borne attack plane; a Sikorsky HH-3 "Pelican" air-sea rescue helicopter; and a Stearman N2S-2 "Keydet" military trainer. As we retraced our way slowly down the runway, he confided with

boyish enthusiasm, "When the National Park Service turned Floyd Bennett Field into Gateway, I realized that there were no longer military police around and that I could just come in and wander around, which I have been doing ever since. You can go into these overgrown bunkers where they stored ammunition and find hundreds and hundreds of strange vials as well as miles and miles of communication wires. I keep on making new discoveries all the time."

Cohen and his wife, Barbara, live in Far Rockaway, the town at the easternmost end of the Rockaway Peninsula next to the Nassau County line. Although it is not as grand as it once was, it's still the most upscale community in the Rockaways. Their neighborhood, Bayswater, was so named because it faces Jamaica Bay. The Cohen's house is on Point Breeze Place, a beautiful tree-shaded street. Architecturally distinguished, this 1890s structure was probably built for the owner of one of the big hotels that overlooked the beach when Far Rockaway was still a fashionable summer retreat for New Yorkers. It has a Dutch gabled roof, a handsome portico supported by white columns, and an upstairs as well as a downstairs porch. Large windows on the front of the house let in plenty of light, and a beautiful staircase at one end of the living room sweeps upward in a graceful curve. The Cohens have lived here since 1961.

On a warm Sunday in June, they invited me for lunch. "When we moved here," Barbara told me, "we knew nothing about the Rockaways. We just fell in love with the house." Mickey, who taught science and biology in Bayridge High School in Brooklyn was soon assigned by the Board of Education to Far Rockaway High School, and they settled in for good. In 1973, the Board asked him to plan a curriculum for a new high school that was to be built at the western end of the Rockaway Peninsula on the site of Playland, the defunct amusement park. What would today be called a magnet school, Beach Channel High School focused on a particular subject area – in this case marine biology and oceanography.

Influential in the design of the \$65-million-dollar building – the most costly New York City public school built up to that time – Cohen was able to get salt water as well as fresh water piped to the lab tables. Every student was furnished with a fish tank. "I would send the kids out early in the morning before school started to collect all kinds of things from the bay – sea anemones, sea stars, crabs, hydroids," he said. "The marine theme was not confined to the science classroom but was carried across the entire curriculum. In home economics the students learned about how to prepare seafood; in English class they read books like *Moby Dick* as well as sea



Home of Barbara and Mickey Cohen, Bayswater, Far Rockaway.

When it was put up for sale in 1986, the New York City Chapter of the Audubon Society took a leadership role in advocating its preservation as a key parcel in its seven-hundred-acre “Buffer the Bay” program. The Trust for Public Land thereupon stepped in and purchased the property for \$1.5 million. However, before New York State would agree to repurchase it in 1988 with funds from the 1972 Environmental Quality Bond Act, it was necessary to hammer out a management strategy since the state was reluctant to oversee such a far-flung piece of land. To clinch the deal, the local Audubon Society agreed to take on this responsibility, and Bayswater Point State Park was officially dedicated in 1991. It was not hard for Audubon to find the right management team. Mickey and Barbara, who had been part of the process from advocacy to acquisition, lived – literally – a stone’s throw away. “Come,” said Mickey, handing me some insect repellent, “I’ll take you around the corner to see the park.”

Near the entry he showed me two large trees: a tall cottonwood poplar that he had planted twenty years ago and a catalpa that appeared to have been growing there many years before that. They were surrounded by maples, oaks, and black locust trees, native species that grew alongside the invasive phragmites reeds that were marching up from the shore to the edge of the lawn. Cohen explained that the Audubon Society’s eagerness to save this particular parcel was due not only to its position as the anchor parcel in a forty-five-acre stretch of unspoiled Jamaica Bay shoreline but also because the mature trees on the site attract land birds, providing a greater variety of species for birdwatchers to observe.

“Here are the foundations of the old house,” he said as we walked to a rise in the lawn that sweeps down to the water’s edge. “Unfortunately, no use for the old mansion could be found and it was too expensive to maintain, so it had to be demolished. Barbara and I were really sorry to see it come down.” After pacing out the building’s dimensions – it was 175 feet long – we strolled down to the water’s edge where a family was having a picnic. Planes were taking off across the bay every few minutes, and opposite the airport I could see the ridge of the former Edgemere landfill, which has been capped and covered with grass seed.

Diseases in 1925; after that the Maimonides Institute ran it as a home for retarded children.

After I had said goodbye to Barbara and Mickey, I went over to the ocean side of Far Rockaway and walked along the boardwalk that Robert Moses had built. I thought about the many lives of Jamaica Bay and of the successive urban-planning visions imposed upon it, each one expressive of the values and perceived needs of the time: a convenient location for dumpsites; flat, unobstructed terrain for runways and ball fields; an improbable but fecund refuge for wildlife. The resulting scenery could only be appreciated in terms of all the people whose decisions have shaped it. Indeed, the hand of man was evident everywhere you turned. And yet, so was the hand of nature.

I remembered something Don Riepe had said to me. “It’s tough being an environmentalist in a world where there is one disaster after another. We

Former Heinsheimer Mansion, Bayswater, Far Rockaway.



are living in such dire conditions, and if we can’t handle population growth, the result is going to be chaos and revolution. But here at Jamaica Bay we have an example of nature healing itself where it’s been given a chance. Look at it this way: despite over a hundred years of degradation, the Jamaica Bay ecosystem serves as a natural oasis surrounded by a sea of eight million people. An amazing diversity of species still survives in its waters, marshes, and uplands. It is imperative that we preserve and protect the bay and remaining natural areas within the city as the future of our species may well be dependent on it.” – Elizabeth Barlow Rogers

poems; in shop, instead of just learning automotive skills they learned how to repair boats. It was a great thing, since some of the boys then got summer jobs working in marinas around the bay.”

During the 1970s it was becoming obvious that the New York City public-school system, once the cynosure of the nation, was beginning its years of decline. Cohen felt that he was at the apex of his profession and that it would be better to end his career as a public schoolteacher than to try to cope with the mounting frustrations he saw ahead. (Today Bay Channel High School is one of the lowest-performing schools in the New York City public-school system.) But retirement was hardly a word in either of the Cohens’ vocabulary. Mickey got a job at the New School for Social Research, where he taught natural history for the next seventeen years in the continuing-education program. Barbara, who had also been a schoolteacher, became the coordinator for American Littoral Society’s Beach Cleanup program for New York State. Before stepping down in 2010, she worked closely with Don Riepe each year to organize 10,000 volunteers to pick up and document the debris discovered around Jamaica Bay and three hundred other sites on the rest of the state’s four hundred miles of beaches.

Perhaps the most satisfying environmental project for the Cohens was the one they worked on together: the conservation of a fourteen-acre estate overlooking Jamaica Bay’s Mott Basin. Originally the site of the huge 1907 Tudor-style Heinsheimer Mansion, it became the property of the Hospital for Joint

Poetry

Why the Lake

*Because so much water
gathered at such a height
that its majesty called,
just as the lake called to draw blue
out of the day's sky
and later the night's black.
Of course the sky drew
the lake out of itself,
at first invisibly
but then colorfully
so the sky could paint itself
white in places,
make mountains of grays,
and when too heavy to hold,
the sky let the lake go,
bit by wet bit in an unexpected
sparkling of droplets.
To be in that space
between the lake and the sky
was to be inside chanting,
desire made so celestial,
it stops.*



Once the Ocean Takes You

*The ocean grants you absolution or it floods you
With sin. Either way it cleanses itself, water
Rushing toward bigger water.
Fish water, whale water, water of barnacles, starfish,
And salt, water gleaming through ages
Of starlight, moonlight, sunlight,
and hiding most of itself in the dark.
Once the ocean takes you, it's over. You can gaze
All you want into the distance, but nothing else consoles,
just the huge restlessness of water in which you see
all your past, all your time to come, all the questions
about what makes love like sand, its infinity of drifts
and shapes, close up its cosmos of debris and sparkle,
nothing but the blue horizon in its umpteenth blues,
all calling you to where you belong,
at the ocean's edge, feeling at peace,
understanding nothing.*

– Barbara Ras

Place Maker

Michael Van Valkenburgh and Brooklyn Bridge Park

Landscape architect Michael Van Valkenburgh is given to pithy and memorable statements; intended perhaps as generalizations, they always relate to a specific point. This one, for example: “However you imagine a landscape, in reality, it is always better; I am shocked to see how plants grow.” Never was this truer for him, one imagines, than when observing the luxuriant pastoral landscape of Brooklyn Bridge Park – designed by his firm, Michael Van Valkenburgh Associates – in its second summer. As with other great parks created on land where nothing existed before (here there were only docks and dilapidated warehouses), one stands in wonderment gauging the formation and growth of this totally created topography and ecology – a lush green island of nine and a half acres surrounded by a dramatic urban scene.

As one thinks back to André Le Nôtre’s Versailles or Frederick Law Olmsted’s Central Park, these historic landscapes were also visions laid out on flat ground, only later defined by evolving landscapes of trees and plants that grew to full maturity in a future beyond that of their creators. But whereas Versailles had a palace in the countryside as its backdrop and Central Park a surround of upscale avenues in development, Brooklyn Bridge Park had to contend with the Brooklyn-Queens Expressway. This noisy double-decker highway, cantilevered high above from an adjacent rocky cliff, is part of a road system visited upon New York in the fifties by urban planner Robert Moses that distanced the city from its waterfront. It is a pleasant irony, therefore, that the effects of this highway have been considerably mitigated in the park by rolling green earth forms precisely calculated at thirty feet high to buffer the sound of its traffic.

Brooklyn Bridge Park, on the eastern bank of the East River, appears then like a segment of hills, dales, and rural meadows inserted into the most urban of landscapes, and people are flocking to its grassy slopes and tree-lined pathways to enjoy the river and its breezes as the tides flow in and out along newly created, rocky shores. At every turn, water is integrated into the experience of the park; the visitor weaves around wetlands, salt marshes, and tidal pools.

While the term “postindustrial” has become a catchword for characterizing landscapes developed on terrain damaged by previous commercial uses, Brooklyn Bridge Park is

Lake Titicaca, Peru.



Michael Van Valkenburgh and his grandson Jack, December 2010.

industrial beauty of the Brooklyn and Manhattan suspension bridges that, arcing against the sky, have inspired artists as much as any natural landscapes. And across the river, Manhattan's irregular wall of skyscrapers – that robust symbol of the city's wealth – dissolves at night into a myriad of glittering lights.

Michael Van Valkenburgh says that he only got to know the Frederick Law Olmsted of Central Park when he moved to New York from Cambridge, Massachusetts, at age fifty. In creating the land flow and upland meadows for the first segment of Brooklyn Bridge Park on Pier 1, he drew on a different pastoral tradition: the rural lanes of his youth on a dairy farm in the Catskills. In keeping with two of his principles, "Make what you like by starting with things you know" and "Surround yourself with early images," he designed spines of curving pathways shaded by what he calls "hedgerows" of densely planted trees and shrubs. The fence containing them, low wooden posts of black locust separated by wires under tension, is reminiscent of cattle fences his father built on the farm.

Planted last year, the hedgerows are now burgeoning with shore rose, oakleaf hydrangea, buttercup winter hazel, 'Hummingbird' summersweet, cherry laurel, and multi-stemmed trees (three for one, as Van Valkenburgh explains), honey locust, sweetbay magnolia, 'Columbia' London plane trees, small-leaved linden, and Kentucky coffee trees; their pattern of enclosure conveys a sense of back-roads intimacy in the landscape that contrasts sharply with the majestic urban views beyond. On one side of the main pathway, multistemmed plane trees are planted without an under-

a special case. Its eighty-five-acre site, with six piers for development on a waterfront stretch of 1.3 miles, was formerly a port for cargo ships and attendant warehouses. Although the port died a natural death when more profitable, heavy-duty container shipping took over on the New Jersey waterfront, its former setting is still enhanced and literally uplifted by the soaring

story of shrubs, and at regular intervals there are breaks in the fencing that define entrances to central sloping lawns. This configuration, with visibility through a veil of trees, is an intentional salute to urbanist William H. Whyte, who called for transparency between sections of public landscape. In general, plants selected for the park are either native or those that colonize other abandoned docks. In time, opportunistic trees like sumac will be weeded out as the canopy of mature trees grows to full height in a process called plant succession. In any event, this is a new ecological setting whose future will be determined by the interaction of the plants themselves and the birds and insects they attract.

For Van Valkenburgh, walks and stairs are the engines of design – or what he calls "the choreography of space." Seen from the Brooklyn Heights Promenade above, the park's main circuit of pathways forms a lopsided figure eight, with twists and turns like a dancer's spin across a stage that increase the visitor's choices in traveling through the park. Smooth paths of pale grey stones embedded in concrete give way to steps as the land inclines toward the river, leading to a grandstand of massive granite blocks salvaged for the park from recent work around the Roosevelt Island Bridge. The seating resembles bleachers, and the arena is the city itself. Stepping down, there is the promenade at the

water's edge – the most delectable treat of all and the thread that pulls the whole plan together.

Terraces on the east side cascade through wetland gardens and along a swale that collects storm water run-off from the hillsides and parking areas before it flows into the river. The water is then stored in underground tanks and recycled for irrigation purposes. In brief, Brooklyn Bridge Park, contoured with earthworks to create hilly meadows and engineered with waterlogged gardens that appear utterly natural, succeeds triumphantly as landscape architecture.

Water leads to waterside, where shallow granite blocks embrace a salt marsh of smooth cordgrass bordered by a field of granite boulders, salvaged from demolition around the Willis Avenue Bridge. A long ramp of interlocking pavers slants down to the water's edge as a boat-launching amenity for canoeists and kayakers – kayaking being the sport of choice at the city's new waterfront parks. To walk down to the river here and listen to the water lapping against the rocks returns the city-dweller to the refreshment of the sea. Out in the water, scattered rows of wooden piles of various heights evoke memories of abandoned piers and old ferry landings.

After dark, downlights attached to the top of forty-five-foot-tall masts of telephone poles cast an even, moonlight glow over the whole park that can be dimmed as the hours wear on toward morning. These fixtures make it possible for late dog walkers, say, to see from afar in a way not permitted by intermittent, pedestrian-scaled light poles; Van Valkenburgh believes that their scale is in keeping with the great heights of the bridges above.

Even the long, slatted park benches of recycled wood have a distinctive unifying character. When the original cold-storage building on the pier was dismantled, its boards of



Aerial view of Brooklyn Bridge Park. Photograph by Alex Maclean.

longleaf yellow pine were salvaged; and after removing nails and other metal, the lumber was remilled and stock-piled for use in benches, picnic tables, decking, and cladding for small park structures.

And this is only the beginning, as there are five more piers being resurrected. For the land behind the greenway cum bike path that links the piers, developers will be selected to build condominiums and a hotel to generate income that will support the park's maintenance. Adventurous and challenging playgrounds – one devoted to water play, another to swings – are already in place for children of all ages. For the remaining piers, in addition to recreational and sports facilities, there will be a marsh garden and lawns for cultural and civic events; a marina will provide rental slips for boats. And under the Brooklyn Bridge itself, in a transparent acrylic pavilion designed by Jean Nouvel, a 1922 carousel from Youngstown, Ohio, will be a glittering jewel on the water. Called Jane's Carousel, its horses have been restored by Jane Walentas.

One naturally thinks of parks as refuges or retreats, places away from the noise and activity of urban life, where paths lead to secluded and peaceful landscapes. As I walked in Brooklyn Bridge Park for the first time in the summer of 2010 with Michael Van Valkenburgh, I realized that this park is an exception because ultimately it is as much about what is outside its confines as what is inside. It is primarily a tilted perch looking out on the dramatic environment surrounding it: the city, the bridges, and the luminous sheet of a river alive with the endlessly fascinating maritime traffic that plows its flowing waters. Every inch and slant of the park's terrain has been designed with these views in mind, and while Michael Van Valkenburgh claims that he wants himself and his fellow designers to be absent in this seemingly natural landscape, given the unique qualities of their creation, I say not a chance.

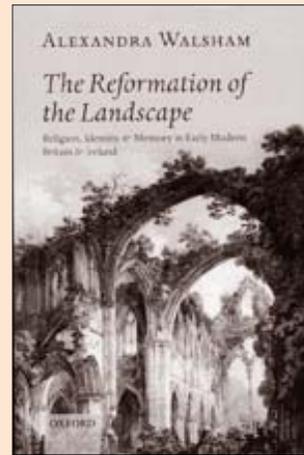
After that first walk with him, I returned to the park the next night in time to watch the movie *Rear Window* along with thousands of picnickers on the sloping lawns; the screen was raised at the edge of the river walk. I grabbed an ice cream for dinner and camped out on a stone step under a rugosa rosebush. Pure pleasure that suspense film, but nothing on a warm summer night could compare to the drama all around it: the glamorous panorama of city lights across the river, the flickering stream of car lights crossing the bridges, and the lone torch of the Statue of Liberty in the harbor. – Paula Deitz

Books

The Reformation of the Landscape: Religion, Identity, and Memory in Early Modern Britain and Ireland

By Alexandra Walsham
New York: Oxford University Press, 2011

Tumultuous religious changes in the mid-sixteenth century, occasioned by the Reformation, had a profound impact on how people regarded the physical environment of Britain and Ireland. In her wide-ranging and powerfully documented book, Alexandra Walsham examines the highly charged relationship between belief and landscape, arguing that the cultural practices established during this period fixed perceptions for the next two hundred and fifty years. Her success in unraveling this rich history affords numerous new insights into the bitter and often bloody struggles between Catholics and Protestants, during which monasteries were suppressed, gardens savaged, historical sites wrecked, and monuments in town and country destroyed.



Walsham's history is in step with works like Keith Thomas's *Man and the Natural World* (1983) and Simon Schama's *Landscape and Memory* (1995). Unlike the French *annalistes* who see topography as a deterministic influence on society, or

the more fashionable geographers and anthropologists who focus on theories of cultural construction, Walsham explores Protestant and Catholic documentary texts to reveal their differing con-

ceptualizations of mountains, forests, woods, groves, springs, standing stones, rocks, caves, and other natural phenomena. The enduring magnetism of these features as prompters of the spiritual, however, confounds the strictly rational or scientific. Far from being eradicated as Protestant zealots intended, monuments within the topography such as shattered wayside crosses and chapels underwent a transformation into reanimated sites of visits and veneration.

The book starts with a survey of religious attitudes toward the landscape from prehistory through the medieval period. Using shrines, sanctuaries, miracles, and pilgrimage as themes, Walsham explores how religious assumptions influenced contemporary perceptions of the physical environment and how these, in turn, underwent theological and cultural transformation. Antiquity's practice of reusing sanctified sites was continued in the early centuries of Christianity, proving the truism "once a holy place, always a holy place." Even where few material traces remain, place-names and church dedications hint at continuity (and reversals). Outside England, numerous countries furnish examples to add to Walsham's. In Rome, for instance, the Pantheon was transformed into Santa Maria Rotundo in the Middle Ages and returned to its original dedication a thousand years later. A stone's throw away, the Dominicans' imposing Santa Maria sopra Minerva translates literally as Santa Maria 'above' the pagan temple of Minerva. It was only in the later medieval period that new holy sites emerged – Walsham calls them "territories of grace" – and then usually to commemorate the locus of the miraculous.

With the advent of the Reformation, Luther and Calvin rejected notions that the material world was capa-

ble of transmitting salvation, thereby undermining ideas about the immanence of the holy. The landscape became an ideological battleground for competing theological positions. Topographical features which for centuries had drawn the faithful – such as sacred trees, healing wells and waters, and apparitions in dells and woods – were now seen as obstacles to the advancement of the Gospels. Christian as well as prehistoric monuments became the object of zealotry at the hands first of Protestants and later of Puritans. Purging the countryside of such false devotion was justified as a release from superstition. Holiness lay in the faith of those gathered, no matter where this occurred; salvation depended on the message of the scriptures.

Not surprisingly, Protestant iconoclasm extended beyond Christianity. Heathen monuments, such as prehistoric sites like Stonehenge and Avebury, the megaliths in Wales, or Scotland's standing stones and cairns, attracted the attentions of reforming radicals. Fortunately, the rise of antiquarian interests provided some measure of protection. The pictorial and didactic consequences of these theological disputes continued well into the eighteenth century.

Monastic ruins, for instance, may have served as set pieces in panoramic landscapes expected to stir picturesque sensibilities, but they also affirmed Protestantism's triumphalist narrative of victory over the devil and Antichrist.

Catholic reaction to Protestant assaults is far less known, and Walsham gives a moving account of Counter-Reformation renewal. As the now-suppressed minority struggled to adapt, persecution ironically stimulated piety. Improbably, a geography of the sacred emerged even at sites such as Tyburn in London (modern-day Marble Arch), where flower garlands were placed on the gibbets used for hangings as a tribute to Catholic martyrdom. New reform movements such as the Jesuits also encouraged a re-sacralizing of the landscape as part of a larger revival of devotional practices, many of which were associated with saints' cults and relics in step with Counter-Reformation orthodoxy. Displaced from their wrecked church buildings, the faithful adapted their ruins to alfresco locations for Mass and penance, heedless of evangelical assertions that the Lord was no respecter of places. Groves and woods also served as havens from repression and as enclaves of worship. Members of the recusant nobility were sometimes part of these manifes-

tations of piety, and their involvement would certainly have influenced these courageous and sometimes brazen assertions of religious tradition. How widespread these practices were may be debated. A good deal of Walsham's evidence comes from Scotland, Wales, Ireland, and the north of England where the Reformation had a harder time imposing its iconoclastic will.

A hundred years after the Reformation, the Commonwealth witnessed a return of violence and destruction. Old oppositions of Protestant/Catholic were now revived as Puritan/Royalist, and the addition of political and class tensions had explosive consequences for structures and sites in both town and country. Formal gardens on aristocratic estates created during the Renaissance and Mannerist eras, for example, became suspect not only as emblems of absolutism but also for their association with Catholic France and Italy.

At the same time, the human impulse to re-sacralize space is an enduring one with an important and paradoxical history. Holy wells and sacred springs, for example, may have been debunked by scientists and academics and denounced by clergy, but they have never lost their power to attract. Reinvented as spas (and

more recently as health resorts), centers like Harrogate and nearby Knaresborough in the north or Tunbridge Wells in the south underwent dramatic civic growth. Philosophical and medicinal opinion promoted the mineral merits of hydrotherapy and thus supplanted the classical and medieval humoral hypothesis of sickness advanced by Galen. And the longevity of popular folklore or lingering mythology discussed by Walsham could be traced even farther, to the present day: witness the contemporary craze for bottled waters. Is it an accident that one of the most popular brands, San Pellegrino (literally, "holy pilgrim"), carries a potent echo of a not-so-distant past?

Walsham draws out her themes and examples from primary sources contemporary to the period, of which more than eight hundred appear in her bibliography. She is just as prodigiously well-read in the secondary literature, although here, irritatingly, Oxford University Press foregoes a separate bibliography and, just as frustrating, an index. Readers are thus left to recall references among the more than seventeen hundred footnotes, many with a dozen or more citations, and locations among six hundred plus pages of text. A similarly parsimonious approach governs the press's spare

allocation of illustrations. Color is restricted to the book's jacket, which features one of Turner's views of Tintern Abbey. In their absence the reader has to deal with often dreary black-and-white images for the modest fifty-two figures. The freshness of Walsham's study deserves better.

With its lucid argument, clear writing, and command of a large literature, *The Reformation of the Landscape* makes an important contribution to Britain's history in this period; for North America, the legacies and repercussions remain for others to explore. After all, our Puritan forefathers' ideas about the new physical world they encountered sprang from the intense, bad-tempered debates of the sixteenth and seventeenth centuries. New England subsequently became the locus for concepts rooted in the divinity found in nature (transcendentalism), despite society's engagement with an environment far more hostile than had been expected. In fact, the New World's notions about technology, capitalism, literacy, and creationism all have their antecedents in the period Walsham boldly opens up for our understanding.

— Peter Fergusson

Contributors

William deBuys is a conservationist and writer based in northern New Mexico. His seven books include *River of Traps*, which was a 1991 Pulitzer finalist, and *The Walk*, an excerpt from which won a Pushcart Prize in 2008. He was a 2008–2009 Guggenheim Fellow.

Paula Deitz is editor of *The Hudson Review*, a magazine of literature and the arts published in New York City. She writes about art, architecture, and landscape design for newspapers and magazines here and abroad. *Of Gardens*, a collection of her essays, was published last year by the University of Pennsylvania Press.

Peter Fergusson is a professor emeritus in the department of art at Wellesley College. His books include *The Landscape and Architecture of Wellesley College* (2000), *Rievaulx Abbey: Community, Architecture, Memory* (1999), *Architecture of Solitude: Cistercian Abbeys in Twelfth-Century England* (1984), and *Canterbury Cathedral Priory in the Age of Becket* (2011). He is a Fellow of the Society of Antiquaries of London and of the Medieval Academy of America.

Aimée Brown Price is an art historian and independent scholar who has lectured widely at museums and universities including the National Gallery, London; the Art Institute of Chicago; the Institut d'Art et d'Archéologie of the University of Paris; Edinburgh University; the Pushkin Museum; the New York Studio School; Oxford and Cambridge Universities; the Musée des Beaux-Arts, Amiens; and Smith College. She has taught at Caltech, Princeton University, and the Graduate Center of the City University of New York. Following the publication of her two-volume monograph and catalogue raisonné of the painted works of Pierre Puvis de Chavannes (Yale University Press, 2010), the French nation awarded her the rank of Chevalier of Arts and Letters.

Barbara Ras is the author of *The Last Skin, One Hidden Stuff, and Bite Every Sorrow*, which won the Walt Whitman Award and the Kate Tufts Discovery Award. She is the director of Trinity University Press in San Antonio, Texas.

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Contributors:
William deBuys
Paula Deitz
Peter Fergusson
Aimée Brown Price
Barbara Ras

For more information about the
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