

Joseph McElroy

Wetland Reflections

People live here, of course; and close by. The apartment dwellings are visible if you look. Still, amid this population and from my vantage, it is another element I contemplate. Where Eastern Boulevard Bridge carrying the Bruckner Expressway across the Bronx River connects two sections, even neighborhoods, of the south Bronx, you are unlikely to glance out your window, driving east or west, to mark the glimmering, quite narrow road of water below. If you are walking the bridge, going home from work or with your child, you can pause to see to the south this substantial stream bending left as it approaches its mouth just out of sight, a mile away, joining estuaries with the East River. Nearer at hand, Cube Smart Self-Storage, scrap metal warehouses, flats fixed, body work, a car-wash, a U-Haul, Gulf station, checks cashed, a paper-recycling facility are for the eye like the city sounds that can seem to hide the river. Yet in the near distance, in a boat slipping past a dilapidated two-story industrial building, three or four young people rowing pause, like a distinct exception, as the person with the sweep oar in the stern, a woman, addresses them, and you can feel some waterborne privacy of the talk you can't hear.

If you are walking the north pedestrian side of the bridge you may pause at the parapet, the comparatively clear current (for the river has seen worse days) passing thirty feet below, and look upstream and find odd, on the west shore flanked by the Sheridan Expressway and below it Amtrak rails, what appear to be, and are, the giant, sculpturesque, once functional structures—silos, hoppers, conveyors—of a batch-mix concrete plant, sand-colored, salmon-pink, a Martian-surface hue depending on the light, reminiscent of early 1960s Antonioni. Abandoned in the mid-1940s to become a convenient dumping site, now restored as a park, Concrete Plant runs narrowly and in late

winter starkly along the west bank of the river, the long curving, dipping, and rising promenade foregrounded by cement benches, a boat launch, and an extensive railed observation level.

What is there to observe? you might ask—a gull standing on its two feet on top of a derelict dock post, a floating boom of red-and-black plastic buoys strung across the river to catch trash drifting down—egg cartons, a sneaker, sticks, green bottles, a flotsam log. Bit by bit, though, the River on the move is improved; by increments, we like to say, a buzzword derived from growth, which, in our experience, is not only at speed but at different speeds, and often requiring a slowing down or a condensing of scale; seventy-five yards across on the far side jumbled, dark rocks drably almost unnatural gnarl the bank, broken windows of storage sheds out of *The Silence of the Lambs* backing onto the river, caving metal walls, junked cars beyond, and beyond them billboards, Laundromat, car rental; obscure tenements, a neighborhood population, though in the distance way over east several impressive apartment projects, outposts almost remote, co-ops, I'm told, stand at the edge of an expanse of often empty park, Sound View. But here, like some rampart, the west-facing side of the 450-foot-long ABC Carpet and Home Warehouse Outlet blankly shadows its riverbank into insignificance. Or did until the summer before last.

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One afternoon in February 2010, Lillian Ball, an environmental restoration naturalist and an artist, forthright or curious, as the case might be, took in this view with two colleagues. One of them, a Parks Department engineer, was showing her Concrete Plant Park, he thought, where they were standing. A project for her here maybe. An area on this west bank of the river to improve, where a salt marsh restoration had been undertaken with the Park—perhaps to replant, as she had done as part of a meticulous wetland buffer zone in her boat-ramp park project at Mattituck Inlet on the North Fork of Long Island the year before in a project she had named WATERWASH.

Now, a likely larger job—with the implications of a unique New York river—or at least adding *to* a larger job; for Concrete Plant extends seven acres from the Bruckner to Westchester Avenue. Well-named—if literally suggesting its hard-edged industrial past—it offers some routine lawns, a stepped ramp to launch canoes and kayaks stored here into the Bronx River corridor, long, paved walkways which especially in the off-season offer a raw-framed privacy even with the cars on the expressway and exit ramp and periodic sounds of the passing #6 train. Opened in 2009, the park’s main excavation and construction work was now done, though it could use some landscaping along its southern, rock-strewn, sometimes littered shore.

The Parks engineer pointed out a drywell originally intended for stormwater redistribution in an undeveloped stretch of the park down toward the bridge. Looking across the river at the narrow east bank, Lillian Ball had a different idea, for a site in greater need. It took some seeing, that tangled, meager, used and disused, yet potential place of landfill squeezed up against the ABC warehouse, upwards of two hundred yards of forgotten shore, those dominating and largely non-contributing plants generally called invasives, doubtless poison ivy everywhere, and crowded together down near the bridge a few small anonymous trees—black locust, European alder, is it erstwhile city survivor ailanthus?—unmistakably some thirsty, struggling white poplar. And, as it turned out later on closer inspection, a tiny overgrown patio of chipped cement tiles; yet too at the south end, just beyond the building, a steep little rise from the riverbank to an upper level area, which extends from the warehouse clear to a fence, graffitied in those days, between ABC property and the bridge.

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So the space at the south end had topography, and Lillian would give it some more. Trained as an anthropologist, she had been working with water for thirty years here and abroad, was a sculptor (of an ice globe illustrating planet warming), as well as an installation and land remediation designer, wetland botanist, photographer, word-spreader—a woman, as she puts it, “crazy for wetlands.” As you went back down the incline from the projected and eventual new entrance off Eastern Boulevard

Bridge, but by “a fluid sparkling blue recycled glass pathway,” as Lillian would design and later describe it, and around the southwest corner of the ABC warehouse, this further stretch of riverbank she would clean up would unfold as the site of a constructed wetland, one hundred and thirty feet long parallel to the shore, and twenty-five feet wide—the central embodied meaning of Lillian’s project. This spine or vegetated nervous system or digestive tract (though we may for the moment doubt the analogies) or fount, call it, of a renewed habitat was to stabilize the shoreline and, as we will see or be told and learn and then imagine, detox or at least somewhat clean the stormwater outfalls before they enter the river.

The flat roofs of the ABC warehouse, thought to spill rains down onto the bank to mix with ground pollutants and wash them into the river, were instead later repurposed by another organization to become a rain-gauged “garden” of thirty-five large oblong very shallow planters (a project that surprisingly got a \$350,000 grant also). But the serious runoff was at the north end of the building, where, in the event of rain storms, overflows would creep down the almost four-degree slant of the company’s thirty-thousand-square-foot parking lot from Bronx River Avenue, a “first flush” (first inch of a heavy rain) bringing petroleum residues, antifreeze, other pollutant chemicals, and construction-site sediment runoff more or less directly into the river. These natural and human pollutions among others often diffuse in origin were distinguished by the EPA in the 1980s from discrete effluents (such as those from pipe, ditch, well) designated in the optimistically named Clean Water Act of 1972. In so many respects ineffectual, it did acknowledge wetlands—sometimes small areas of low ground behind beaches or in backyards, often estuarial ecosystems bringing land and water together overlappingly, interpenetratingly, bodily, ambiguously, and thus perhaps uneasily for our thinking: *wet lands*, enormously productive for wildlife worldwide and of greater interest to naturalists than to governments, even land itself yielding fresh reflections through its mingling with water—do these wetlands, inherently dynamic, potentially divided, return us to ourselves?

Deposited into ground waters between saturated soil and rock by runoff, where do pollutions go when they are slowed down and diverted into a wetland? In theory are they safely stored? Or altered,

degraded? How to interrupt stormwater coming off the ABC parking lot carrying these diffuse-source pollutants and divert the flow southward along the shore into the wetland?

From Lillian Ball and from several of the professional specialists she brought in—Bob Governale, geologist and contractor who excavated and replaced soil and did the grading and installed the recycled-glass pathway and the weirs; Eric Rothstein, an independent hydrologist and site designer, formerly with the Parks Department natural resources department, and, with his associate, Amanda Bailey, pragmatically knowledgeable about the use of plants to clean polluted stormwater; and, likewise an engineer and designer, Franco Montalto, from Drexel University, who developed the hydrological monitoring program—I have learned to identify what I have seen with my eyes and what I have not actually seen beneath the surface on visits to the site. At the west end of the parking lot near the river, catch basins receive the stormwater, submersible pumps raise it to a receiving manifold conduit, thence out of the lot and into a six-inch polyethylene pipe, flexible, with no joints needed for the continuous run to the wetland. More precisely, to an eleven-foot trough-like flume to monitor the flow into the wetland. Which is not always wet; but if too wet, adverse for the species of plants newly installed here to filter out pollutants. Buffered by ignorance and caution, I do my own slow thinking. Is this, beyond the announced grand purposes of this public access project, its best success? Someone's education?

But, in this project to restore a wetland to nature—so compromised globally where 50 percent of wetlands have been lost and proportionally more still in this southeast Bronx, much of it wetland into the mid-1940s since “reclaimed” like the Sound View salt marshes or filled in by industry—what am I to make of the black synthetic rubber edges running the length of this “made” wetland of ours, a liner four feet deep, I'm told? Why this lining? my outer Thoreau must ask, flummoxed at times by this threatened but rich, environmentally ideological culture, holistic but sometimes self-righteous? A dead product, it does not grow here, nor will it degrade; it was laid in to keep the wetland wet and help the plants thrive, plants that will filter pollutants from the stormwater, lest the stormwater arriving by pipe and flume simply soak down into the earth.

Upland from here, well beyond the south end of the wetland and around the corner of the ABC building, we want rainwater, by contrast, to *seep in*. Not running off an impermeable surface—like drought-baked land in Arizona receiving a cloudburst—but down through a path pavement of porous recycled ground glass held together by a two-part urethane glue made from 60 percent plant resin.

So, back in the wetland, to make sure gravity pulls stormwater through, more than down, why should we not contain it with an impervious liner manufactured of a synthetic copolymer of ethylene and propylene with diene double bonds to cross-link long polymer chains, and give our synthetic an elasticity and a durability and so much else that “real” rubber does not have? What was I expecting? Veblen said technology is neutral—what matters is the use it’s put to. But this membrane from Firestone, family relation to tires fished out of the river upstream by the hundred, will be here for fifty years, stretched, doubtless, but not ripping—its polymer chemistry way superior to natural rubber’s also in resisting ozone. Is it a stretch, recalling with a changed sense of the seventeenth-century words Sir Thomas Browne’s seductive “all things are artificial” for “nature is the Art of God,” to decide it’s natural to go with what we have?

What is a natural process then? this “made” wetland makes me ask. Why, anything we can engineer that has (probably) no adverse environmental impact. We have unthinkably fouled if not destroyed the ground we stand on, if not the very grounds of our intelligence in our intelligent seizing of resources. But our intelligence, which is also a group intelligence, can maybe restore with experience and invention what that same intelligence devised, like a “corpse you planted last year”—the phrase in one of T. S. Eliot’s voices speaking in 1922 of spiritual, though often in his poem urban, waste lands (which is how *wetlands* have often been thought of by those who’ve filled them in). We build dams in Oregon and later tear them down: is it because we’re thinking better? seeing what we couldn’t see before?

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I'm looking at a photograph of Lillian and some of her younger coworkers lined up in two rows on the transformed earth of that only apparently small-scale WATERWASH ABC project during its completion late the summer before last. An acute wedge of river behind them, above its length in the top of the picture we see a bright strip of the Concrete Plant Park riverbank across the way. Virtually at their feet here on the east bank, as if to explain the proud smiles, an end loop of this sandy-soil wetland, a piece of the project's central spine, is bordered by new switchgrass plantings in bunches, and, islanded inside the loop, a raised overflow drain seems covered like a manhole. I know there's a length of five-foot pipe vertically sunk beneath it and a long horizontal subterranean pipe that it meets; thus, unseen by the public, future stormwater overflow becomes outflow plumbed riverward.

What is in the picture? White netting, removed in the foreground for the photo, is visible down to the right to keep the geese off the tender young plants, an idea Lillian got from a grape farmer at a Long Island winery. Several of her temporary workers are maritime apprentices from Rocking the Boat—a nonprofit Bronx River organization that serves South Bronx youth in extraordinary ways, boat-handling training, science programs out on the water every week monitoring projects in the lower estuary, and professional-level boat building—here ashore planting plugs, clearing invasives, working and learning, and paid.

An adviser had recommended that Lillian save time and hire professionals to put the plants in. She chose the slower way, which is a quite different kind of slowness from the pivotal slowing down of stormwater diverted into and through a treatment wetland that lets it percolate through native plants and soak in for twenty-four-hour periods after a storm rather than pass directly into the river: yet the slowness analogy lingers in this project (in fact completed in only four months), some wider ecology taking several forms, like experience precipitated by our relation to water itself and to what our potentially indigenous hands can do, as patiently as one of these young workers massaging the roots of a soft-stem bulrush before planting.

Educational outreach—in the gentle jargon for projects like this one—began in Lillian’s vision not only with the constructed wetland and “waterfront park,” which opened to the public the summer before last, teaching visitors an alphabet of this place; but in its making and becoming, worked day by day through that previous summer by teams of hands who might find out again how to make something worth making, that might last with our sustainable help, and why it is worth making; not unlike this writer writing what he thinks he knows about bulrushes growing bacteria and exuding antibiotics, about brilliant, pollution-hardy seaside goldenrod, and about real people in groups; but also writing what he’s learning; or like finding in a picture I’ve been told by one high-profile environmentalist is worth a thousand words, every *reason* for words, and finding it also beyond the frame of the photo, even this same shot that we find in Lillian’s self-styled “unique interpretive signage,” but there with Lillian curiously missing from it, who has told me all this is for WATERWASH, not for her. Well, WATERWASH®.

Cut off in the photo, the loop at this south end of the wetland might suggest beyond the frame curving shapes quite other than the line of the initially trenched, lined bed of the constructed wetland itself, one hundred and thirty feet long, roughly twenty-five wide, at each end slightly tapered outward; yet curves are to be found in the other direction, up the hill around the corner of the ABC building, as Lillian shaped the descending approach. I have walked them, where, like a switchback, an S-shape of permeable blue-graygreen recycled glass loops its prudent path among native plants and new sandy soil, somewhat vulnerable, almost like the complex cryptogamic one must not walk on in the Southwest desert. How many new plugs, all in all? Brought in in boxes. Some I might have recognized, though subtler now in winter to pick out, a dull green or less than that, some to bloom in August, some in early spring, maybe even too early if, as I try to get all this down on paper, winter comes back.

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Eight thousand native plants of some forty species by my count—is it possible, here on an obscure stretch of Bronx River shore? Of course it is. Though in the wintertime hard to identify some of them. And will they bloom? The gardener’s faith kept with loved shoots and certain roots one should massage as one lays them in. Roots in a wetland are everything. So is growth, so is slowness, so is attention. One hopes these upland or flood-plain transitional New York asters will show rays pink or violet like daisies, like salt marsh asters I’ve seen blooming late on the Cape, August, I think, and much longer ago when I was stationed at a Coast Guard lifeboat station during the Korean war; not like Mojave asters I’ve seen in rocky Arizona without guessing their name whose pink rays by contrast thrust up cuplike. Butterfly weed in Lillian’s Mattituck project reappears here at WATERWASH ABC to bloom, I hope, with red-striped orange flowers—liking the margins of streams, sand or gravel (though the wetland liner doesn’t like gravel, we must remember), and cousin hard to believe to a Paint Brush I have seen in a Hopi village near where I worked planting beans in a field below the Sacred Mesas thirty years ago, the red found in the bracts, not in any bloom.

Lizard’s tail barely identifiable this time of year, promising a bottlebrush spike of white flowers and, more important for this water-washing project, underground runners—a moist soil plant; marshes I recall. Only green now, in winter, in the planting zones, or grayish green, or is it sometimes almost drab bluish? And the large arrow-shaped leaves of the perennial arum, I believe, down near the water, the gray-green stems of what may grow to be high bulrushes. Also, buttonbush, near the ABC wall and, I’ve been told, especially effective at absorbing pollutants; hardly yet a tall nesting place perhaps several seasons away for what birds I’m not sure, a local warbler, though the insects are here—I’ve seen a small, dark, yellow-rump warbler in the Botanic Garden upstream late fall, the river itself remembering its geography for me.

In its detail and turn from wetland to upland population, Lillian’s terrain proves somehow spacious. Her attention creates even from my life a field of recollected geographical space, country I know (and what I didn’t know till recently—that this whole east edge of the Bronx River was wetlands in 1948, a

photo hard to believe, a time when I, a born Brooklynite, was far away working on a ranch in California, irrigating a field of sudan grass for cattle feed well before it was known to be a filter against pollution), for, yes, this small WATERWASH ABC microcosm is of time too, contained with a natural art never quite completed, a plainness, an unslick economy when you see it, belying the daily work and Lillian the project manager's self-described obsession that went into this job, "cruel" she says she was, though one can't quite mean it of oneself. "My babies," she calls her sometimes struggling young plants and her restoration projects, sustainable even to telling us what sustainable entails. And for me, touching in how it will be or must be sustained, for everything else here is working, too.

It is the roots we come back to—where these slow plants will do the work we hope of them: to draw out, filter out, *extract* toxins from stormwater in its buffer-delayed advance so that in its ground-seeping, but in this project primarily wetland, passage riverward it may arrive cleaner than when it ran off Bronx River Avenue down onto the ABC parking lot's nonpermeable surface on the way, then, to the river.

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Lillian's film-strip-style signs sample facts and themes that may help visitors. I am concerned that facts not bemuse me with authority but link other facts and create questions. Questions are as much the core of education as information. Once I used the term "wastewater" by mistake. This wetland project is not at all the same as for wastewater, Lillian sharply reminded me. No doubt true. Yet we are talking treatment of contaminated soil or water with green plants, their natural capacity to absorb or change pollutants (and thus obviate expensive removal of contaminated soil to landfills). But, let alone ancient Chinese and Egyptian wastewater wetlands and a wonderful 1904 letter from New South Wales I came across telling how to plant, in effect, a small backyard wastewater wetland with arum lilies for their pollution-absorptive roots, it was from wastewater treatment systems dating back to research here and in Europe, from the 1950s, that stormwater runoff treatment has

developed. Slowly, though; because stormwater wetlands have been less susceptible to long-term predictions.

Which plants will work for us? Specifics overlap between boneset and pickerelweed with their idiosyncrasies I'm learning, and otherwise reputedly effective blue flag iris's roots are poisonous for some visitors; small-scale microbe, large-scale tree, thirsty poplar—unhealthily earthed at the ABC shore, where an old rag of carpet was dug out near a polluted vegetable patch.

And how measurably much pollution do plants take out, or up? I wonder. And in the perennials, what happens to the pollutants in the long run? Stored, returned to ground, to river, to food chain? So some pollutants are transferred to the plants only for the time being? I asked Damian Griffin, the education director of the Bronx River Alliance, who agreed it was a question and said he had no real answer to it.

When I am told that plants clean contaminants from stormwater, I am glad to hear it. I read reports from Canada about success with switchgrass, though sometimes it seems all one can be with these hidden-seeming events is a believer. (Or a denier.) What is it that's so satisfying here? The beauty of it. A natural bargain: for once, we've had to do almost not a thing. Economy that is almost a steal. Plants with a virtual gene for activism. Is it some osmotic magic to go with the plant's hydraulic pump? Work done inside the slender stem, the vulnerable upper body of the plant?

A lowly white-flowering wildflower, pointed out to me once on a trip with my daughter in a forest in eastern Washington, the alpine pennycress, is an almost unimaginable "hyperaccumulator," as it is identified by plant biologists like Leon Kochian at Cornell, and has been proven in a Pennsylvania EPA test with help from compost for its ability to extract from compromised soil and tolerate and store the heavy metals cadmium and zinc, and apparently uranium as well. I read that sunflowers absorbed radiation from a pond near Chernobyl. Enzymes plants secrete may directly attack and, as

I've been taught, break down complex molecules of organic pollutants into simpler molecules that may find their way into plant tissue to help the plant grow.

These are perhaps the front lines of phytoremediation (the use of plants to extract pollutants from soil and water)—which extend to Patagonia, to China, to Denmark; to the labs of Om Parkash at University of Massachusetts, Amherst, who, among other surprises I am coming to, explains to me how, albeit with limited internal pathways, a plant may change the valency state of a pollutant compound—its molecular stability revised out to the very electrons in its outer shell. A plant biologist at Colorado State University, Elizabeth Pilon-Smits, who distinguishes between phytoremediation (the less comprehensive term) and bioremediation, which includes crucially the symbiosis of microorganisms with plant roots, has outlined for me limits of on-site soil and water remediation and the divided habits, if not vagaries, of the plant enzyme that fixes carbon.

Yet the plants newly installed at many small-scale projects like WATERWASH ABC occupy this environmental frontier as well. I get closer to the process of vital and polluted solutions entering roots yet I perhaps merely put into words what we grasp but do not see (like the capillary action of water circulating in soil and root masses—which is “really” chemical bonding between the exposed hydrogen nuclei of water molecules and available oxygen atoms, thus water’s almost canny power to adhere to, or, as we say, wet, soil and other substances). It seems also likely that the press releases I have seen for various estimable projects in India, Idaho, Saskatoon, and New York encourage me to believe that what I’m being told is all there is I need to know. Science gets my ear—whatever “science” is—but it inches along in meanders as also by unpredictable jumps. And I, my poetry not at all flagging, want to know how the plants do it—for isn’t this officially the most important thing of all in this project of Lillian Ball’s (to judge from what I’ve been told and what I read on her color-photo-and-caption signage)? Our own hands-on collaboration becomes inseparable from hidden symbioses (*are* they inanimate?) between microbe and plant.

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As above, not so below, I want to say, because it's often the microbes we're talking about (to get closer to the fact—microbes eating petroleum residues, for example, as they were found to do in the Gulf of Mexico after the BP disaster), digesting toxins here at WATERWASH ABC, it is predicted, into carbon dioxide and water. Let these microorganisms consume what we can't and even give us back what we can consume, like oxygen.

So, is it the microbes, not the plants, that do the actual biochemistry of organic pollutant degradation? At least the microbes that do much better in soils and sediments that have lots of roots—because the roots feed the microbes. Roots exude carbohydrates that bacteria and fungi need, we still learn in high school. These organisms living in the dark, an ecology professor at Columbia, Shahid Naeen, reminds me, cannot photosynthesize, so they need access to organic carbon, which plants, getting what they need from photosynthesis, provide not only through the litter, or dead roots and plant material that enter soil and sediment, but also in sugars, alcohols, and acids exuded through living roots. “It's tough to know who's doing what but it does seem to work,” Naeen observes, whether the bacteria or the plants are the chemical engineers. So it is true that microbes by the billions attach to certain plant roots and may (or may not) draw contaminants of many sorts from WATERWASH stormwater in all its slow seepage before it can reach the Bronx River.

The global scope of research in this area is buoyed by intuition. From Om Parkash I learn about his use of the so-called “green liver model,” outlined by Heinrich Sandermann in Munich a generation ago, by which plants metabolize foreign pollutants in three phases strikingly like detox sequences in our own liver. Through enzymes they divide the parts of the pollutant's molecules. The process, at best sequestering toxin into the cell wall, is slow and often incomplete. The exact likenesses to the mammal body—even green lung (plant respiration), green kidney (wetlands)—suggest who we are ecologically. Body, but I think also mind. Routinely repeated, though to me not simple, I learn again from other experts—in Portugal, India, Japan, Chile, California, New York City—that pollutants extracted from soil, wastewater, and stormwater build up in the plants, and one may want to “harvest” the plants, annuals anyway, or, upon their death, they will return everything they took up.

Good luck to the Bronx River muskrats that will eat our sometime-toxin-storing wetland plants; thus back into the food chain, agrees another Columbia University biologist, and has the toxin been mitigated? Good luck to the two beavers (known as José and Justin, names voted by indigenous online poll) seen in these lower estuarial reaches of our astonishingly often rerouted twenty-three-mile river, its very sources displaced westward to two brooks by the construction of the Kensico dam. But we try to make our luck.

And get some answers, even ones we didn't want, I'm reminded, hearing from John Lee, the great microbial ecologist at City College, not his account of how microbes absorb and metamorphose pollutants (which he tells me not to bother with, it's roughly established), but where his work with symbiosis in one-celled marine protozoa has indirectly led—i.e., annually during his winter recess to the pioneering research labs in Eilat, Israel, where in a series of seawater ponds mariculture has been brought into the food market now that we have exhausted so much ocean life. Sea bream and nutritious pickleweed are his news, the future ponds in the Israeli desert connected, polyethylene-lined, self-sustaining. Also, the risk of the Jordan River a few hundred feet away drying up like the Colorado.

John Lee knows the salt marshes of New York harbor, stresses the city's reluctance to finance quite available solutions to the gigantic sewage crisis and the need for huge national preserves to save our wildlife and at best put off water-shortage disasters in an overpopulated world awaiting our grandchildren; but now John surprises me with his dim view of small-scale projects like the Bronx River WATERWASH ABC I'm writing about. His call. World emergency demands major action. Franco Montalto, by contrast, told me of two hundred very small environmental projects last year publicly funded for New York, another two hundred for Philadelphia, a population of projects, something to believe in. The monitoring equipment he and his team installed at WATERWASH ABC in April is wired to a communications unit inside the warehouse so that Drexel in Philadelphia will have 24/7 information about rainfall and waterflow into and through the wetland, though periodic

grab samples will tell even better if the wetland is cleaning the stormwater and if this project is worth replicating elsewhere.

Chrissy Word, Program Director at Rocking the Boat, included me among her young crew in one of the Thursday afternoon patrols to measure water quality in new oyster beds and mussel racks near the mouth of the Bronx River where it meets the East River. She thinks it might be fifty years before we know if the Bronx River has been significantly cleaned by WATERWASH ABC. Upon this future the hope and fierce energy of Lillian Ball's work are bent.

Lillian was not sanguine about the work exhibited in *Rising Currents*, MoMA's 2010 show of projects for the New York–New Jersey Upper Bay. Arising in part from an architects-in-residence program at P.S.1, which gave five groups of designers, architects, and artists a chance to revisualize the New York and New Jersey coastlines around New York Harbor in ways sympathetic to the ecology of the place and responsive to the threat of a rise in sea-level, this overwhelmingly vivid and suggestive show then and subsequently quickened the global debate and generated communal thought and fresh work. Porous pavements to absorb floods in lower Manhattan due to climate change made some pragmatic sense to Lillian; but most of the designs in the show imagining ways to cope with long-term crises around the edges of the harbor for fresh water, sewage, wetland, and other infrastructure management struck her as designer fantasy at best. My own slow-learner's take on all this, like my interest in WATERWASH, is influenced by the work of the landscape architects Anuradha Mathur and Dilip da Cunha, based in Bangalore and in Philadelphia at the University of Pennsylvania Design School. Among the most interesting thinkers and practical designers in the world today in their work on water in its reciprocal relations with land, they bring new articulation to cities, harbors, rivers, and coasts in their "wet theory," meticulously stressing absorbance, resilience, and flux rather than strictly mapped boundaries and walls to control water. Their work on four continents is seen notably in estuarial projects responding to the 2005 floods in Mumbai, recorded in their exhibition and book, *SOAK* (2009), and it extends in various directions to their earlier book on the Mississippi, a historical and pragmatic reimagining of their home city of Bangalore in the Indian lower peninsula,

and design initiatives they have inspired their students to undertake in the Kidron valley near Jerusalem.

Dismissed by more than one of my activist contacts was a fine art show, *The Value of Water*, at St. John the Divine, a six-month-long exhibition of paintings, sculptures, videos, and installations throughout the enormous Cathedral's nave, its chapels, and along the walls. It is worth for me a third visit to think again about a Bill Viola video—and other thoughtful pieces by Pat Steir, Mark Rothko, Kiki Smith, Victoria Vesna. But first, elsewhere on the Cathedral grounds at Morningside Heights one Saturday in early February 2012, a panel of prominent American environmentalists present slide-illustrated discussions of their ecological restorations. These water and land works in Fargo, North Dakota, the Gulf of Maine, and Chengdu, China, to name three sites—these practical sanctuaries, places of intricate new nature, urban garden, island—are models of collaborative planning. Wetlands, too—for Lillian Ball is here, explaining her work and herself, how at some point she “couldn't make art anymore,” this other work was too important: a hundred-thousand-acre wetland in Spain, Mattituck a landscape in action. To these, she argues, an artist brings an ability to think creatively “outside the box.” The panelists have been introduced as “ecoartists”; they've all been *trained* as artists, some argument or other emerges; is it clear? Their work is so important, I wonder which art in particular they know about, have seen or heard, for example, that obliges them to call admirable utilitarian habitat restoration art. A blind poet's epic? a deaf composer's A Minor quartet? a master hydrologist's Last Supper? At a conference of geographers I have heard a U.K. professor, David Haley, in describing his watercourse-reconstruction project to renew southeast Kowloon, argue for dispensing with “problem-based,” “fetishistic” Modernism in favor of a collaborative “ecopoesis” making new “narratives” of “new processes of . . . dwelling”—in effect, art as the making of a “life support system.” Would this be to live in an artwork developing toward a century of climate change?

Not, I think, the same life imagined by Bill Viola in his ten-minute thirty-second video loop, “Isolde's Ascension (The Shape of Light in the Space after Death).” Here light penetrates dark blue waves that

seem to lift the woman's body from water depths through our own contemplation. Inescapably evoking the Tristan legend as well. Even *The Waste Land*, where life and death think their way through water toward belief.

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One late afternoon in early April I look from Concrete Plant Park across the river. I can't quite see the flume, which is blue (special-ordered—a Lillian detail). For me “flume” can mean not only an artificial channel or chute as for furnishing power or conveying logs, but a gorge or narrow defile, yet the stream flowing through it, too. And so this beautiful word reminds me what the river is—the water and the bed, motion and the watershed. Near the south end the viewing platform above and beyond the wetland and protecting it and its surrounding sandy soil from visitors has a black iron railing on three sides that came from the old Yankee Stadium. I know by heart one sign headline on the wall over there—USEFUL PLANTS THAT ALSO ABSORB TOXINS—and pictures of pickerelweed, the leaves of which, we are informed, muskrats eat, and marshmallow, whose roots “produce a sap Egyptians used to heal wounds.” Of the eight or nine lower-river Greenway parks, at a time when community groups want more connected access to them, WATERWASH ABC is the subtlest. I am wondering what public access to it will mean, how much we need a guide. Very narrow along the riverbank by the carpet warehouse and off-limits unless one were to arrive by boat, it asks the public to think not only of wetland, river, plants, and water, but of soil and path. It helps us teach ourselves the chances of renewal but also Earth's transience, and our own.