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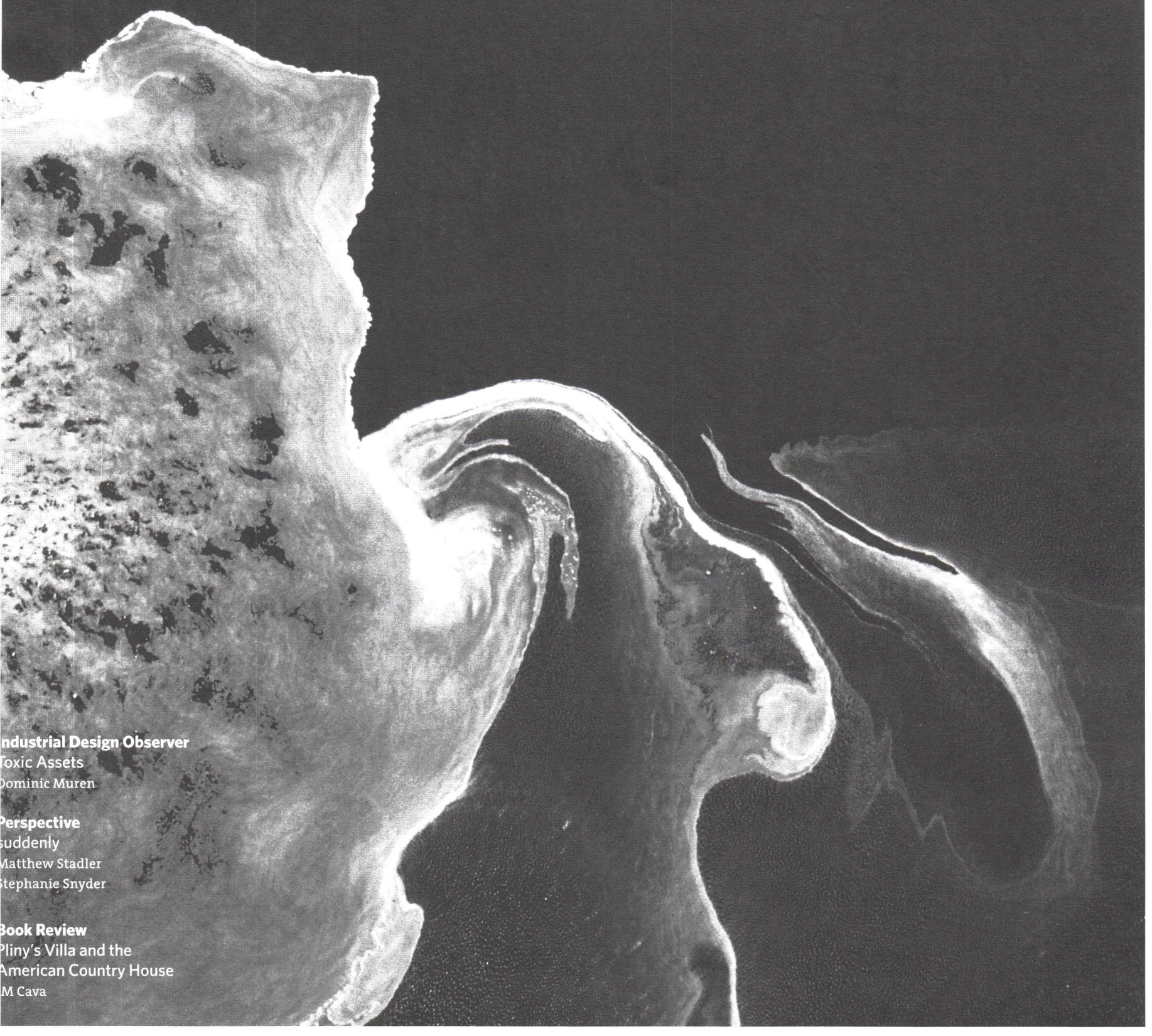

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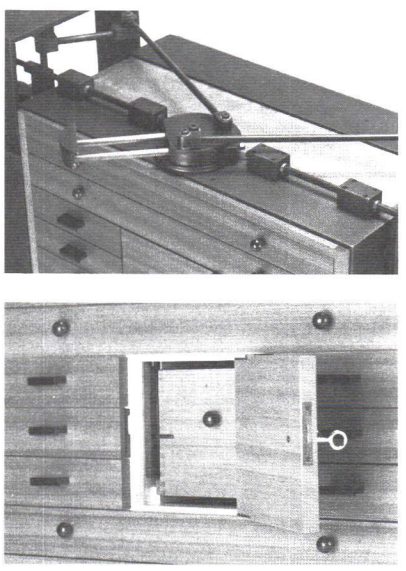

Safe, 2008 – locking jewelry cabinet, 40h x 46w x 18d, steel, bronze, Makore

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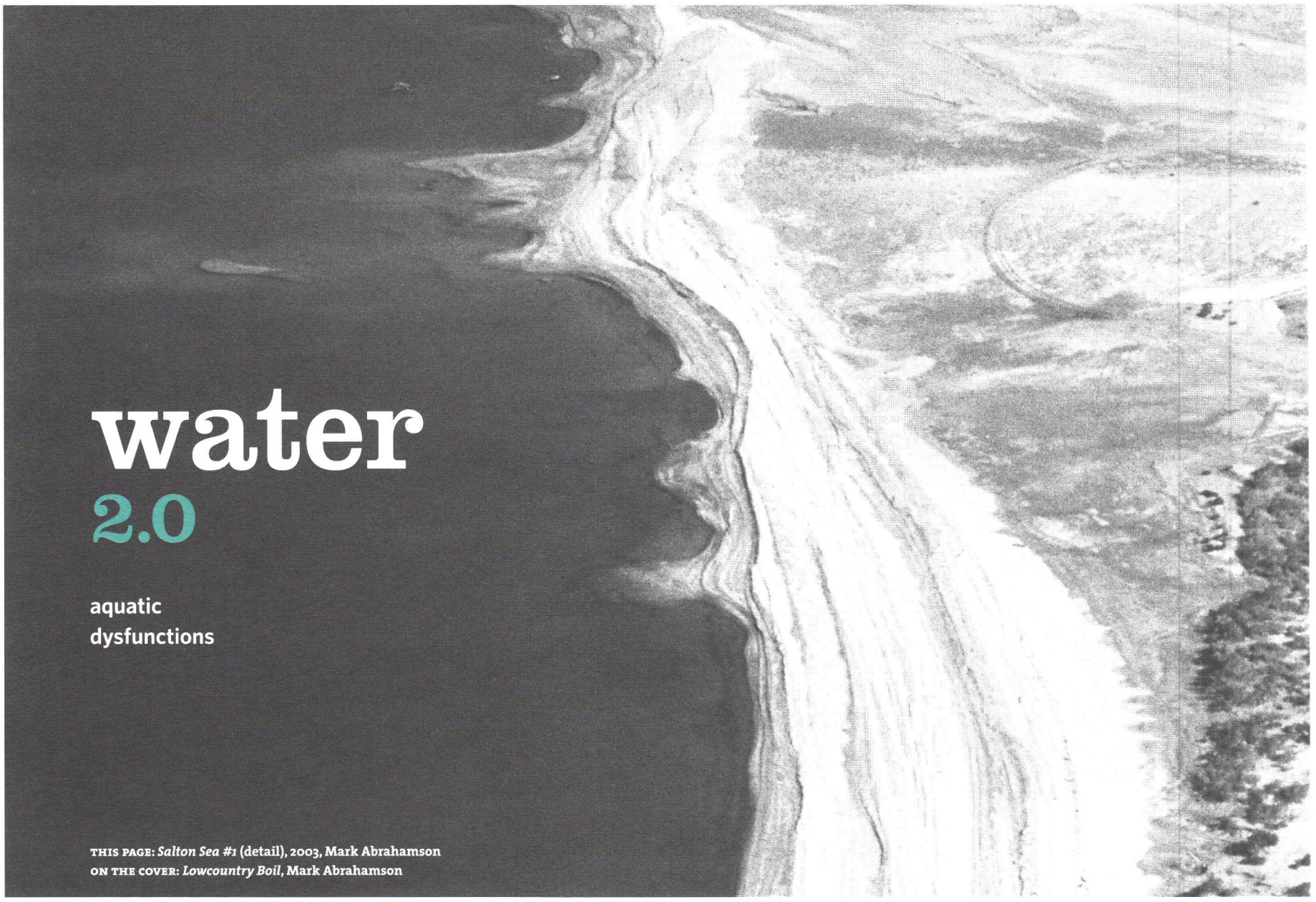

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THIS PAGE: *Salton Sea #1* (detail), 2003, Mark Abrahamson
ON THE COVER: *Lowcountry Boil*, Mark Abrahamson

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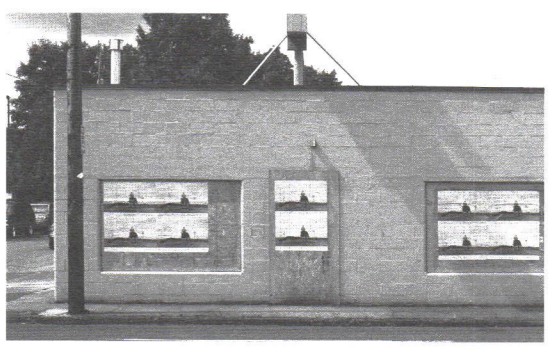

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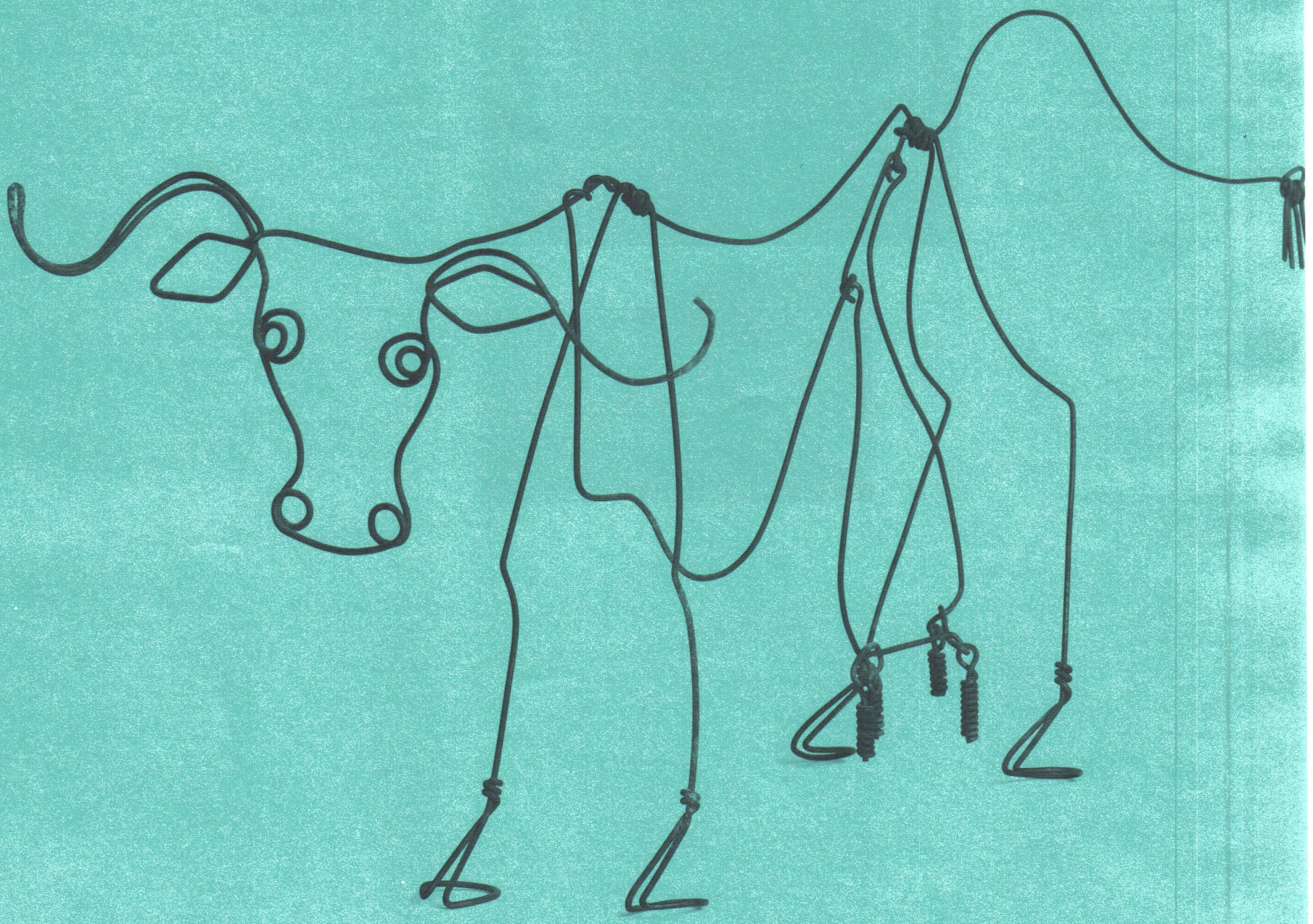

Vache (Cow), 1930, Alexander Calder, American, 1898–1976, wire, 7 x 19 x 6 in., Jon and Mary Shirley, © 2009 Calder Foundation, New York / Artists Rights Society (ARS), New York, Photo: Julian Calder

This exhibition is organized by the Seattle Art Museum. Members of the Visionary Circle (Thomas W. Barwick, Jeffrey and Susan Brotman, Barney A. Ebsworth, Jon and Mary Shirley, Virginia and Bagley Wright, Ann P. Wyckoff) have provided crucial funding to make this exhibition possible.

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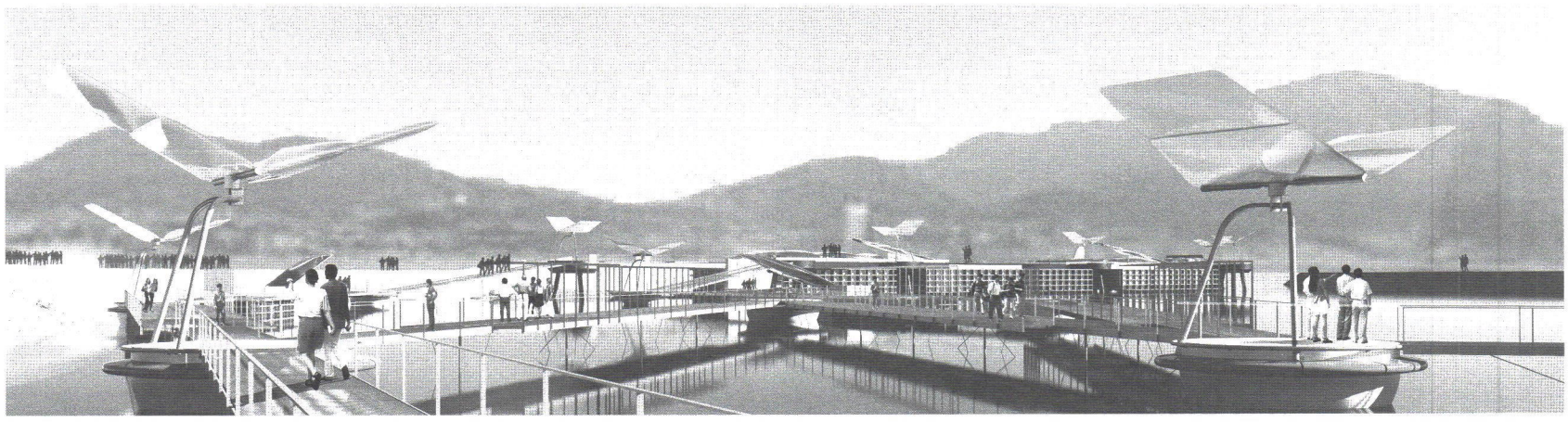


Clair Enlow

Out of the Box and onto the Ground

Awards Program Champions Urbanism, Earth

At the annual AIA Seattle awards program a year ago, some attendees were reeling from the first shocks of the recession. For this year's event, even as layoffs continue, Seattle architects kept the faith, packing into Benaroya Hall to hear the words and receive the judgment of three distinguished peers: Jurors Teddy Cruz, eStudio Cruz, San Diego; Nigel Dancey, Foster + Partners, London; and Mark Rios, Rios Clementi Hale, Los Angeles. At the event, themed "improve/improve" and moderated by Elizabeth K. Meyer (University of Virginia), four Honor Awards, five Merit Awards, three Commendations and one Citation for an unbuilt project were presented. (Co-chairs for this year's program were Don Miles, ZGF; and Shannon Nichol, Gustafson Guthrie Nichol.)

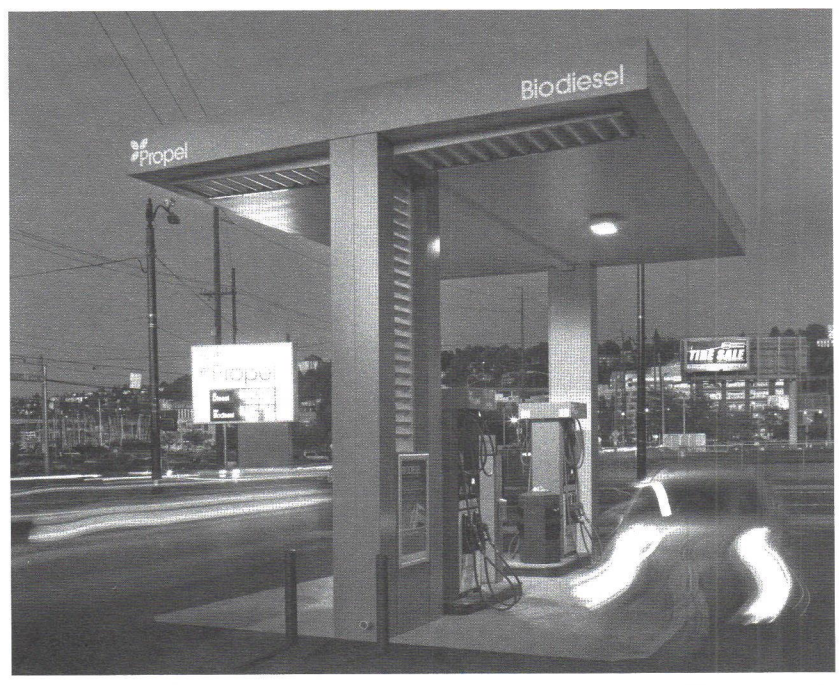
Oscar night it wasn't. The proceedings were pared to match the times. No food, no open balcony in the lobby, just a peak at the submittals on the screen and on with the show. (One frill: jazz music of the Paul Rucker Ensemble.) And when the awards got rolling, there were no exquisite retreats by Jim Cutler, Tom Kundig, or George Suyama. Among the Honor Awards, there were no houses—zero. Instead, the big winners had big similarities. They were all medium-to-large projects dedicated to community use or environmental missions (or both).

Winners included Wing Luke Asian Museum, by Olson Sundberg Kundig Allen, which convincingly reuses an impossibly partitioned and decayed historic structure; treehouse-like Mercer Slough Environmental Education Center by Jones & Jones Architects and Landscape Architects, an institutional-scale project that sits so lightly on the land the ground plane lives intact; the Vancouver Convention Centre West, Expansion by LMN, which jurors described as "the way a convention center should be done," feeling "more like a rooftop park" than a huge building; and the Grand Teton Visitor Center, by Bohlin Cywinski Jackson, a building that "really holds its own" as "a timeless fit for that site."

In the Merit Award category there were three houses: North Beach Residence by Heliotrope Architects; Waipolu Gallery by Bohlin Cywinski Jackson; and Hinoki House by Rex Hohlbein Architects. The jury also picked Topline Corporation Headquarters by NBBJ, which combines shoe manufacturing and display, and Safari Drive, a multi-family project in Arizona by The Miller|Hull Partnership.

Commendations were awarded to Conrad Prebys Music Center, University of California, San Diego by LMN; Novelty Hill Januik Winery by Mithūn; and Future Factory Upgrades by DLR Group. One unbuilt project received a Citation: BIO(da) TA, by Zero-Plus | Stave. A thematic pavilion for Yeosu Expo 2012 (South Korea), the project is partially fixed in proximity to the breakwater, with arms that flow in and out with the tidal movement.

The jury spread credit around, informally citing several entries for their reframing of density, infrastructure or typology, including a filling station for biodiesel by Atelier Jones. All of this seems to indicate a more holistic view of architecture this year—a move away from "art for art's sake" and toward more urbanism and broader science.



Top: Expo 2012 Yeosu Thematic Pavilion, BIO(da)TA: Emergence, Immersion and Environmental Integration, Zero-Plus | Stave. Above: Prototype for a biodiesel fueling station, Atelier Jones LLC.

In framing and outcome, the program reflected the interlacing concerns of traditional design disciplines.

Biographies show that Rios, a fellow with both the American Institute of Architects and the American Society of Landscape Architects, is director of the Landscape Architecture department at USC. Cruz, a Rome Prize winner, teaches "public culture and urbanism" at UC San Diego. Meyer, a fellow with the American Society of Landscape Architects is a widely published landscape theorist. Program co-chair Shannon Nichol is a landscape architect and honorary member of AIA Seattle. Of the background discussions, Nichol said, "It's about architecture, but...things are changing. Roll up your sleeves, throw out the boundaries that we are used to and use your expertise to solve the urgent problems that we need to solve."

Even though we will sooner or later find ourselves on the boom side of the economic cycle, the "bust" is not just something to be survived. It's a time to re-assess and re-imagine what it means to practice design, or anything about "improving" the environment. For architects, that means advocating not just for the client, but for the rest of us—beginning with the question: Do we really need another new building...here?

Clair Enlow is a freelance journalist and columnist for the *Seattle Daily Journal of Commerce*.

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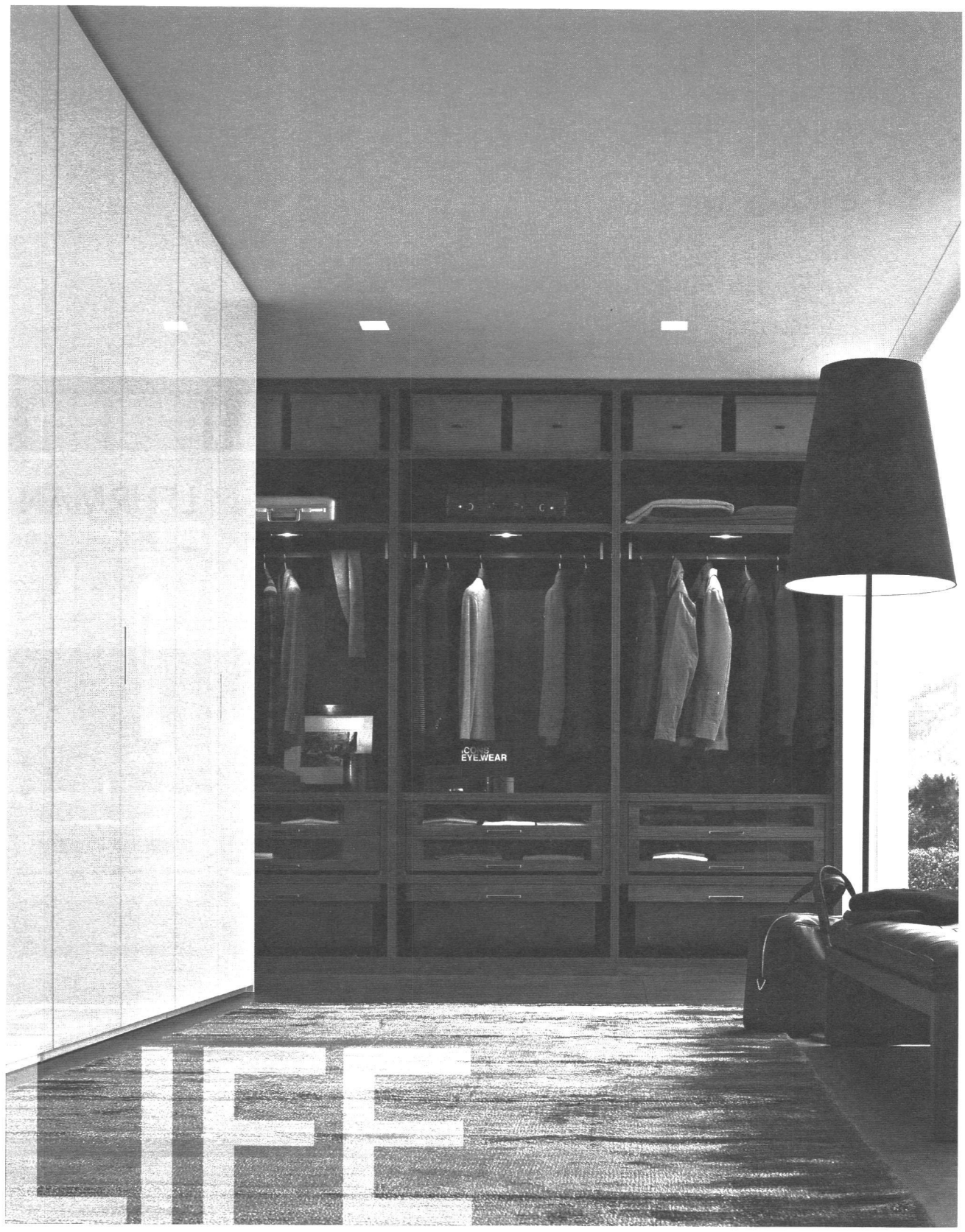

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detail from Tacoma Power's Cowlitz Salmon Hatchery exhibit design, opening in 2010

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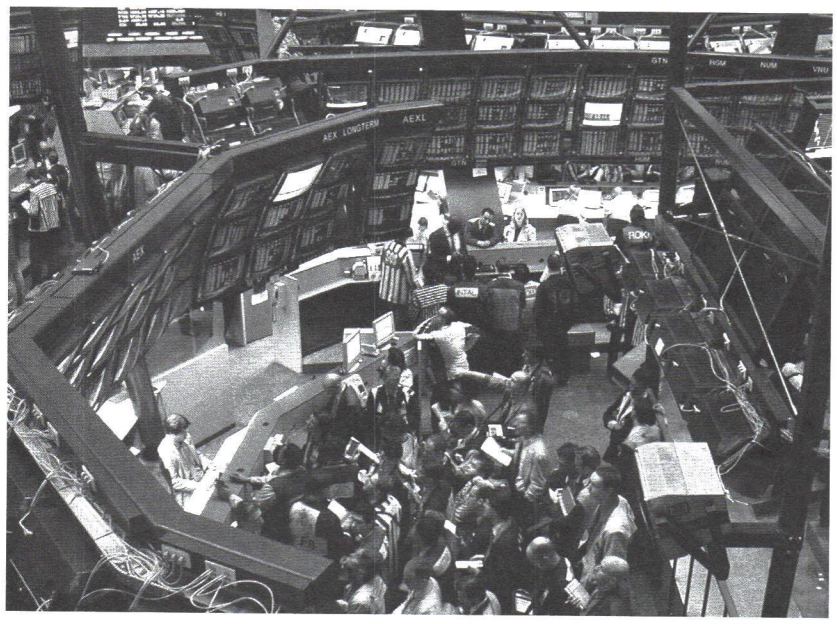
Dominic Muren

Toxic Assets

Product Design, Illiquidity, and the Next Big Crunch



Last fall, the world was stunned when AIG and many other banks were almost destroyed by something called a collateralized debt obligation (CDO). Citizens were shocked that something they had never heard of could cause such trouble. They might be more surprised to know that a similar lurking danger has been available for purchase in shops, malls and discount stores with similar potential for disaster.

Simply put, CDOs are a financial trick which allows banks to insulate themselves from the risk of debt-based assets by re-packaging lots of similar assets together, dividing them by riskiness and selling shares that payout based on that riskiness. As the concept was extended to different types of debt (even CDOs of CDOs), eventually the value of the asset underlying the dept — in this case, houses in mortgages — became less and less concrete, and therefore, potentially less and less consistent in value.

The crucial danger here is that the system based its transactions on an asset which was illiquid. Illiquid assets — like houses, cars or artwork — have low or variable market demand, which means their value varies widely, and they may sit and stagnate on the market. Conversely, liquid assets like currency, gold, diamonds or salt are traded often and in high volume, which gives them a consistent value and keeps them cycling through the market quickly. Though liquid investments offer lower rates of return, these rates are more reliable, and idle time on the market is low.

Like CDOs, consumer products are illiquid, but rather than having poor financial liquidity, they are composed of components which have poor social liquidity. A socioliquid object is composed of parts which can be re-mixed, repaired and upgraded into new objects at the end of the old object's useful life, ensuring continual high-demand. Desktop computers are highly socioliquid, being composed of inter-compatible modules. But this is an anomaly in the world of objects—most manufactured objects have proprietary parts, unified construction and minimal documentation about their inner workings. The resulting products, once broken or outmoded, are completely useless, even though 99% of their parts may still work.

Design theorists have previously tackled the issue of product death by suggesting cycles like these. Most notably, William MacDonough's *Cradle to Cradle* advocates a "technological metabolism" (perfect recyclability) and "biological metabolism" (perfect biodegradability). Frameworks like these work great when recycling plants and industrial composters are running smoothly—just as CDOs work best when homeowners are paying their mortgages. However, like CDOs, when the system is shaken, catastrophic collapse is inevitable. Consider the aftermath of natural disasters, like Hurricane Katrina in the US, or the recent typhoons in Southeast Asia. When manufacturing and distribution goes down, a radio with a recyclable housing is still useless if its tuner breaks; the illiquid object's demand — and value — has suddenly plummeted. A socioliquid product in this situation could be repaired easily by cannibalizing similar devices. Or, as in the Apollo 11 moon mission, instructions for novel, necessary equipment like CB radios, water purifiers and emergency stoves might be communicated over phone or radio and built by gathering components from devices at hand. Even in less dire everyday circumstances, users could more easily modify or tweak socioliquid objects to fit their own individual needs. Even the most finely-focused focus group won't give a multinational manufacturer the insight to make 100,000 perfect variations. Socioliquidity reduces waste and maximizes resilience of a community.

Obviously, technologies like CDOs and iPhones have significant advantages in power and profit. In the best of times, these advantages can seem like all that is important. But every once in a while, we are lucky to survive the worst of times, reminding us that no matter the immediate profit, the systems and cycles we build are what carry us through. The true value of objects to our Sociosphere is apparent, not when things are working perfectly, but when everything falls apart.

Watch Paddy Hirsh from marketplace explain CDOs here: http://www.youtube.com/watch?v=eb_R1-PqRrw.

Dominic Muren teaches Industrial Design and Design Studies at the University of Washington. His research focuses on novel methods of manufacturing using flexible machinery and local materials to make modular, hackable products for more rich, resilient economies. He is editor of Humblefacture.com, a blog exploring the development of this new mode of manufacturing.

City Building Vancouver

Trevor Boddy

Civic Aquatic

Hughes Condon Marler Architects' West Vancouver Aquatic and Community Centre

Turning suburbs into cities will be one of the most important tasks of the 21st century. Only the most distant suburbs will fail, but the rest will face the long and difficult process of turning their existing infrastructure of institutions, businesses and houses towards more intense inhabitation, not so much eliminating the automobile as turning it from urban master to ancillary servant.

In tackling these challenges, West Vancouver has the advantages of wealth but the burden of a dispersed and unfocused urban structure. West Vancouver is routinely listed as having Canada's highest or second-highest average income, but the city has no centre. The renovation of a 1970s swimming pool and large addition of recreation, cultural and wellness facilities in what is now called the West Vancouver Community Centre is a paradigm for making suburban civic centres where none existed before. The new heart of this city is designed by recreation building specialists Hughes Condon Marler Architects (HCMA) of Vancouver, with Darryl Condon the design partner for the project.

Condon's design extends the pre-existing pool under the broad sweep of a new large-radius, barrel-vault roof, a dramatic sight day or night for traffic streaming by on Marine Drive. The internal supporting structure for the HCMA south addition to the 1974 pool is a series of composite glu-lam beams, designed by acclaimed structural engineers, Fast + Epp (creators of the stunning, wooden roof for the 2010 Winter Olympics' Speed Skating Oval , etc.) At mid-span these gently curving beams are supported by V-braces in a finer-grained version of glu-lam. Like a serif-footed, capital "V" in Times Roman typeface, the brace flares out where it meets beam and floor. The final visual effect is less like typography than it is anthropometric—human heels and feet spreading out from a calf, a well-shaped shoulder taking the load from above. Condon's HCMA team opted for a quite different architectural vocabulary for the additions on the existing pool's north side, facing a pedestrian mall and ice arena. The aerobics and weight rooms are vital and busy spaces, which animate and make safer the pedestrian mall below (by virtue of "eyes on the street").

HCMA's all-new addition is organized around a three-level, glazed atrium-cum indoor civic square, edged on one end with windows granting views into the updated swimming pools and on the other by a celestory-topped galleria running slightly up-slope through the new wing to open up again at the double gymnasia. The proportions of the metallic, exterior skin are brought inside with the detailing of the roof and clerestory walls of the pedestrian spine. An unusual and attention-grabbing hybrid structure of wood and steel frames the space, each set on the same spacing as the exterior panels. Shadows from these enliven the interior space and create the dynamic effect of a forced perspective. This is accented by the brightly-coloured, tempered glass panels flanking the four bridges spanning over the pedestrian street. Set mid-span on each of these bridges is a wooden bench, making these truly social spaces, a place of relaxation for a work break or a pause before a class. Condon's team has designed a well-used and animated space, not the dull "corridor with pretensions" that is the fate of too many pedestrian streets and atria in Canadian public buildings.

The accomplishments of HCMA's West Vancouver Aquatic and Community Centre are subtle and incremental, the civic whole most definitely equaling more than the sum of its parts. This is second regard architecture, dedicated to the slow release of its thoughtful consideration, detail-by-detail, façade by façade, inside and out. Socially, the diversity of ages and publics found using the atrium and street are no accident, but the direct result of architectural decisions in plan and section that array functions together—engendering collective effects unpredicted by their component parts. HCMA's design demonstrates that city halls, museums and art galleries are not the sum and end of civic buildings for suburban communities like West Vancouver. By stacking aquatic, recreational, arts and mental/public health components around interior public spaces, a new kind of civic building type has been created here. It is a community centre, certainly, but it has also become West Vancouver's civic centre and now the most urbane location in town.

Photo: Nic Lehoux

The accomplishments of HCMA's West Vancouver Aquatic and Community Centre are subtle and incremental, the civic whole most definitely equaling more than the sum of its parts.

Trevor Boddy has two major projects debuting in January, 2010: *Vancouverism: Architecture Builds the City* (www.vancouverism.ca) and *TownShift: Suburb Into City* (www.townshift.ca).

Art Matters

Adriana Grant

It's in the Air, Tonight

With an installation, the very air is complicit in the act of art-making. A space, occupied, is filled with intention. And what could be more site-specific and time-based than a roomful of weather?

Sol Hashemi and Jason Hirata installed a fog machine as part of their exhibition *Please Stand By; Stand By Me* at Punch Gallery this past March. Graduates of the University of Washington Art Department's inaugural honors program in 2009, Hashemi and Hirata, both students of photography, have been collaborating since they met four years ago. This past summer, the pair was invited to use a shed belonging to Eric Fredericksen (Western Bridge) and Betsey Brock (Henry Art Gallery), where they hosted appointment-only art installations/performances in the unconventional space. Previously, the two collaborated in a studio shared with other UW photographers, and, in 2008, they mounted their first collaborative exhibit, *First Show*, sited in Storage Room, a converted storage room/gallery space in the basement of the UW Art Building.

"I was in a frat," Hashemi smiled, "and I did the lighting for parties, really as an excuse to buy lasers and fog machines and work with those. I was really drawn to these objects, these mediums for making parties or events happen." He described these tools as building blocks for visual culture.

"We would do whatever we do in the world," explained Hirata, "and use it in our art."

"It was a prepackaged product," Hashemi said of the fog machine that became an integral part of the Punch exhibit. "It's a commodity that has an actual experience," Hashemi continued, "as a product in this world." During the exhibition, the compact, metal-skinned, one-foot square, black box sat in the center of the gallery's unfinished cement floor. Its title: "Fog Machine To Be Activated at 9pm Tonight." This off-the-shelf commercial object was something you'd see at a club, a branded entity: the American DJ fog machine.

"It has two states," Hashemi explained, "During the day it acts as sort of a static thing. People would come in and they would be aware of the act that would happen a few hours later. They are standing in the space thinking of how it will look in the near future, as something they can come back to." In its passive state, the fog machine served as an object for the imagination, a trigger for memory as well as an occupier of the future. The dormant black box told its own story by bringing up the issue of time and by suggesting an alternate reality.

That imagined future, formed from one's experience with naturally occurring fog, wasn't quite what the returning visitor would experience. Generally, fog involves movement; either the fog itself drifts, or you travel through it. Perhaps you've driven through a misty patch on an evening excursion. Maybe you experienced a brief wash of whiteness, and then it dissipated; you came out the other side, and your view of the road was returned to you.

But in Punch Gallery, the fog-soaked air was contained and lit. At the appointed time, the artists created a manufactured experiment in perception. The fog machine filled the gallery with billowing clouds of glycol-infused molecules. "We turned all the lights on in the space," Hashemi explained. "It was completely white. It made the room feel brighter. You couldn't see around you, only four or five feet in any direction." The transition from switch-on to complete whiteout spanned a mere five minutes.

Like the artists, visitors experienced an open-eyed blindness. "We were interested in that optical quality of the space," Hirata said, "and wanted to work with that." During the monthlong exhibition, Hashemi and Hirata spent Thursday, Friday and Saturday nights at Punch (every day the gallery was open), outfitted against the cold in full-body down suits, arranging and rearranging light sculptures in the window. The artists performed at 9 PM, when the darkness outside enhanced their light play; they slept inside their installation, as well. Long tubes of neon and swirls of incandescent light played in the fog and off each other in that artificially-filled space. In a very literal sense, the atmosphere of the gallery was pushed out and replaced by a false material, a material that gave false impressions.

When the room was completely fog-filled, Hashemi and Hirata would turn off the machine, and the gallery would become a silent, rectangular cloud. Every so often, the artists would open the gallery door and allow their manufactured weather system to escape. "Fog would barrel out of the doorway," Hashemi explained. "It would be swept right out and go straight up."

In addition to its disorienting visual effects, the fog possessed a sound and a smell — the sound of the machine's pumping engine, accompanied by a chemical-laden scent — and it was not easy to breathe. The artists offered surgical masks to visitors and wore respirators themselves. (They say they've suffered no ill effects, though California regulates the Black Label brand "fog juice" as a potential carcinogen.)

Most notable was the fact that the machine-generated weather confounded the artists' ability to get their physical bearings—the fog scrambled their spatial orientation. "Because of that limited visibility, it opened up the space," Hirata said. "I would go around the gallery to get to something that was right next to me. It made the space feel really, really large." A roomful of manufactured weather and perception was turned on its head.

Adriana Grant is a freelance art writer. Her work has appeared in *The Seattle Post-Intelligencer*, *Seattle Weekly*, *City Arts*, *Public Art Review* and *art ltd.* magazine.

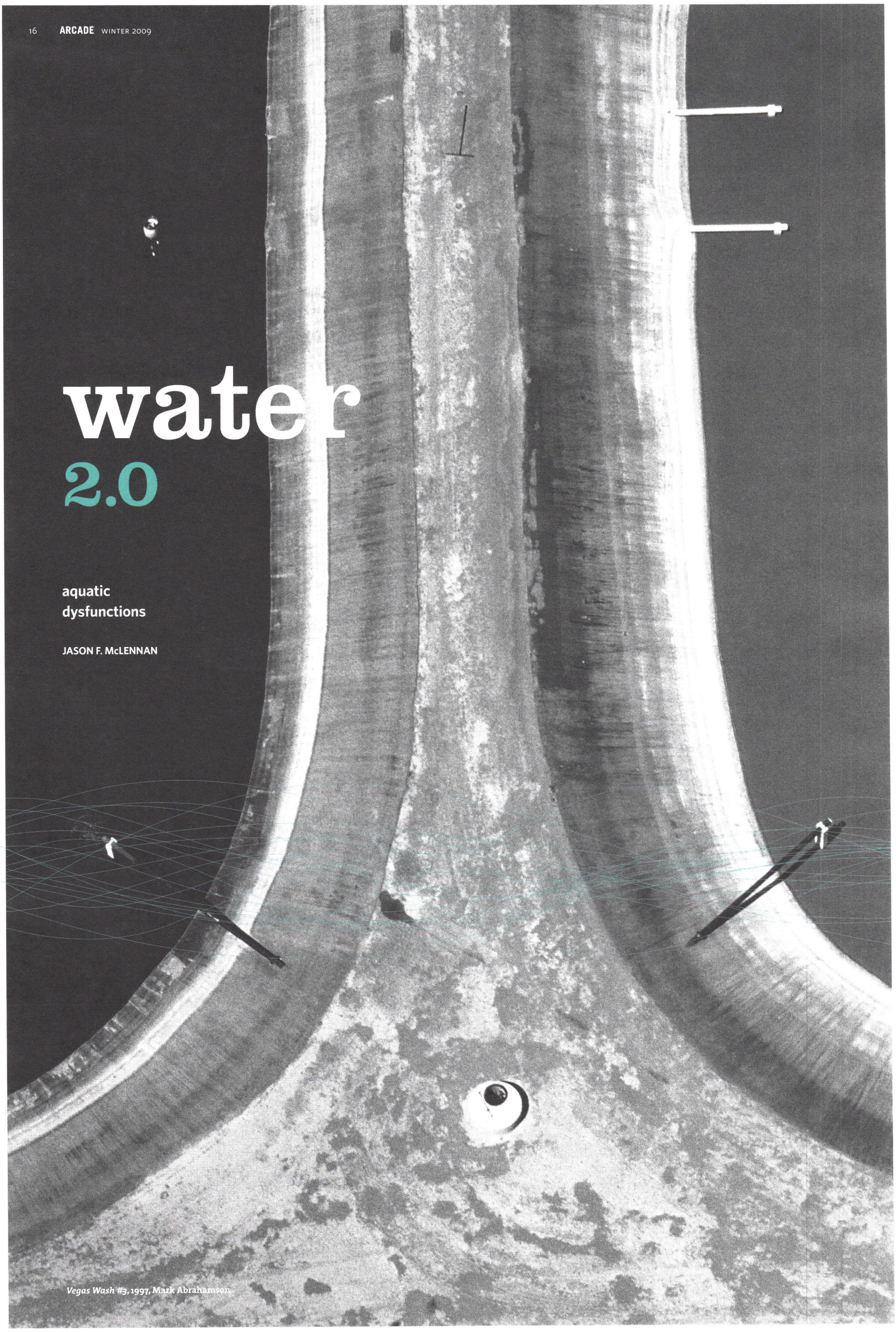
Jason Hirata and Sol Hashemi inside their Punch Gallery installation at night.

Photo by Claire Fox.

water 2.0

aquatic dysfunctions

JASON F. McLENNAN



Vegas Wash #3, 1997, Mark Abrahamson

"Water is the one substance from which the earth can conceal nothing:
it sucks out its innermost secrets and brings them to our very lips."

Jean Giraudoux, *The Madwoman of Chaillot*, 1945

PSYCHOPATH 1. Somebody affected with a personality disorder marked by aggressive, violent, antisocial thought and behavior and a lack of remorse or empathy, *Encarta World English Dictionary.*

I have always found that metaphors are one of the most useful tools in helping to convey complex ideas clearly and succinctly. Here's one you might find a bit shocking and abrasive, yet on close scrutiny is tragically accurate:

When it comes to our relationship with water, humanity's actions are so dysfunctional that it is safe to say that we have a psychopathic relationship with the resource.

True psychosis manifests itself in actions that are disconnected from reality, including delusional beliefs that can be violent, disturbing and self-destructive. And humanity often reserves its worst behaviors for those closest to it — the "flame burns hottest closest to the source," as they say — and the world is full of domestic disturbances and abuses to those that should by definition be the furthest from harm—our families, friends and the people in our communities.

Let's look at water. No natural resource could be closer to us; water is our family, it is us. Here is a substance that is not only critical to our very survival, but is in fact the whole basis for the existence of life on this planet. As David Suzuki says in the book *A Sacred Balance*, "We are water—the oceans flow through our veins, and our cells are inflated by water, our metabolic reactions mediated in aqueous solution."

In fact, as a species we are approximately 65% water—it defines and shapes us in every way imaginable, physically and spiritually, from our first few months in the womb, when we are literally enveloped by it, to life outside the womb, where we need to be constantly replenished with eight to ten cups of clean water each day to survive.

The world, being a finite, interconnected place, means that given time, we drink and breathe in water molecules that have been in every ocean, every river, every lake on the planet and inside of every animal, insect and person. We are all connected — truly — through the water on this great, blue rock.

Only a psychopath would seriously think it was okay then to take something so profound and so essential to our core being and to wantonly abuse it, degrade it and pollute it. Given that we depend so greatly on the *quality* of this resource — and given that it all literally comes back to become a part of us — you would think that our cultures would have created taboos, procedures and technologies that go out of their way to protect, nurture and improve its quality and conserve its use! Only a truly delusional and dysfunctional civilization would institutionalize practices and procedures that could pose a threat to its very own long-term survival.

A vast majority of our water is used in feeding us and in making the "things" we use in our daily lives—in other words, agriculture and industry. Both are leading causes of water pollution and water scarcity. The balance comes from daily consumption in our homes, offices and places of recreation. Americans use the most water per person of anyone on the planet—nearly 60 gallons/individual/day.

It's not a good record.

Every time we dump heavy metals, PCBs, industrial chemicals and fertilizers into water, we dump them into our own mouths and those of our children and grandchildren. Every time we wantonly use water, waste it, over-pump it and hurry it along through pipes and pumps rather than through natural flows and natural ecological cycles, we steal from future generations.

The very behavior that should be viewed as "crazy" is in fact codified in our regulations, building codes and water laws and worse still in our cultural taboos. We flush our toilets with clean, potable water when we shouldn't be defecating in our water supply to begin with. We irrigate lawns and fill our swimming pools in the American southwest—behaviors supported by price signals that make the resource so cheap that nobody even cares about it. We spend billions on moving water around in pipes —instead of taking care of and responsibly using the water we already have at hand.

When progressive individuals try to realign their relationships with water — through rainwater collection systems, composting toilets and greywater re-use, just to name a few — they are discouraged through regulatory barriers and financial obstacles.

We need some serious therapy!

The solutions to the water challenges we face exist today. It is possible to build living buildings (www.ilbi.org) and living communities that are completely water independent—even in the driest parts of the country.

Living Buildings use water super-efficiently; they capture all of their water needs through rainfall and snowmelt. Water is then reused multiple times and treated on-site without chemicals in a nearly closed-loop process. As more and more projects are proving, it is now possible to completely transform our relationship with water and waste from a psychopathic one to one which is balanced and well-adjusted.

The articles in this edition of *ARCADE* are meant to give just a glimpse towards a saner approach, with each author outlining one piece of an overall integrated approach to water use. It is clearly time to cure ourselves of our deep-rooted aquatic dysfunctions.

Jason F. McLennan is the CEO of the Cascadia Region Green Building Council. He is the creator of the Living Building Challenge, as well as the author of three books, including *The Philosophy of Sustainable Design*.

We are water you and I
We are upstream and downstream from each other
What you do to me, I do to you and so on and so forth
For my exhale is your inhale and my urine your next gulp

rainwater collection

a simple path to responsible water use

ANN & GORD BAIRD

Incorporating biomimicry into environmental design, whether commercial or residential, combines beauty, simplicity and function into responsible use. With that said, the natural world abounds with examples of simple rainwater harvesting. Lakes, ponds, wetlands and groundwater are excellent large-scale, natural examples of rainwater harvesting, while upturned leaves holding droplets serve as micro examples. Architectural expressions of natural systems for capturing and conveying the rain that falls on our sites can be inspiring and add significant meaning to any design. Storing rainwater for future use is a natural, life-supporting process that has been absent for much too long in modern building design.

However, times are changing, and we are increasingly cognizant of our abuses of the world's water. By installing rainwater harvesting systems, the water that is industrially treated is reduced, contributing to individual and community water security and maintaining balance in the natural water cycles of surrounding ecosystems. The impacts of rainwater collection — a simple process — can be profound.

Rainwater can easily be used for many purposes including irrigation, flushing toilets (which accounts for 30% of indoor water use), mechanical systems, cleaning needs and even potable drinking water, but conservation should always be considered first so that water requirements are reduced.

A Guide to Rainwater Harvesting

A basic system collects rainfall from the roof, filters out debris and then stores it in cisterns; storing clean water results in less tank maintenance down the road. The stored water can then be drawn upon and filtered further as required depending upon the use. It is critical to match the appropriate quality of water to its intended use.

Roof materials, gutters and slope all have their pros and cons. Metal, clay tiles and slate are great, but better yet, consider a living roof, which among many other benefits also acts as a mini-watershed for primary filtration. A living roof also has built-in drainage layers, thus reducing or eliminating the need for exterior gutters.

A first flush diverter is required to discard the first seasonal rain that falls on a non-living roof to clean-up the pollen, bird poo, needles and leaves. There is usually a secondary simple filter (screen) for leaves and other sedimentary materials.

Tanks are literally a big topic, and their size is determined by three factors: roof size, monthly/annual rainfall and monthly/seasonal usage. Cisterns can be concrete with a sealer or membrane, wooden, metal with a membrane, HDPE plastic tanks, ponds or wetlands. Ideally, as with any system, it is important to incorporate biomimicry and consider all the household systems when designing. For example, a large, concrete cistern can be incorporated in the foundation of a home, simultaneously adding a temperature moderating thermal mass, providing a possible dump for solar thermal heat and a water reservoir for fire protection. Your climate, site, budget, other systems and environmental leanings will guide your decision.

Stored water can be used for potable or other uses; non-potable usage does not require any further filtering before it is used but should be marked as "not potable."

Potable water needs to be filtered or sterilized to meet local code requirements. Usually rainwater will be filtered down to five microns before sterilization. Possible filters include sand, ceramic and disposable. Once adequately filtered, the water can be sterilized to kill any potential pathogenic bacteria via a UV sterilizer, a chemical sterilizer (such as bleach) or a membrane osmosis system; the choice depends on many factors, such as regulations and energy requirements.

What about code? Since policy can be lacking in many jurisdictions, common sense dictates having your water lab tested for potability. (For more on water regulation, please see Ben Gates's article "Taking the Guerilla Out of Greywater" later in this issue.)

If energy conservation is vital when processing rainwater (as it is at our home), use mother nature's pumps (gravity) wherever possible and then only special energy efficient pumps. Pump choice is based upon the desired pressure, the amount of head it has to travel (distance straight up) and the volume of flow.

Take for example our vegetable garden's drip irrigation system. We have a 2,500 square-foot living roof that collects 1,300 gallons for every inch of rainfall; 1" of rain on one square-foot of roof area produces 0.52 imperial gallons. Precipitation occurs during winter, so we store enough rainwater for four to six months of summer drought. Our storage capacity of 10,000 gallons consists of four tanks, all gravity fed to overflow to the next, thus eliminating our need for a separate stormwater system. Our domestic potable water comes from a deep well, and we utilize a no-flush toilet and low-flow fixtures to reduce our domestic water use. The rainwater system is designed for possible future upgrade to potable quality by installation of a sand filter between the living roof and the storage tanks and then through a five-micron ceramic-filter and UV sterilizer.

Larger scale examples consist of basically the same steps. Keeping systems simple and fully integrated into the building design is the key to water sustainability.

Nature can be our friend or our enemy. If we design with the natural environment, rainy, grey days are sources of joy and renewal, as we watch our vessels fill with the most precious of all resources: water.

For more information

www.eco-sense.ca
www.urbanraincatchersgazette.ca
www.waterbalance.ca
www.harvestingrainwater.com

Books to read

Rain Water Collection for the Mechanically Challenged, by Suzy Banks
Rain Water Harvesting for Drylands and Beyond, by Brad Lancaster

Ann and Gord Baird walk the talk of sustainable living in their newly completed (Dec 08), multi-generational, Eco-Sense home that is registered for the Living Building Challenge. The couple's passion and knowledge is expressed in their work consulting, building and advancing policy, and in the hundreds of tours they have given of their home. They teach that if it isn't affordable, it isn't sustainable and live their motto, "Less life stuff...more life style!"

FROM TOP LEFT:

Moss covered rock: Stores water in a biological sponge for the eco-system living on the rock.

Bird bath in the garden: Surrounded by tomatoes and grapes, the thirsty Crossbills enjoy a drink of rain water.

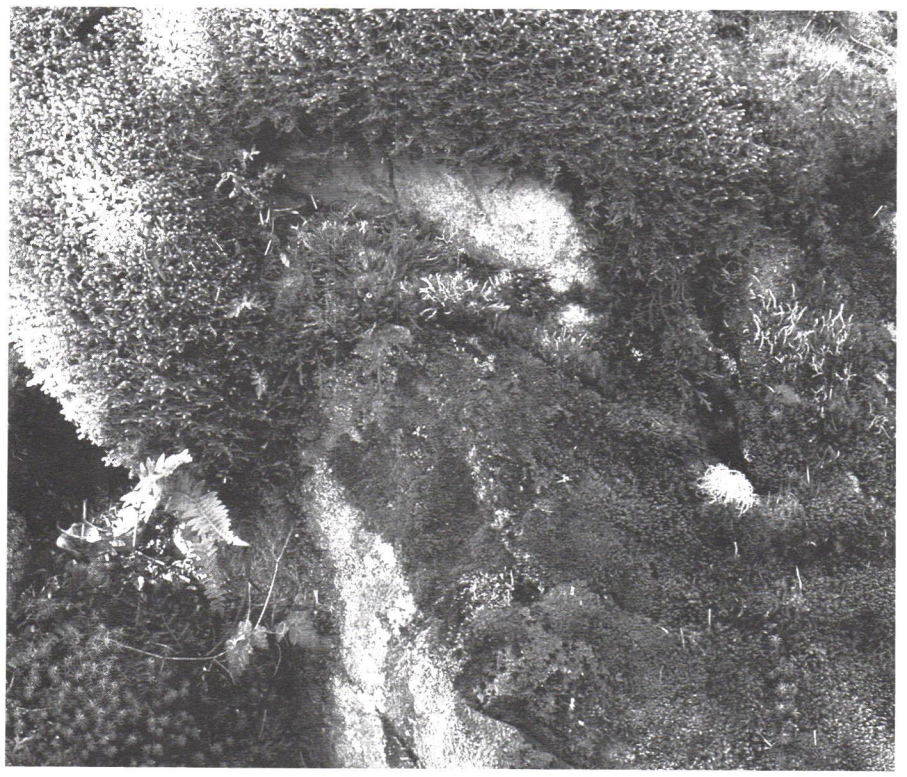
Living roof on cob wood working shop: Planted with native species this low intensity living roof acts as a mini-watershed for rain water filtration.

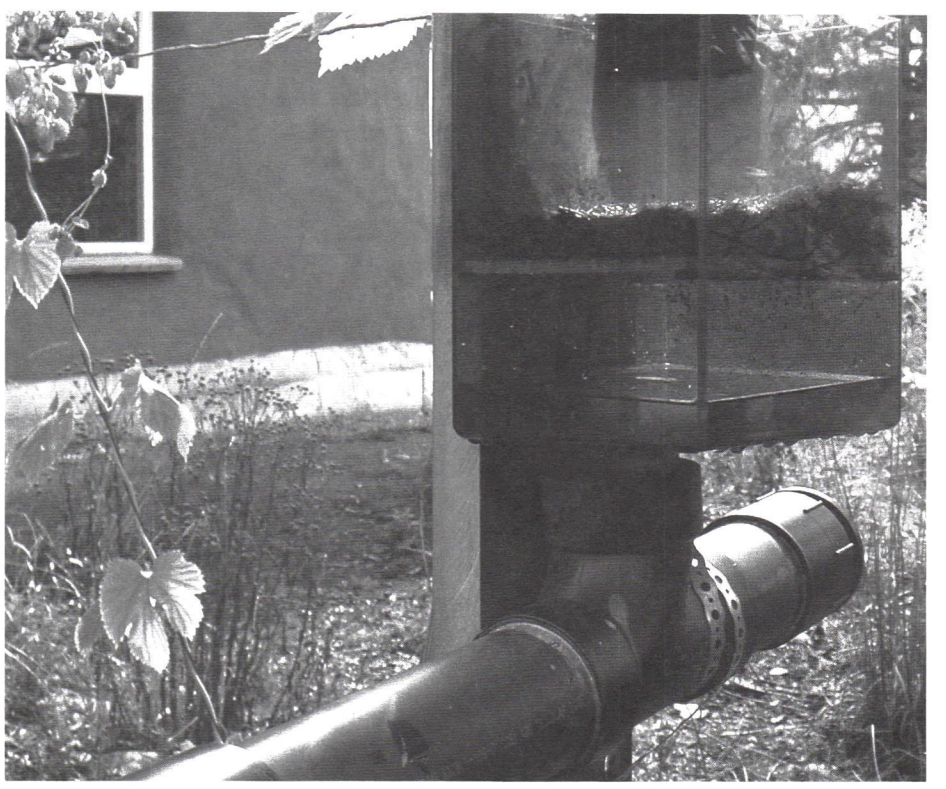
Rain water filter: Easy to clean device for filtering needles, leaves and sediments.

Cabbage leaves: Upturned leaves collect rain water for birds and other creatures present in an organic garden.

Water Tank: Boo the dog is dwarfed by a 3300 Gal HDPE rain water storage tank.

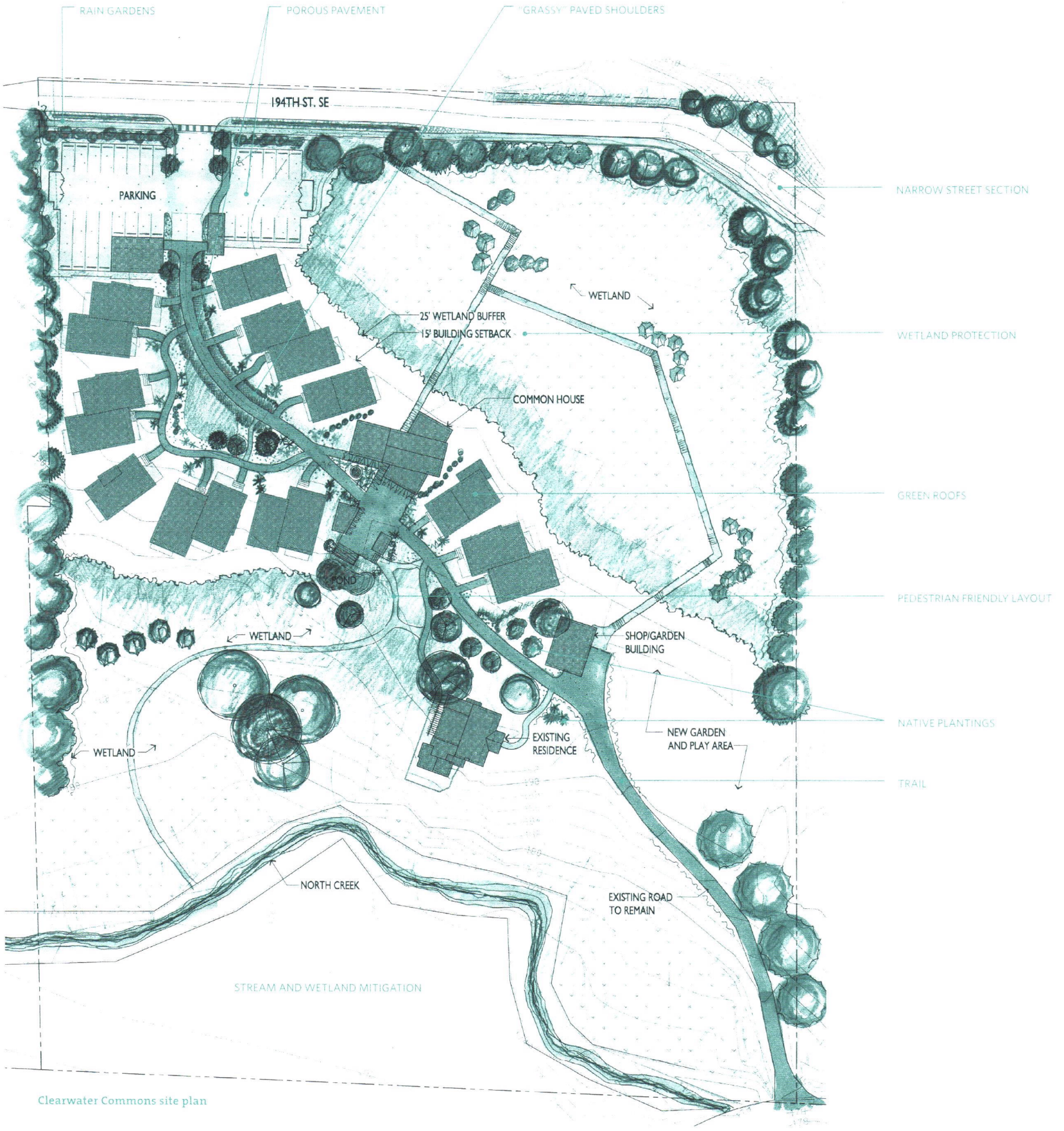
Solar Cob home surrounded by food gardens irrigated with rain water/





**Thousands have lived without love,
not one without water.**

— W.H. Auden, *First Things First*, 1957



Clearwater Commons site plan

net zero impervious design

a radical concept

MARK BUEHRER

Stormwater is rainwater and melted snow that runs off streets, lawns, farms and construction and industrial sites. Under natural conditions, stormwater is absorbed into the ground, where it's filtered and ultimately replenishes aquifers or slowly flows through forests and meadows and into streams and rivers. In developed areas, however, impervious surfaces, such as paved streets, parking lots and building rooftops prevent precipitation from naturally soaking into the ground. Instead, the water runs rapidly into storm drains, sewer systems and drainage ditches, and the resulting rush of stormwater discharge can cause downstream flooding and erode stream banks. As the ensuing runoff flows over the land or impervious surfaces, it accumulates debris, chemicals, sediment, bacteria or other pollutants that adversely affect water quality and contaminate watersheds and coastal waters.

> Of all our natural resources, water has become the most precious... In an age when man has forgotten his origins and is blind even to his most essential needs for survival, water along with other resources has become the victim of his indifference.
>
> — Rachel Carson, *Silent Spring*, 1962

In the 1970s, it was recognized that our country's water and accompanying infrastructure was in a state of crisis, mostly due to uncontrolled wastewater and stormwater discharges into surface-water bodies. The EPA's Clean Water Act was initiated, and engineers were called to help solve the problems. Solutions were applied to the point in the systems where the problems were most apparent or concentrated, such as at the "end-of-the-pipe"; the concentrated flows and pollution-carrying runoff of the piped conveyance systems were dumping excessive volumes of polluted stormwater into streams and lakes, causing erosion and loss of habitat, so this is where primary attention was given. Designing for crisis-management (instead of prevention), the "standard" solution of "detention ponds" was used to help reduce the impacts of concentrated stormwater flows even though these were often unsightly.

But it has now been recognized for well over a decade that end-of-the-pipe solutions are not enough to protect our most precious resource. In February 2009, the Washington State Pollution Control Hearings Board "affirmed its landmark August 2008 ruling that the largest Puget Sound cities and counties had to take significantly more aggressive steps to reduce stormwater runoff, including mandatory use of 'low impact development' techniques. The Board affirmed its previous ruling that the permit's focus on traditional engineered stormwater management facilities, like detention ponds, was inadequate to protect Puget Sound and meet the law's requirements and that greater use of low-impact development techniques — reduced impervious areas, greater protection of native vegetation and onsite stormwater management — would be necessary."

This ruling confirms the idea that it is time to look at ways to eliminate the "root problems or root causes" of the situation. In summary, the primary challenge is to make a radical shift from the current paradigm of impervious surfaces and piped water conveyance to urban environments to pervious surfaces and natural surface flow.

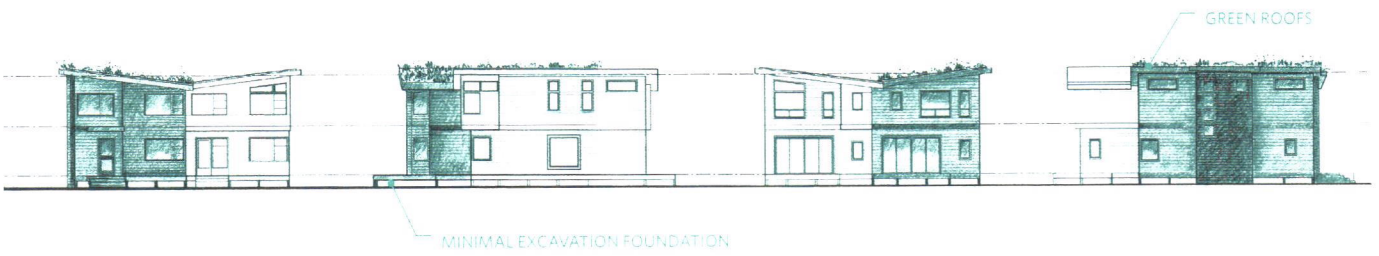
One innovative approach, Net Zero Impervious Surface Design, is a method for developing, or re-developing, land in a manner that strives to create a built condition that mimics nature through the use of features that maintain or restore a site's natural hydrologic conditions, achieving an effective "net zero" amount of impervious surfaces. The earth, just like all forms of life, needs to be able to "breathe" and take in water in order to maintain or restore its health.

Current stormwater management can be summarized in two main areas: water quality and water quantity (flow control). The latter is typically focused on designing for the "100-year" storm event. A Net Zero Impervious Surface Design approach focuses more on the 99.9 percent of the other rainfall events, while still providing adequate provisions for handling the occasional occurrences of very-high precipitation periods.

The design strategies that can be used to meet the goals of a Net Zero Impervious Surface Design can include a combination of LID techniques, such as:

- Preservation and restoration of native vegetation
- Geometrics & layout (build less—i.e. narrow streets)
- Pervious pavements (permeable surfaces)
- Bioretention (raingardens)
- Soil amendments (compost-amended soils)
- Rainwater harvesting (collection and reuse)
- Low impact foundations (little or no excavation)
- Green roofs

In addition to LID techniques, the Net Zero Impervious Surface Design approach also considers other sustainable building principals such as material choices (i.e. toxicity and life-cycle issues) and general compatibility to the site's original natural conditions.



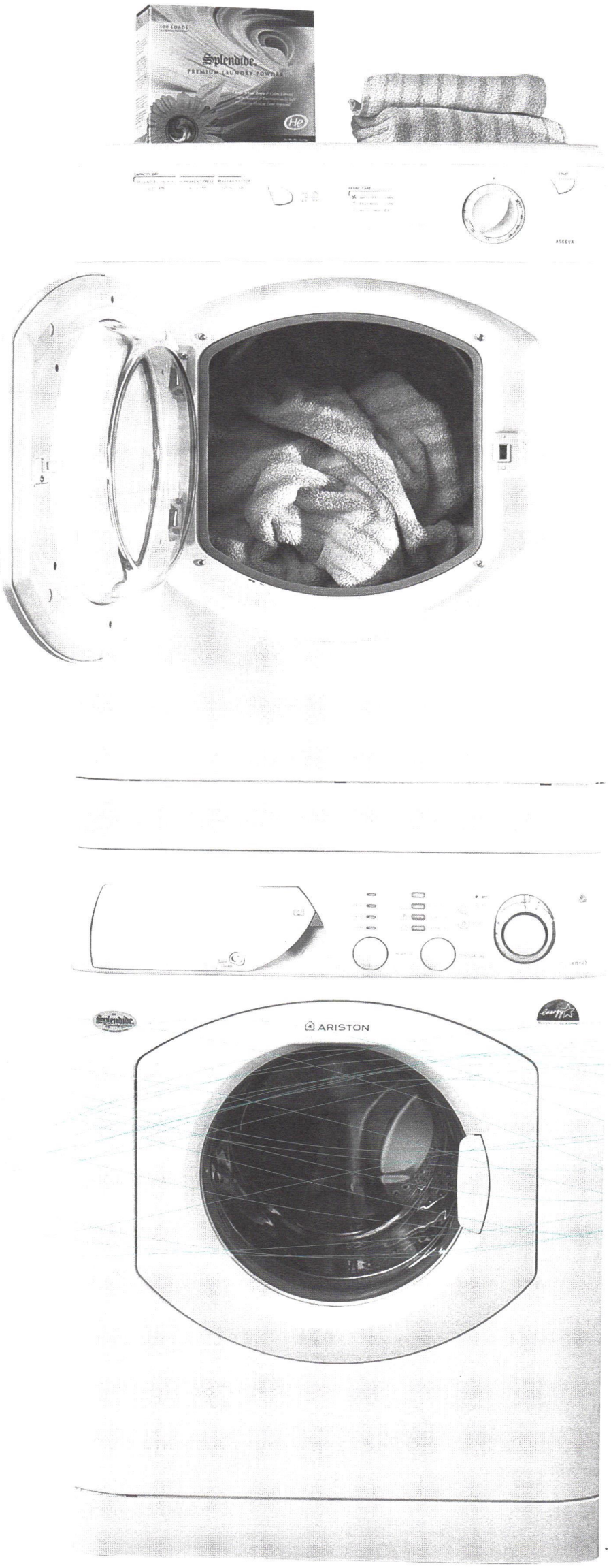
About a decade ago, an alternative approach for the management of stormwater was conceived and developed. This concept was named Low Impact Development (LID). LID is a comprehensive land-planning and engineering design approach that aims to maintain and enhance the pre-development hydrologic regime of urban and developing watersheds. It combines resource conservation and a hydrologically functional site-design to reduce development impacts to better replicate natural watershed hydrology and water quality. Through a variety of small-scale site design techniques and impervious surface reduction strategies, LID controls runoff discharge, volume, frequency and the ability to mimic natural, pre-development conditions. The unique LID micro-management source-control concept is quite different from conventional end-of-the-pipe treatment and detention methods typically used for stormwater control.

LID concepts have provided many good ideas for providing alternative methods for stormwater management. Taking the proven concepts of LID and combining them with other sustainable "green" building practices leads to other opportunities that are simple, environmentally friendly and cost-effective.

One example of a Net Zero Impervious Surface Design is a co-housing project named Clearwater Commons, located near Bothell in Snohomish County, Washington. All pavements are pervious—either pervious concrete or permeable pavers. The project actually has *more than 100%* of its surfaces meeting the net zero goal. This was possible because the homes are elevated on pin-pile type foundations to allow stormwater to pass under them, and some of them have green roofs that provide a "double" count of pervious surfaces when measuring the amount of projected surface areas that meet the net zero impervious criteria.

As more projects have now been built with these types of stormwater management strategies, it's becoming easier to show not only their benefits to the environment, but also, in many cases, a significantly lower cost for building a superior type of stormwater system. This is an example of the win-win scenario that true sustainability seeks to provide—one that helps both our economy and our environment.

Mark Buehrer, P.E., is the founder and director of 2020 ENGINEERING located in Bellingham, Washington. Author, inventor and civil engineer for over 27 years, Mark coined the Net Zero Impervious Surface Design approach.



stop

value-added products and practices to support water efficiency

EDEN BRUKMAN

Turn a faucet handle and water flows freely from the tap. We are so accustomed to the seemingly limitless supply of potable water that any other result from this action seems inconceivable. Yet, for the last couple of years, the Pacific Northwest has experienced abnormally dry and/or drought conditions throughout all four seasons. Conventional practices are incredibly wasteful and exacerbate the disconnect between perceived water supply and reality, both by design and use: It is unlikely for water to be repurposed, and sometimes water leaves a building before it is even used once. For example, consider the water that is discharged while brushing one's teeth. Just by turning off the sink faucet during this activity, a person could save about 1,300 gallons of water a year from going to the sewer. This may seem inconsequential at a glace, but when applied to the US population, this change could represent approximately 400 billion gallons in saved water. Yes, behavioral modifications are necessary for water conservation. And help is out there—plenty of efficient fixtures on the market today can considerably decrease water demand.

The American Water Works Association claims, "Daily indoor per capita water use in the typical single family home is 69.3 gallons. ...By installing more efficient water fixtures and regularly checking for leaks, households can reduce daily per capita water use by about 35% to about 45.2 gallons per day."

Let's start in the bathroom. Almost every major toilet manufacturer offers an option that uses less than the 1992 EPA Energy Policy Act limit of 1.6 gallons per flush (gpf). Some have a single reduced rate of 1.28 gpf. Dual flush toilets are an alternative that further decreases water use. These allow an individual to push one of two buttons, usually located at the top of the tank, to dictate the amount of water released, which can be as low as 0.8 gpf. To compare these and other details that determine how well popular toilet models function, the California Urban Water Conservation Council created the Maximum Performance (MaP) testing protocol, now in its 14th edition.

There are also urinals that reduce water demand, using a pint, instead of a gallon, of water per flush. However, water efficiency should start by asking if it is even needed; composting toilets and waterless urinals offer solutions that have no water demand and have other tangible benefits. In sourcing a waterless urinal, one should also take into account the other components of the fixture, such as whether it includes a cartridge—a piece that gets replaced regularly and is deemed to be "toxic waste" when disposed.

Comfort doesn't have to be compromised to save water. Low-flow showerheads tend to augment water with air to maintain decent water pressure. The 1992 EPA Energy Policy Act set the threshold at 2.5 gallons per minute (gpm), but manufacturers offer lower rates, even 1.5 gpm—a 40 % reduction. WaterSense, a third-party tested program sponsored by the EPA, labels efficient showerheads and other water-saving devices and has an online directory to assist consumers. In addition, WaterSense intends to create performance specifications that increase stringency for a variety of fixtures over time.

wasteful spending

We forget that the water cycle and the life cycle are one.

— Jacques Yves Cousteau

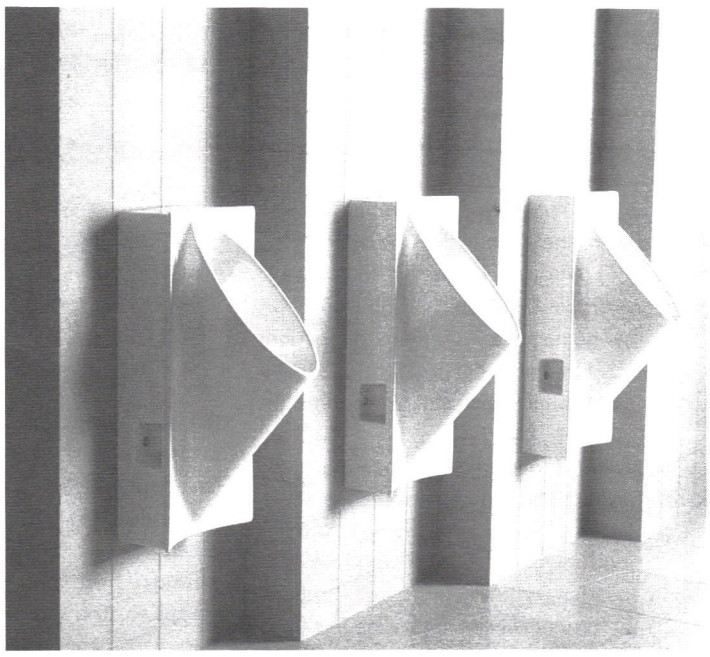
There are easy ways to improve upon faucets that meet the current flow maximum of 2.5 gpm, too: Retrofit aerators for kitchen and bathroom faucets are available at most hardware stores, and many faucets are sold new with options for aerator efficiency upgrades. For bathroom fixtures, aerators may reduce flow rates to as little as 0.35 gpm, but 0.5 gpm versions are more readily available. Kitchen faucets have adjustable attachments that reduce flow to 1.5 gpm.

A dishwasher is another appliance in which water use can be optimized. Though there are compact "dish drawers" and narrow models that have obvious explanations for using less water, even standard-size dishwashers can be efficient. Dishwashers must use less than 5.8 gallons per cycle to wear the Energy Star label; despite its name, Energy Star restricts not only electricity, but also water demand. According to Energy Star, scraping dishes clean rather than rinsing them prior to loading the dishwasher can save an additional 20 gallons of water per load, another example of how small actions can advance water conservation.

Energy Star also recognizes clothes washers that can save 40% of the typical demand of 35-45 gallons of water per load. In fact, some of the newer models include technology that measures the size of the load of laundry and determines how much water is needed to clean it. However, this may result in more water per load for some washers, with a reported range of 15-30 gallons, only slightly less than conventional counterparts.

The rise of participation in green building certification programs has certainly increased the installation of more ecologically minded options — particularly in new construction — but the built environment is still predominantly populated with improvident fixtures. In a way, industry is ahead of the curve when it comes to introducing water efficiency into our homes and offices; these are but a handful of considerations. It is now up to us as a society to implement — or merely install — the solutions.

Eden Brukman is the Research Director for the Cascadia Region Green Building Council and the Vice President of the International Living Building Institute. A licensed architect, she has focused her professional career on incorporating socially and environmentally responsible strategies into design and construction, particularly related to building certification and the specification of appropriate materials.



OPPOSITE PAGE:
This stackable clothes washer, the Ariston AW125 by Splendide, uses between 7.5 and 16 gallons of water per load.

THIS PAGE FROM TOP:
Kohler's Steward waterless urinal is cartridge-free. Waterless urinals can save 40,000 gallons of water per fixture per year, based on a typical commercial installation.

An instant grey water reuse mechanism, Caroma's Profile Smart 305 is a dual flush toilet (0.8/1.28 gpf) with an integrated sink.

hey man, don't piss in my drinking water!

PETE MUÑOZ

The American Society of Civil Engineers (ASCE) 2009 Report Card for America's Infrastructure assessed the condition and capacity of our nation's public works with an overall grade of D. ASCE estimates that $2.2 trillion is needed over the next five years to bring the nation's infrastructure to a good condition. While the establishment of a long-term community development, maintenance and replacement plan must become a national priority, there is no time like the present for thoughtful, creative, transformational work.

Unfortunately, our reconstruction efforts are focused on replacing the same old infrastructure that has been failing for years. And at this opportune time, too much of the stimulus dollars are funding "shovel ready" projects (i.e. projects that were shelved because the community didn't want them in the first place). Now is the time we should be thinking about why we love the communities in which we live, what we want our communities to look like and how we want them to function. We have a tremendous opportunity to create infrastructure that helps improve quality of life, reconnects community and even regenerates life.

And well, for starters, there is no better place to look than our own shit. Literally. We are pooping in our drinking water...or someone else's downstream. And our current infrastructure isn't helping. We combine all our wastewater (black, grey or otherwise) in huge, leaky pipes that funnel all of our waste to some location (typically in a disadvantaged neighborhood), where we attempt to treat everything before flushing it down the river to the next city. These are usually the same piping networks that convey stormwater, too, so every time it rains we overflow raw sewage into our rivers and oceans. The next city pulls water out of the river and treats it again for their drinking-water supply as well as all other water needs: irrigation, industrial uses, washing cars, etc.

We need smarter infrastructure (and smarter engineers). We need infrastructure that can help supply and treat different types of water for different types of uses. One of the simplest infrastructure methods is called "source separation." This basic strategy tackles the problem before we've created it by combining everything into one big pipe. One of the easiest separations is between toilet waste (blackwater) and all other domestically generated wastewater (greywater). Greywater, under most regulations, is defined as water generated from bathroom sinks, showers and usually kitchen sinks (with no garbage disposals) and laundry sources (without diaper washing). Seems simple enough... however, all of our existing homes and buildings are constructed with combined plumbing, and regulations are slow to change.

But real change is happening, especially for renovations and new construction. Whole municipalities are beginning to change plumbing codes to allow duel wastewater plumbing options; some are even requiring greywater "stub outs." Tucson, Arizona will require that all homes are issued permits after June 1, 2010 to have infrastructure that conveys blackwater and greywater separately. Even if the owner does not have a greywater treatment system, the infrastructure will be in place for when technology, climate or market forces push people to consider more sustainable water management. Santa Fe County, New Mexico has a "permit" by rule, which allows anyone to have a greywater system under 250 gallons of water a day without any cumbersome paperwork.

Greywater, while void of most of the bacteria and nutrients typically found in conventional wastewater, still needs to be treated with care. Greywater breaks down very fast and if left stagnant (in a tank) for more than 24 hours, can create odor issues and start to grow filamentous bacteria that can be detrimental to any water reuse system. When greywater is kept aerobic, it can become a great non-potable water resource. Treated greywater is frequently reused for irrigation, toilet flushing and/or used in building cooling towers.

We need smarter infrastructure (and smarter engineers). We need infrastructure that can help supply and treat different types of water for different types of uses.

Arizona State University (ASU) is a pioneer in greywater reuse. ASU's new honor college dormitory collects and treats all of the greywater generated from approximately 2,000 students. All the water is cleaned and kept aerobic by running through a small sand filter before being used to irrigate the campus landscape. This saves the university from using approximately 10,000 gallons of drinkable water per day. That is no drop in the bucket.

Tempe, Arizona's downtown Transit Center collects all of its greywater, treats it onsite and reuses it to flush the toilets. This sort of infrastructure not only saves the re-user money from purchasing water—it lessens the load (and potential overload) on the municipal wastewater infrastructure. Often overlooked but equally important, it lessens the energy used to treat the water otherwise used, convey the water from the municipal source and move wastewater on to a central wastewater plant.

Greywater systems can be simple or complex and may be utilized at almost any scale (home or city-wide). In my own home, water from our washing machine is simply diverted to a treed mulch basin; the trees are about 50% larger than the ones planted a couple feet away (not on the greywater system).

If we are to move to the next level of sustainability, our homes and communities must not battle the infrastructure that supports them. Whether our water infrastructure consists of closed-loop, recycled systems or is integrated into the landscape to complete synergic benefits, the potential to create healthier communities is right in front of us... yer, right below us. So the next time you are sitting on the throne, ask yourself: Where does all your water come from and where is it going?

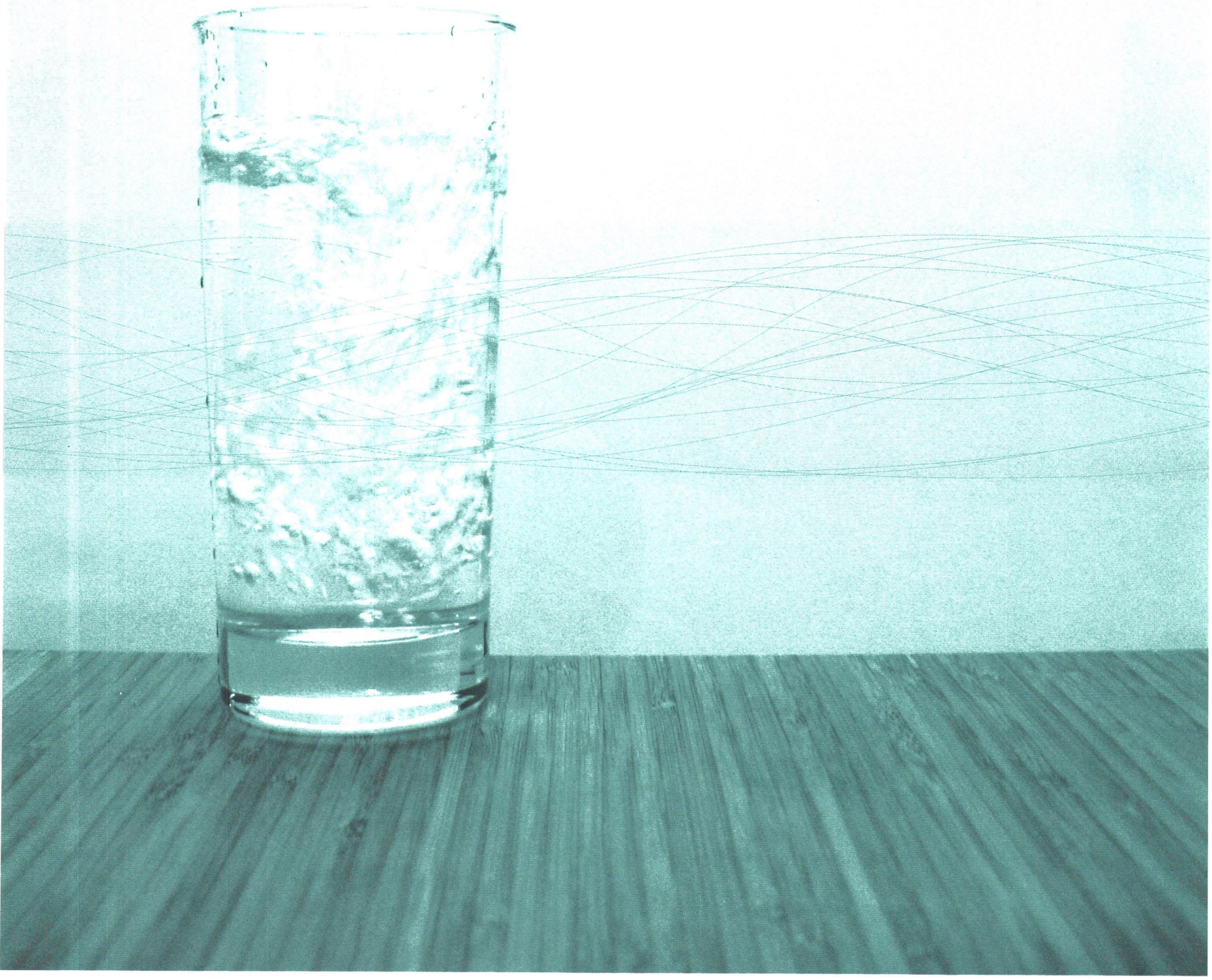
For creative ideas, try these resources:
www.greywater.org
www.greywaterguerrillas.com
www.greywateralliance.org

For ASCE's assessment of our infrastructure, visit:
www.asce.org/reportcard/2009

Pete Muñoz, PE, LEED AP is Senior Engineer at Natural System International (NSI), a leader in green water infrastructure. Pete and NSI work the planet trying reconnect communities with their infrastructure. Pete teaches several water infrastructure courses at Yestermorrow Design/Build in Warren, Vermont. When not seeking-out water with his daughter Hazel in Santa Fe, New Mexico, they daydream about the Great Lakes of Michigan.

Though we appear to be solid, we are really liquid bodies, similar in a way to gelatin, which also seems solid but is in fact largely water, made consistent by the presence of organic colloids.

— Daniel Hillel, *Environmental Soil Physics*, 1980



MORGAN BROWN

Wastewater treatment in the developed world is managed in a spectacularly wasteful and unsustainable manner. At fabulous cost, precious potable water is transported to our buildings where much of it is used to convey our excreta through an even more expensive system of centralized pipes and sewer plants. The fiscal and environmental costs of this centralized paradigm have become untenable.

Using biomimicry, sustainable design can close the loop by decentralizing the harvest, use, treatment and reuse of water resources. Green building programs like USGBC's LEED rating system recognize this by encouraging projects to treat and reuse their wastewater; at the forefront of green, the Living Building Challenge mandates it. Treating blackwater — water mixed with human urine and feces — to reuse standards has been considered among the most challenging and expensive tasks for green developments. It doesn't need to be. Decentralized and distributed biological solutions offer attractive, cost-effective blackwater treatment options.

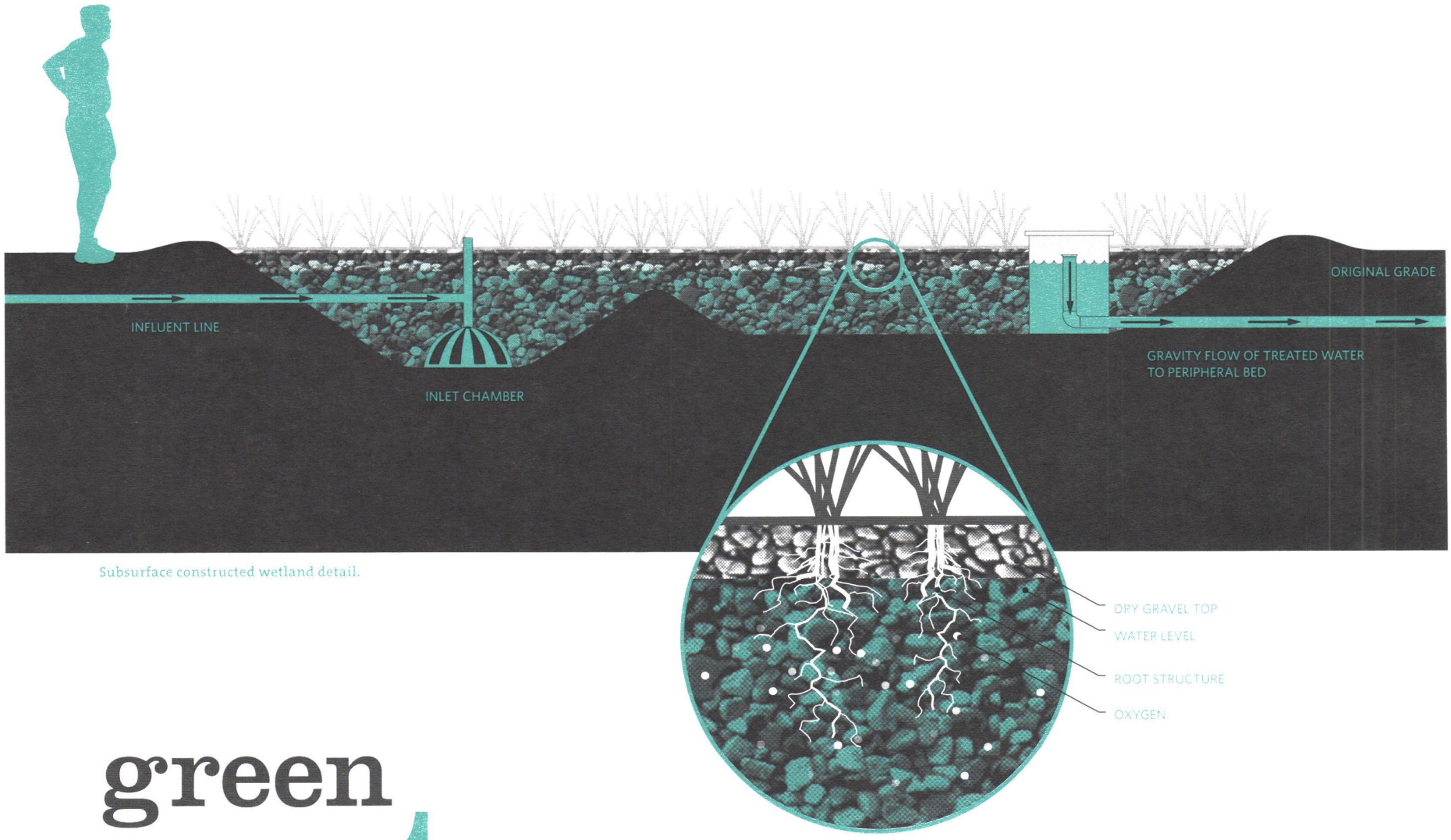
Package Plants — Membrane and Vertical-shaft Bioreactors

Often, the first "decentralized" wastewater proposal is to transport the centralized technology to the development site by installing a package treatment plant. Membrane bioreactor (MBR) plants represent the latest in sewer technology and are often considered for large green projects because they can treat blackwater to reuse standards. The challenges with MBRs lie in their expense, energy use and maintenance costs. Vertical-shaft bioreactor (VBR) plants address these challenges by taking the same biological process underground in a sealed chamber up to a 100m deep. Advantages over surface plants include decreased land use (10-30%), lower energy consumption (<50%) and reduced maintenance. Small footprints and contained odors make VBRs good neighbors and reduce NIMBY-ism (Not In My Back Yard). More common in Asia and Europe where energy and land costs are high, VBR plants are located in basements of hotels throughout Japan.

Distributed Treatment — Constructed Wetlands, Sand Filters & Composting Toilets

Package plants are familiar technology, but distributed treatment systems located closer to the point of use and utilizing biology mimicking natural processes often provide greater economic and environmental benefits. At the apex of biomimicry, constructed wetlands treat blackwater to reuse standards by replicating and concentrating how natural wetlands purify water. While the basics of subsurface constructed wetlands are simple (a basin filled with gravel, pipe in, pipe out, plants), the biological processes are complex. During treatment, water passes through thousands of microzones containing a rich variety of aerobic and anaerobic bacteria. Science is just beginning to discover why wetlands remove impurities as well as they do—including pollutants like pharmaceuticals that remain elusive for conventional engineering. With good design, constructed wetlands use little or no energy, are extremely robust and require virtually no maintenance. Subsurface wetlands range in scale from single family home to large building or campus solutions, providing project designers with a variety of new options. Since they can be landscape amenities, finding space is virtually always possible with creative design. If urine separation is incorporated, the constructed wetland's size can be reduced by half.

Over the years, a variety of features have been tried with constructed wetland design, including recirculation, tidal cycles, tropical plants and greenhouse enclosures. While appropriate for specific applications, these options often aren't necessary, and basic biomimicry can result in lower cost, higher reliability, better aesthetics, lower energy consumption and less maintenance.



Subsurface constructed wetland detail.

green water

sustainable, decentralized blackwater treatment

The sewer is the conscience of the city.

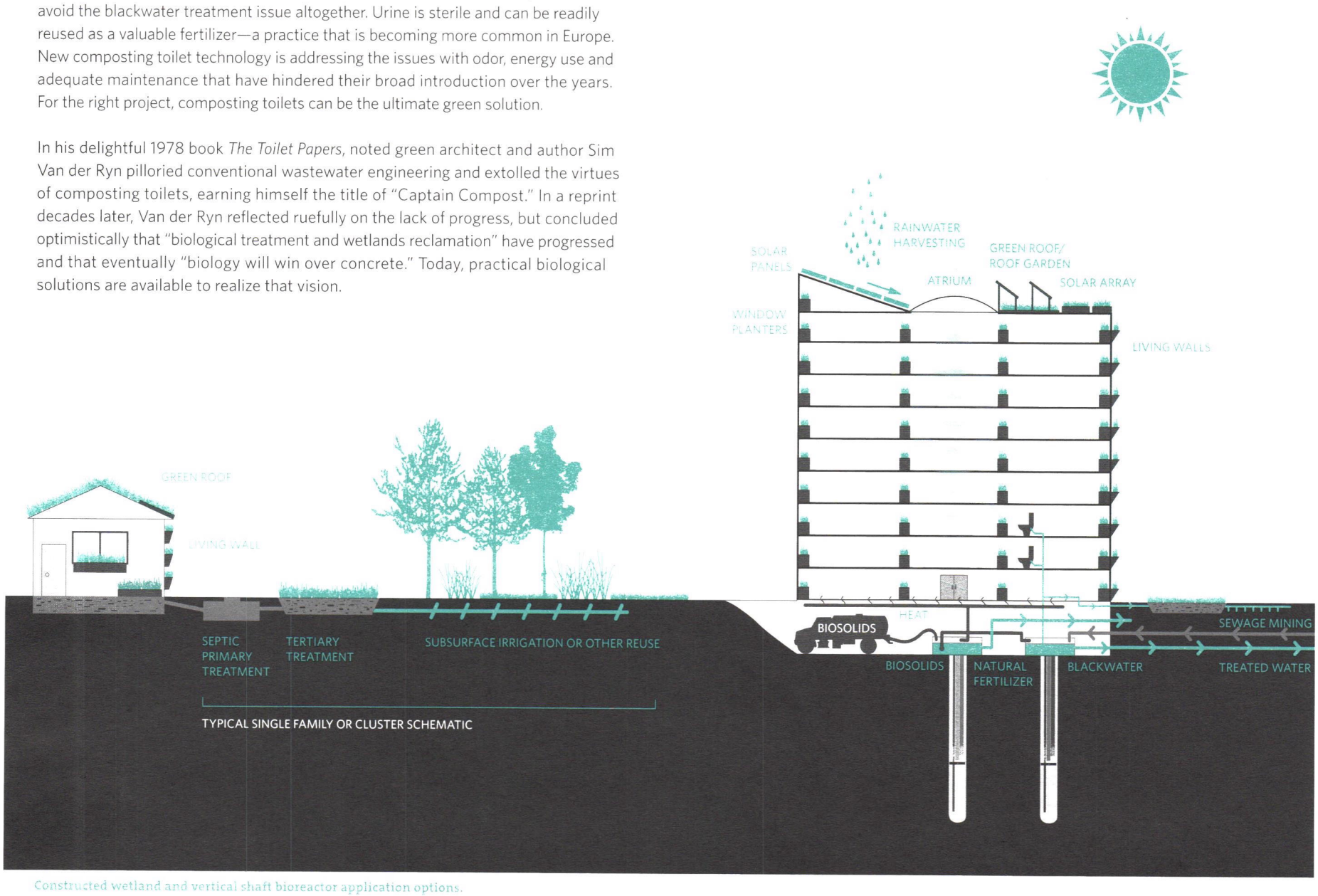
— Victor Hugo, *Les Miserables*, 1862

Advanced filter-bed bioreactors represent another distributed treatment option with many of the benefits of constructed wetlands. High-performance treatment is achieved by recirculation through enclosed tanks with an anaerobic chamber followed by an aerobic filter bed. Compact, sealed and without plants, space and moisture loss are minimized, making these systems a good option for applications where footprint and maximum water recovery are the top priorities.

Composting toilet systems, combined with urine separation, have the potential to avoid the blackwater treatment issue altogether. Urine is sterile and can be readily reused as a valuable fertilizer—a practice that is becoming more common in Europe. New composting toilet technology is addressing the issues with odor, energy use and adequate maintenance that have hindered their broad introduction over the years. For the right project, composting toilets can be the ultimate green solution.

In his delightful 1978 book *The Toilet Papers*, noted green architect and author Sim Van der Ryn pilloried conventional wastewater engineering and extolled the virtues of composting toilets, earning himself the title of "Captain Compost." In a reprint decades later, Van der Ryn reflected ruefully on the lack of progress, but concluded optimistically that "biological treatment and wetlands reclamation" have progressed and that eventually "biology will win over concrete." Today, practical biological solutions are available to realize that vision.

Morgan Brown, LEEP AP is president of Whole Water Systems. After graduating with a degree in electrical engineering, Morgan pursued a successful high-tech career in Europe, Seattle and Silicon Valley. Following his passion for the environment, together with decentralized water treatment pioneers biologist John Grove and engineers Patrick Fitzgerald and David Venhuizen, Morgan founded Whole Water Systems to address sustainable water design for green development projects. www.wholewater.com.



Constructed wetland and vertical shaft bioreactor application options.

taking the guerilla out of greywater

BEN GATES

Want to do the right thing to conserve water and reduce waste? Most Americans have few options beyond using efficient fixtures and taking shorter showers—unless they want to break the law. We know how to harvest rainwater for drinking, reuse greywater for clothes washing, treat blackwater for toilet flushing and compost night soil. However, regulatory change must occur before the public can install these systems to harvest and reuse water in these ways.

In most states, it is illegal to use wastewater for many beneficial uses. Why? Over a century ago, laws were instituted to protect public health by diverting "sewage" to lakes and rivers. With later industrialization and urban growth, the capacity of nearby watersheds to absorb waste was exceeded. For example, in the mid-1930s, juvenile salmon released into Portland's Willamette River were dead within 15 minutes due to toxic sewage. For the city's residents, swimming in the Willamette was swiftly banned.

Following such discoveries in the mid-50s and 60s, Northwest cities such as Portland and Seattle built wastewater treatment facilities. Over the next few decades, congressional mandates led to further improvement in water quality and wastewater treatment. In 1972, national treatment standards were enforced under the Clean Water Act, and in 1974, the Safe Drinking Water Act mandated drinking-water standards for all public water systems.

Today, the responsibility for regulating the nation's drinking water and waste occurs across local, state, regional and federal levels. Federal agencies, state agencies and local municipalities administer laws which are often inflexible in light of today's water treatment and reuse opportunities. As a result, doing the right thing is hard and downright complicated.

In planning for a new building, Central City Concern, a Portland-based non-profit organization, explored how an urban high-rise might use only the water resources on site and discharge no sewage. Rainwater could be consumed; greywater (and even blackwater) could be harvested and treated for beneficial uses. However, almost every harvest and reuse strategy proposed was met with a regulatory hurdle. Together with their expert team of architects and engineers (known as the "Water Team"), they began to knock on the doors of regulatory agencies.

The Water Team convened a charrette inviting regulatory officials and other interested parties to help clarify the hurdles. The resulting roadmap helped identify a comprehensive set of water harvesting and reuse options linked to the agency responsible for oversight. With the roadmap in hand, the Water Team instigated and participated in two regulatory change efforts—new statewide provisions in Oregon's plumbing code for rainwater and greywater use and a new state law to legalize greywater.

These statewide changes illustrate an important distinction for designers of water and waste systems. Water that falls on or flows through a building is regulated by state building codes. Outside of buildings, water and waste is regulated by state departments of environmental quality. However, water and waste strategies inside and outside of buildings often interface with state departments of health and other local, regional and federal agencies.

Oregon's recent state code revisions address water inside of buildings. Treated rainwater is now approved for potable uses and can be used in toilets, washing machines, irrigation and hose bibs in private homes and commercial buildings. Treated wastewater from bathtubs, showers, lavatories and washing machines (greywater) is approved for non-potable use.

Oregon's recently adopted Greywater Bill (officially knows as Hose Bill 2080) addresses water reuse opportunities outside of buildings but also provides liberal wastewater definitions that will give agencies flexibility to interpret and administer existing regulations. The groundbreaking aspect of this bill was to distinguish greywater and blackwater from sewage. In addition, the bill instructed the Department of Environmental Quality to provide a permit that will allow greywater to be used for beneficial uses. Within a year, irrigating backyard plants with greywater may no longer be illegal, and other uses of greywater will be allowed without applying for the Water Pollution Control Facility permit required by sewage treatment plants.

Seeking statewide change represents a new opportunity for designers, advocates and regulatory officials to dramatically impact our ability to realize sustainable buildings. Until now, architects and engineers have challenged barriers by applying for a building code exception to utilize systems like rainwater harvesting that are not approved by their state building codes. These one-off allowances have been occasionally granted and if built are important precedents to show what is possible. However, a decline in water availability and increase in pollution demands a more sweeping adoption of these strategies. Statewide change is the solution. In Washington, the Blue Paper project is underway in order to remove roadblocks to the safe and cost effective reuse of water. Like Central City Concern's Achieving Water Independence in Buildings project, it has begun by "getting everybody in one room" and already has a diverse group of stakeholders assembled to pursue statewide change.

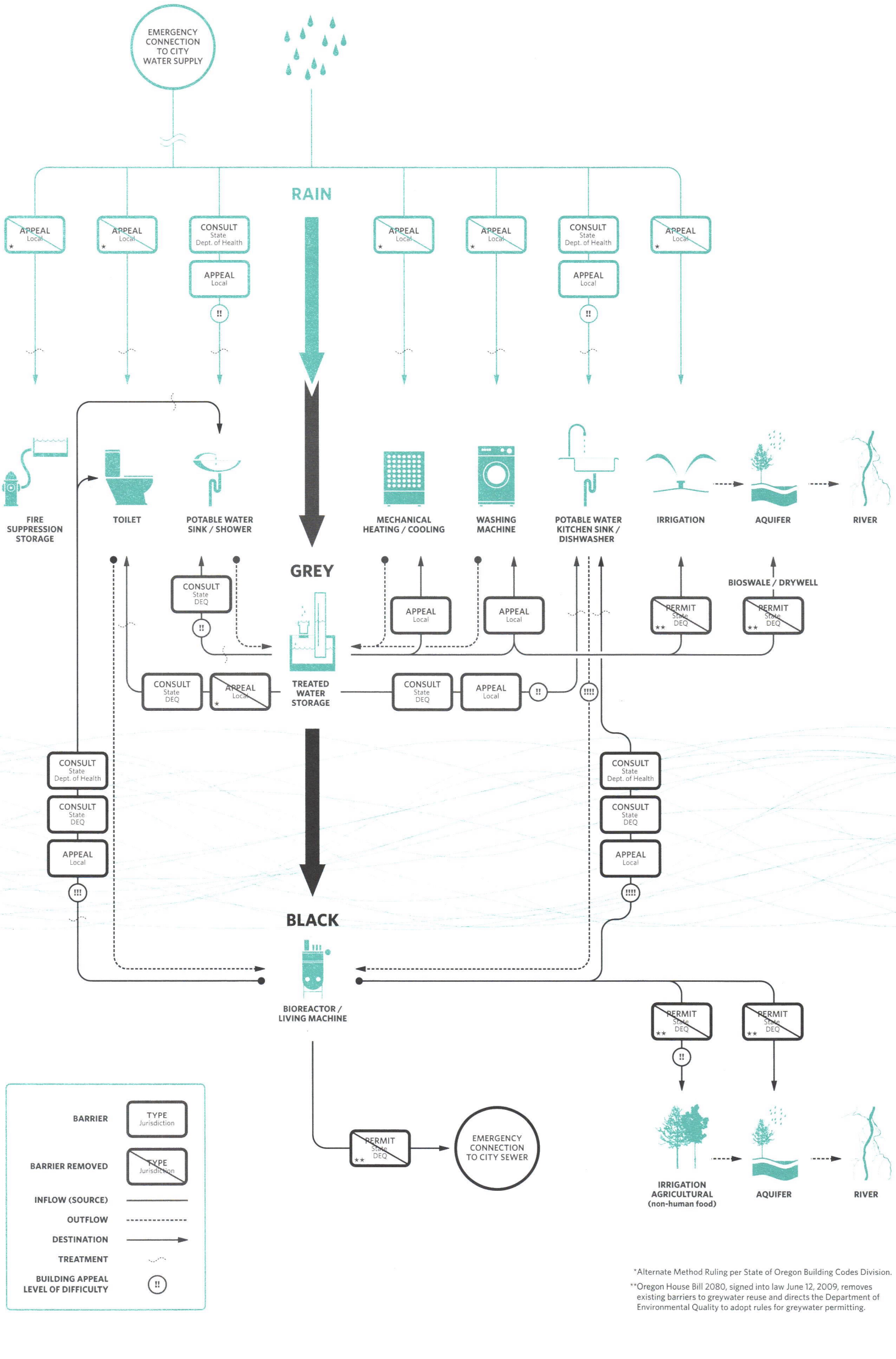
With more statewide regulatory change, perhaps national change is on the horizon. Good examples of progressive state water laws will help our national legislators and national model code authors get it right.

Ben Gates is an architect and developer of affordable housing at Central City Concern. Central City Concern's Achieving Water Independence in Building report can be downloaded from http://ilbi.org/resources/research/water/oregon.

GREYWATER GUERILLA: a team focused on promoting and installing clandestine plumbing systems that recycle greywater — the effluent of sinks, showers and washing machines — to flush toilets or irrigate gardens.

Water is the most precious, limited natural resource we have in this country... But because water belongs to no one — except the people — special interests, including government polluters, use it as their private sewers.

— Ralph Nader, 1971



*Alternate Method Ruling per State of Oregon Building Codes Division.

**Oregon House Bill 2080, signed into law June 12, 2009, removes existing barriers to greywater reuse and directs the Department of Environmental Quality to adopt rules for greywater permitting.

watershed investigations

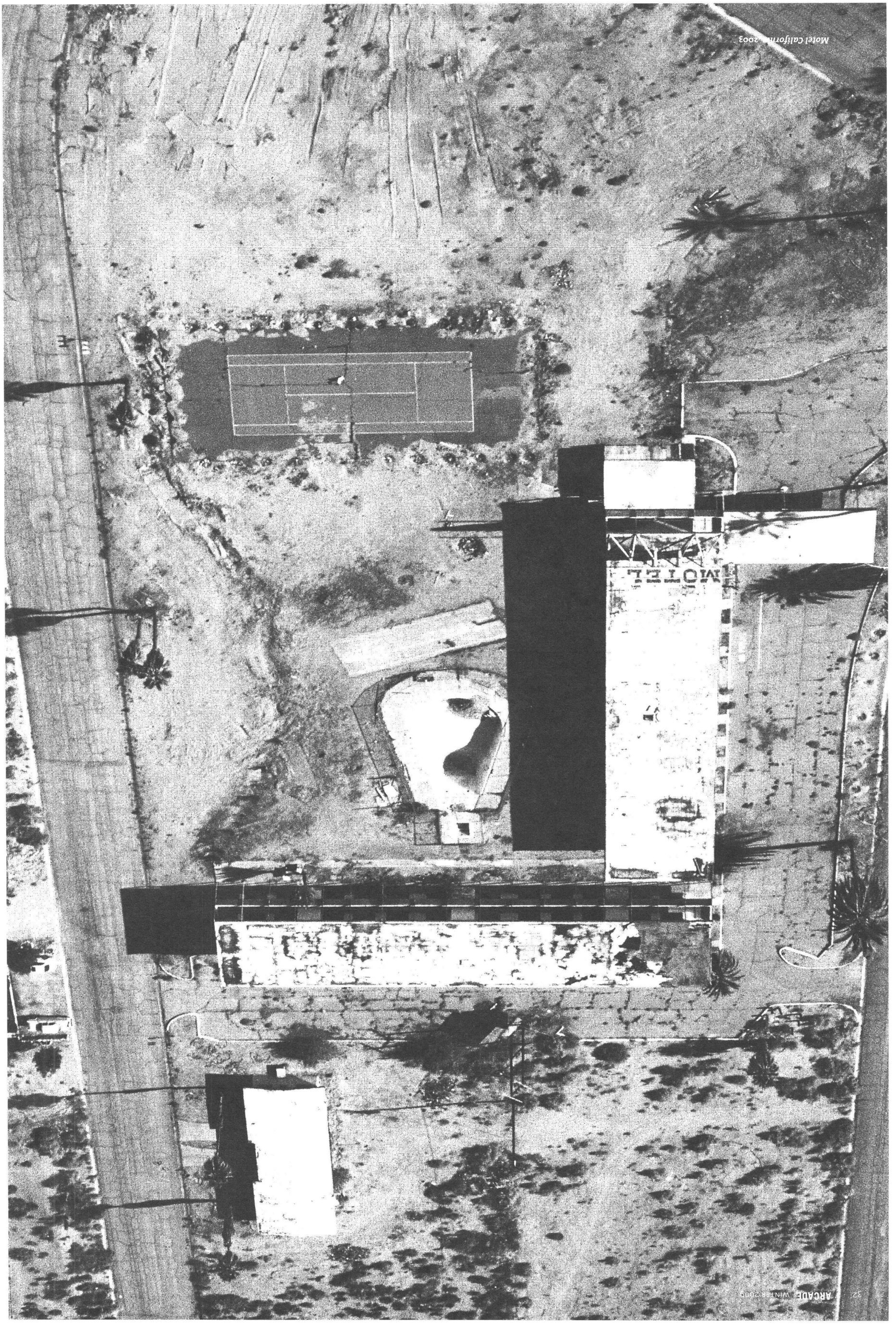
Born and raised in Washington State, Mark Abrahamson was appalled when the legendary salmon and steelhead runs in the region crashed. He became involved in local politics and later switched to aerial photography to practice his environmental advocacy.

The images from this series, *Watershed Investigations,* are aerial landscape photographs of North American riverbeds that focus on the impacts of land use on water.

For the past 20 years, Mark Abrahamson has been photographing the American landscape from small aircraft, creating aerial examinations of climate change and water. www.markabrahamson.com.

***Salton Sea #1*, 2003**

Knik Glacier Meltdown, 2006



Motel California, 2003

Sweet Tea, 1997

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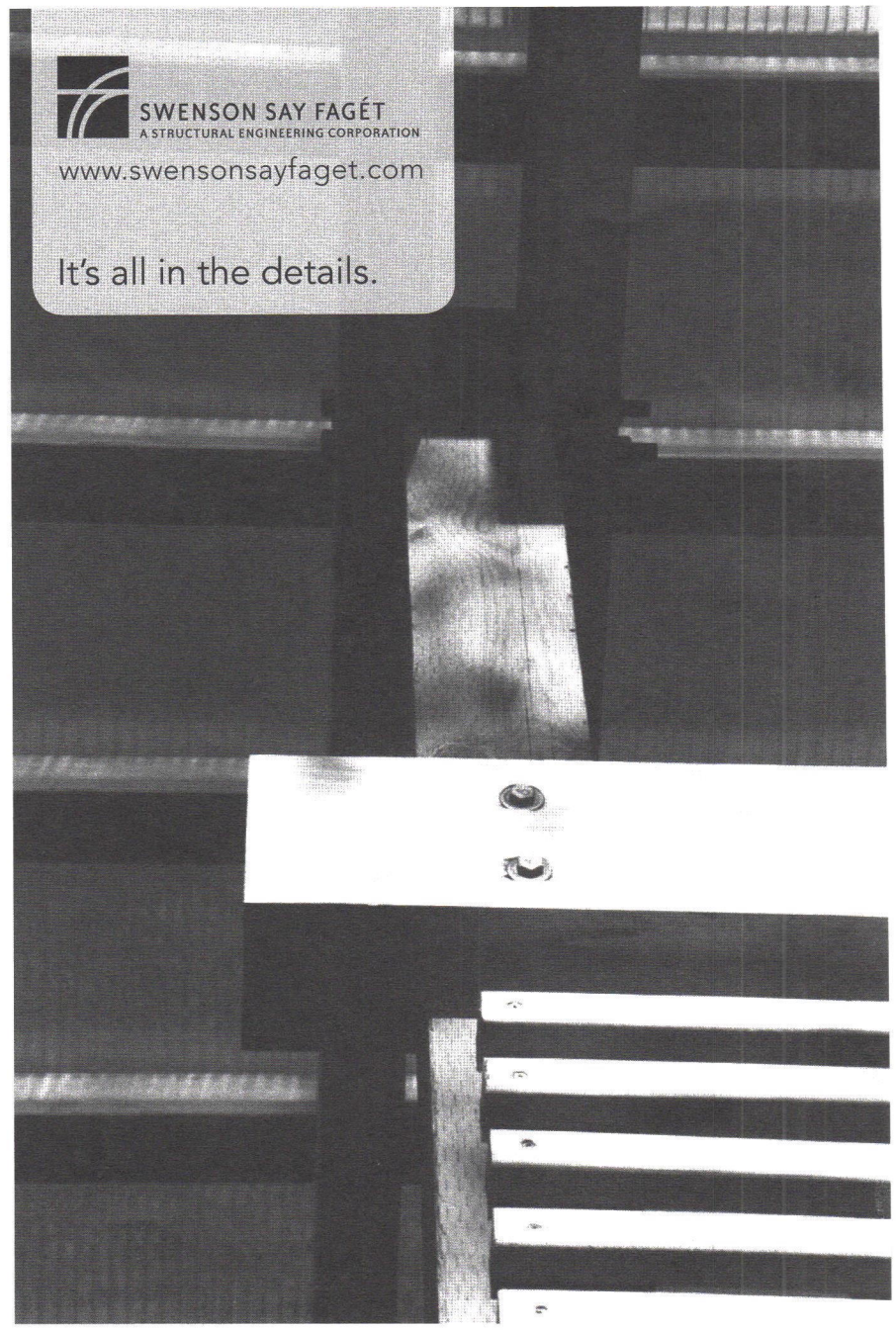

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Perspective

EDITOR'S NOTE: The following two pieces present perspectives on *suddenly*, a collaborative project that began in the Fall of 2008 in Portland, Oregon. *suddenly* is a book, a set of exhibitions and a series of public events concerning the new shape of cities.

suddenly

Matthew Stadler

The Spaces In-between Driveways

"Mothers, businessmen, bus drivers. All sorts of people dream at night in the spaces between driveways." —Danielle Dutton, *S P R A W L*

I want to know the dreams that transpire in the spaces between driveways, and I want them to matter. *suddenly* is an attempt to find language that can articulate these dreams inside a political process, such as urban planning or literature.

Since we — those who organize and enact *suddenly* — don't know how to speak about our subject, we generally begin by inviting people into an open, social space, such as a gathering or a website. Our first time around, we made a series of gatherings in Portland, OR, in October 2008. The series was catalyzed by the work of Thomas Sieverts, a German urban planner whose 1995 book, *Zwischenstadt*, seemed to provide a good starting place.

"*Zwischenstadt*" means, literally, "in-between cities." Sieverts coined this neologism to describe what most of us think of as "sprawl," though notably he did not reserve the term for the old peripheries (as we do when we equate sprawl with suburbs). Instead, he describes the whole urban fabric — from what we once called the center to the remotest reaches of the built environment — as *zwischenstadt*. All of where we live now is radically "in-between" (*in-between driveways*).

In Sieverts's terms, the landscape in which we live sits in-between city and country, freely and unpredictably intermixing elements of both; it is in-between man-made and "natural," with each force shaping the other; it is at once crowded and empty, swift and unbearably slow, changing and changeless; and, it stands in-between the local and the global because the pressures of both local particularity and global markets give it form. Sieverts asks us to engage these landscapes by inhabiting the fine grain of this radical intermixing while we put aside all our antiquated struggles about the fortunes or misfortune of the old urban "center" (or its ideological twin, the unspoiled countryside). "To comprehend and unfold [such a] landscape's formal composition," Sieverts writes, "new sources and perspectives will have to be found."

Sieverts suggests turning to the "research process" of artists and designers to find the essential openness that policy-making desperately needs. "These different approaches have in common a positive concern with uncertainty, which expresses itself through the active reconfiguration of uncertainty as a space of hope. Uncertainty is understood as a challenge, as an adventure in urban evolution, as a space that cannot be made secure but can be shaped by the imaginative projections and led toward a certain inclination. Such a space cannot be functionally determined; it is an open space of possibilities."

In Portland, first, and later in Los Angeles, San Francisco and last summer in Seattle and Burien, *suddenly* sought that open space in community gatherings and art events that could inform city planning and policy making. We led tours of Burien based on maps made by seniors and kids. We inhabited a disused gallery space in Pioneer Square where Eli Hansen's blown-glass still produced alcohol from local flora. We met with both city councils.

These explorations and the food and drink and conversations shaped language that can articulate dreams inside of politics. Sieverts, again: "When we come from the world of decoded information (the cultural landscape) into nameless and insignificant wild places, [here, Sieverts means *the spaces in between driveways*] boredom sets in at first. We cannot read what comes to us. Thus boredom becomes irritation. Only after a while does productive perception set itself going, and then the world around us starts to fill up. Empty spaces are necessary to train people in the capacities of cultural beings: decode, integrate, interpret, associate, project, remember."

suddenly seeks out empty spaces and then inhabits them for long enough to catalyze boredom, irritation, and, ultimately, productive perception.

Matthew Stadler is a novelist who also writes about art and architecture for various publications, including *Frieze, Artforum, Volume, Fillip* and *Domus*. He was literary editor of *Nest Magazine*, co-founder and editor of Clear Cut Press, and currently runs Publication Studio, a print-on-demand publisher and storefront in Portland, OR, with Patricia No.


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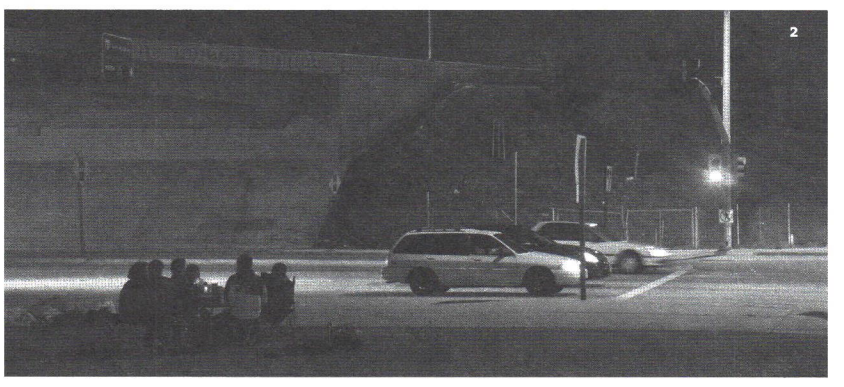
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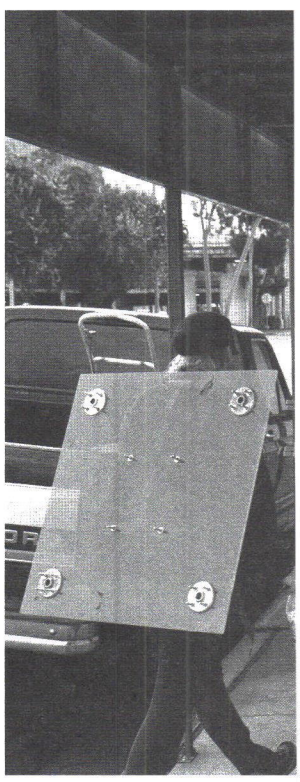


Stephanie Snyder

For Love of Kinship

"I'm very careful not to have ideas, because they're inaccurate." — Agnes Martin

Because friendship with a beloved, like understanding art, is nearly impossible, let's attune our shared para-aesthetic, sensuality — intellectual, unstable and synaesthetic — and fill it with laughter, *suddenly*. Let's discover the *topos anathema*, spiteful and brash, the one that we do not yet know how to embrace, appreciate or interact within. This space we'll resolve to love like the oily scum on the side of the freeway. Michael Damm showed us the exquisite evening sunset undulating across soot, oil and water as the earth rotated the Oakland freeway. *suddenly,* investigating with an eye toward vulnerability, and testing (our own) prejudices, we'll awaken to history and the design patterns and desires that might shape our city, countryside and that gorgeous frontier—the suburb. From the outset of this collaboration, my desire was to move farther away from the edges between works of art, and instead, bring works of art, artists, events, conversations and moments into a kind of collapse, with as many agents as possible. Evening after evening, year after year. *suddenly's* reiterative dreams are a set of operations for those who believe in drowning in the same river twice.

Typically, we remove ourselves from what we find unappealing. What is your normative anesthetic? We seek to interfere with this. And what is the difference between this and that?—Once, one, perhaps, a combatant will want to fuck you. That's a statement. That's worth voting for. Whether or not *suddenly* artist Mike Merrill should vasectomy himself, Mike asks his shareholders to vote on that, to know that's worth voting for.

Hormonal effluence, gnats and abstraction are forms for understanding the in-between space of the "where we live now."

We've dined under dripping tarps, artist Nico Wright stringing sagging billboards above our heads. Speeding along trailing honey and Gary Wiseman's drawings. We stopped at the sea to dwell on the glassy shores of Zoe Crosher's photographs. And, home. That was holy. Now what, now what becomes a moment before an interval. Love. Velocity. Rear view mirrors become portals where Hadley+Maxwell converse through time and space, from the other side of the world, creating *suddenly* together—Jen Graves lounging in front of Hadley+Maxwell's mirrored time machine for hours, telepathically connected to the world.

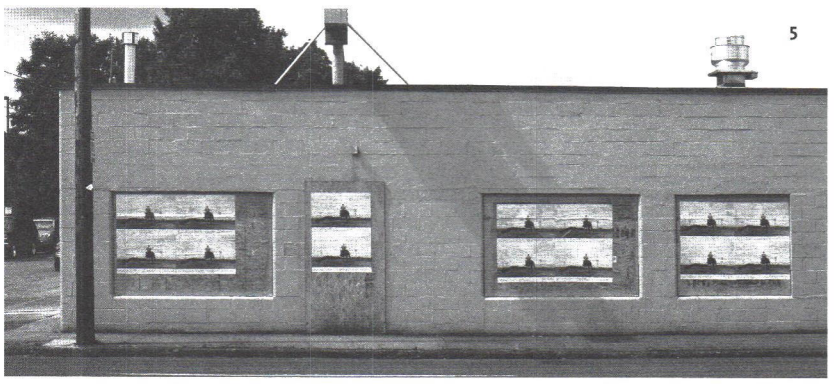
Love for a resistance to beauty, love for Oscar Tuazon and Eli Hansen's far far away that scares and attracts; their risk bears no persona.

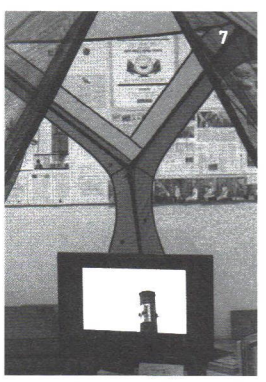
At times, the purpose of the project has felt pornographic; nothing isn't censored, but the Komos has its own mind. Messy nature; that is, *suddenly*. Elias Hansen dousing us with homemade hooch after Michael Hebb, Hanes Wingate and Michael McManus live on an island in the I-5 freeway. Portland, Seattle. What is the boundary? Many a Komos has emerged from the sympotic way findings of our feasts—many of us traveling to events without knowing why, really, we are there. Molly Dilworth reads poetry to no one at two o'clock in the morning in Thompson Square Park. She is painting rooftops for Google Satellite to relay back to her—oh heavens, find her work! Boris Sieverts and Matthew Stadler fly above Burien via Internet recounting experiences of place and interest. Did they find Mostlandia there? Spiritual home of Katy Asher and Rudy Speerschneider?

When Matthew began to talk about Thomas Sievert's work, and he and I set out on the thinking path that resulted in *suddenly*, (*Alive in the Zwischenstadt!* was our first title), an unsteady but resolute we arose, in spirit and practice. Our shared work wore a scuffed edge between us, the kind of symbolic edge space described by Lisa Robertson when she articulates the auditory edge of human habitation. Our interests rubbed and snagged, and the resultant evolving expansions and contractions of patience, communication, morality and desire, I believe, became the model for the manner in which the project unfolded and will continue.

And to be clear, this is your narrative, too.

Stephanie Snyder is the John and Anne Hauberg Curator and Director of the Douglas F. Cooley Memorial Art Gallery at Reed College in Portland, Oregon. Snyder writes regularly for Artforum.com, and in 2008-09 published catalog essays on the work of Storm Tharp, Pat Boas, Liza Ryan, David Reed and Peter Kreider. Snyder is the recipient of a 2007 Curatorial Research Fellowship from the Getty Foundation.





1. Beaverton Parking Lot Back Room Dinner with Thomas Sieverts, Aaron Betsky and Matthew Stadler, October, 2008
Photo: Stephanie Snyder

2, 3, 4 & 6. Michael Hebb's Corridor Project Expedition, Los Angeles, January, 2009
Photos: Ashwin Balakrishnan

5. Marc Joseph Berg's public poster project, Portland, August 2008
Photo: Marc Joseph Berg

7. Fritz Haeg's Animal Estates Installation, Cooley Gallery, Reed College, Portland, October 2008
Photo: Shawn Records

8. The Death of the Most: First Ritual Passage From Mostlandia, Portland, August 2008
Photo: Stephanie Snyder

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The New Milieu

Thinking about Air Today

Feature Editor
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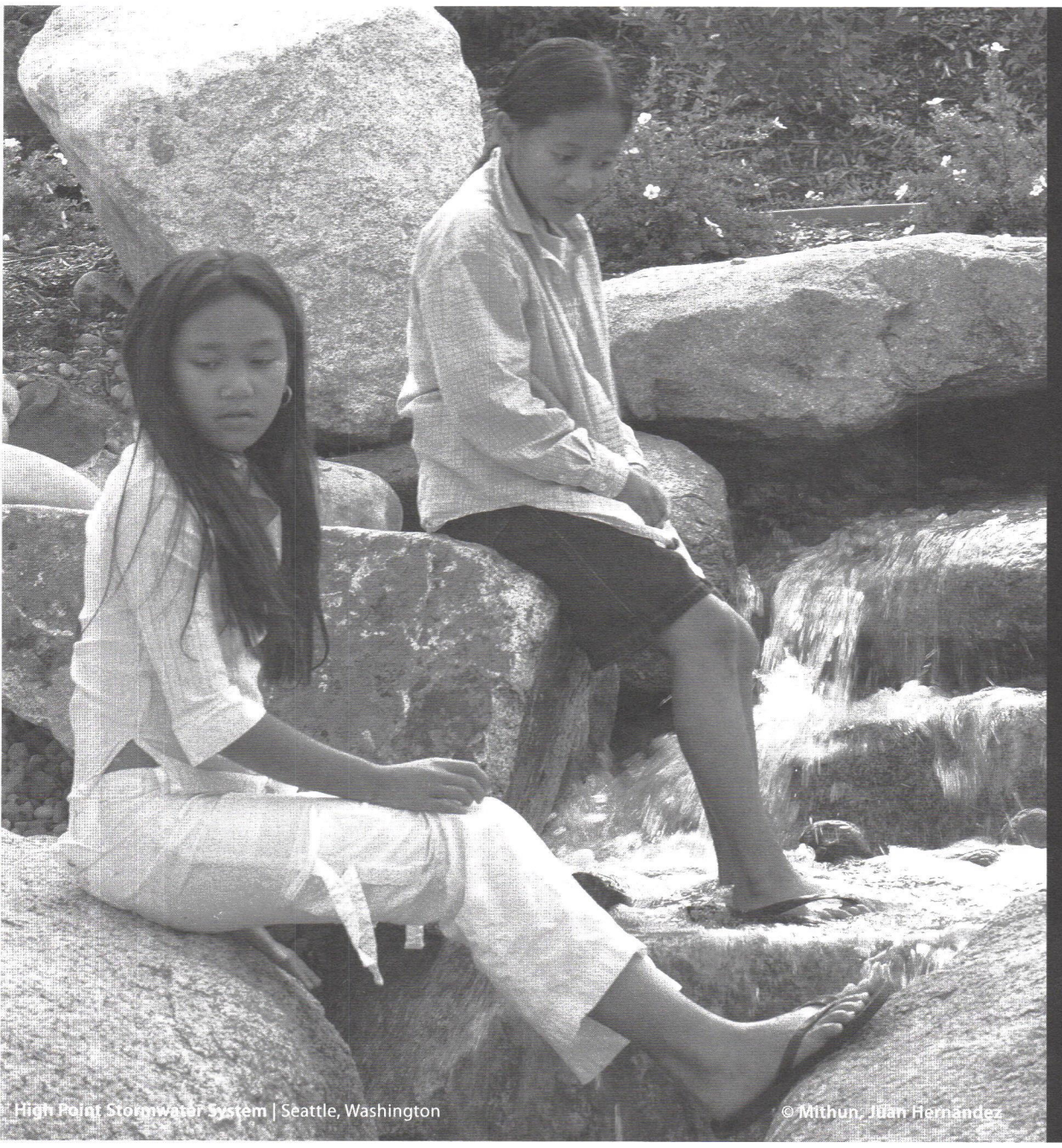

High Point Stormwater System | Seattle, Washington

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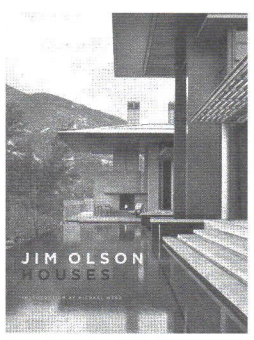
Book Review

JM Cava

Pliny's Villa and The American Country House



Jim Olson Houses
Introduction by
Michael Webb
The Monacelli Press
2009

The house looms large, if not as a refuge, as a metaphor... It is the repository of our wishes and dreams, memories and illusions. It is, or at least ought to be, instrumental in the transition from being to well-being.
— Bernard Rudofsky

The country house as an architectural idea has been with us since at least the Roman Empire, when the Eternal City, in all its political and commercial hubbub, became large, crowded and busy enough to displace its inhabitants from their prior connection to the pastoral landscape. Pliny's Villa, so affectionately described by the ancient writer and so often redrawn by generations of architects is, if not the actual first of its kind, certainly the most famous prototype. His country estate — and those it inspired — had little in common with imposing manors of officials or feudal lords designed merely as strongholds and symbols of power. The homes of Pliny's lineage were for mere citizens, albeit ones of reasonable means, whose values and daily lives entailed a high-degree of civilized comfort while maintaining intimacy with the natural world.

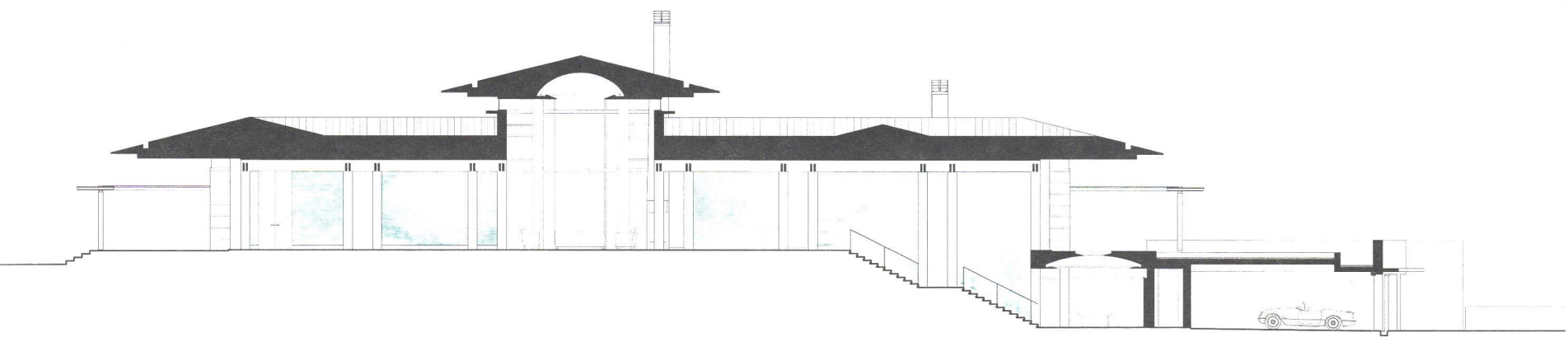
In the history of architecture, this building type wanders inconclusively amongst various styles — the most influential model being Palladio's rigidly symmetrical objects — until the early 20th Century, when the English architect/landscape team of Edwin Lutyens and Gertrude Jekyll perfected their informal, eclectic approach to the species. Immediately, a new paradigm of relaxed formality appeared in which interior axes and rooms commingled with their outdoor counterparts in ways more common to Western vernacular architecture than "high style" residences. This invigorated the country estate, and in America, the most talented Beaux-Arts trained designers like Platt, Meigs, Delano & Aldrich, Albro & Lindbergh, and even McKim Mead & White expanded on this approach, composing extra-ordinary houses open to their surroundings in graceful arrangements of courtyards, patios and gardens. Borrowing materials and forms from European farm buildings, their perennial simplicity and seamless integration of house and garden made them surprisingly, and refreshingly, modern.

Only Wright and Neutra, of the modern masters, tackled this typology. The serious moderns were generally too pedantic for this program; it wasn't a suitable framework for "statements" or manifestos, and — as Le Corbusier noted — the messiness of domestic life had a distressing tendency to distort pure sculptural form. Although the type languished to a large degree in the modern *oeuvre*, Wright — ever the contrarian — revived it with a level of ingenuity and invention that only he could muster in the expansive Coonley and Martin houses and his own Taliesin in the early 1900s. Subsequently, there were few serious practitioners of the contemporary, American country house, so that Jim Olson's connection with a handful of well-heeled clients with some serious art on their hands allowed him to reestablish the type, wherein he proceeded to explore some modern spatial ideas. Clearly, the majority of these houses are indebted to Wright's own spatial explorations from his prairie period, which one could argue contain Wright's most enduring contributions to architecture. Olson has not only deftly developed Wright's spatial gestures, both in plan and in section, but he has layered onto these compositions many lessons from his other apparent mentor, Le Corbusier, incorporating the Swiss master's expressive and emotive use of reinforced concrete that he evolved in his later work.

What at first might seem an improbable architectural collusion (the two titans publicly eschewed one another's work) in fact provides the inspiration for spatial compositions that combine classical clarity with a horizontal and vertical layering of space. This layered/axial technique creates movement in and around adjacent indoor and outdoor spaces, provides opportunities for filtering light in unexpected ways and allows spaces to merge and then separate, all within a trabeated structure of imposing presence and density that is somehow both connected to the earth and surprisingly open.

Make no mistake about it — these homes, with the possible exception of Olson's family cabin, are grand edifices in which one feels certain behaviors might be more appropriate than others. But there is a difference between grand and grandiose, and, given the secondary function of most of these buildings as art galleries, they come to terms with an inherent incongruity: that of integrating two building types that normally have little in common. And so, despite the axial planning, high ceilings and muscular tectonics, Olson's rooms are endowed with a sense of intimacy that underlies their more palpable monumentality. To this end, he's wisely employed Nature, whose contribution toward achieving a comfortable scale here is considerable.

The clients represented in this book are not thrust onto center stage as in the shelter magazines, poised with their dogs or cooking up a flambé, but are oddly present throughout the book, as Michael Webb emphasizes in his insightful and highly readable introduction. Olson clearly considers these individuals pivotal to his designs, a *sine qua non* of the process to whom the projects are continuously answerable throughout the often lengthy process of design. Although this is the approach found in most office brochures, it is not by any means the norm in houses like these, particularly with a designer of Olson's stature. For them, the client is in the way, an impediment to achieving a grand design.



OPPOSITE PAGE:
Hong Kong Villa section

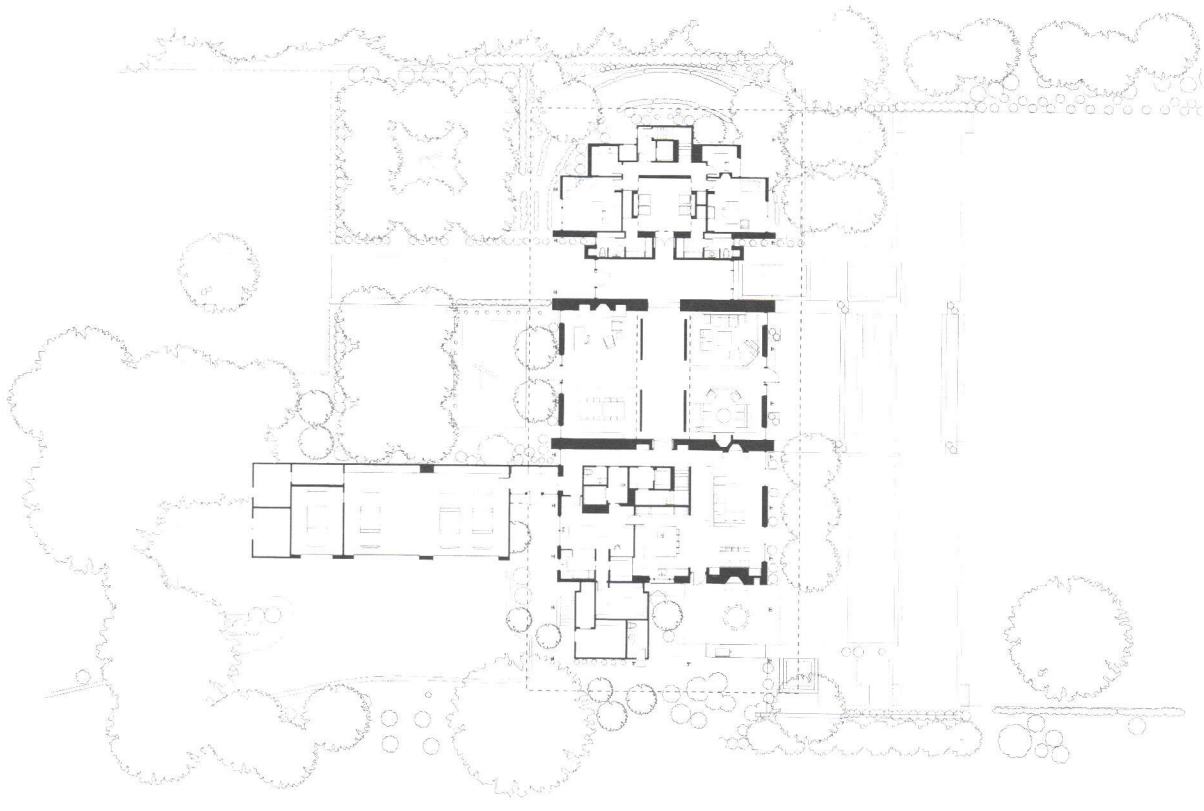
THIS PAGE:
House of Light interior and plan

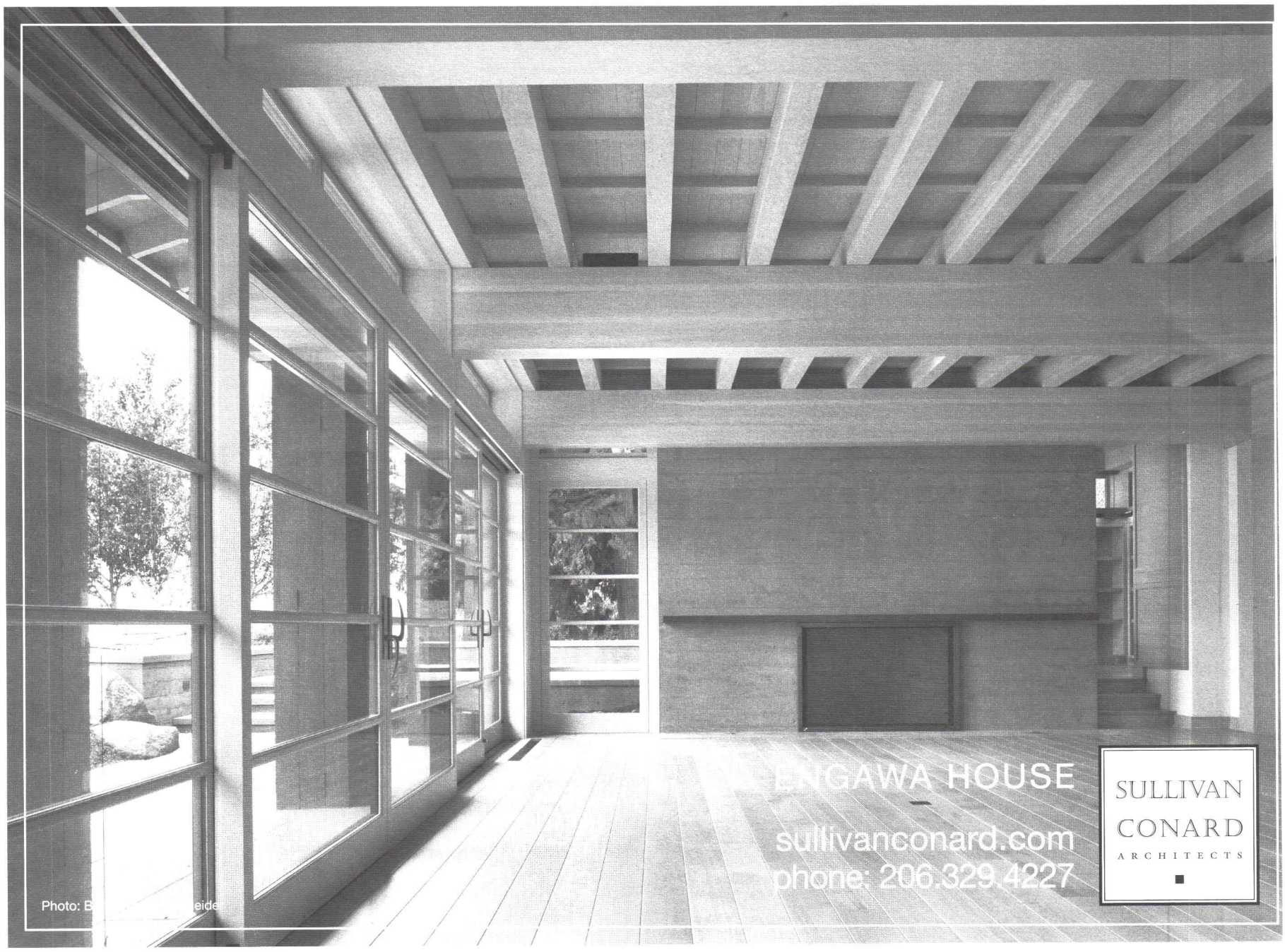
Photo: Ben Benschneider

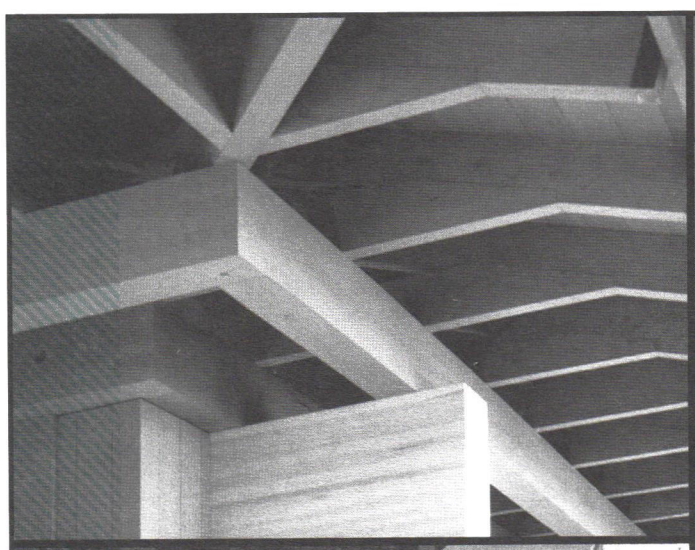
Not so for Mr. Olson. These clients appear to desire a civilized place not only to live, think and entertain, but to display and enjoy their significant art collections, all the while entwined with the bucolic landscape in which they chose to build. In short, they wanted Pliny's Villa and — as the houses in this book reveal — Olson has both reinterpreted and reinvigorated this type in his unabashedly modern vocabulary, replacing the country house syntax of Old World chateaus with something original and refreshing and clear.

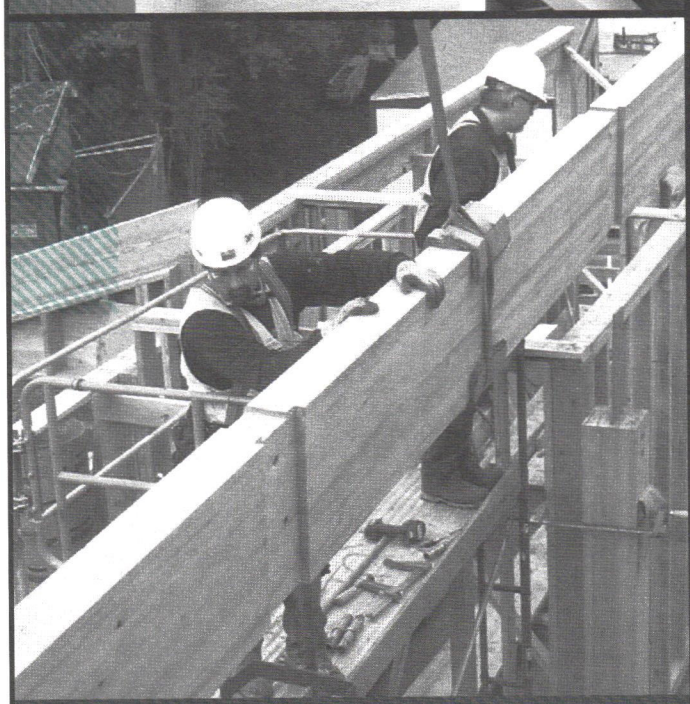
The houses presented here are, as Pliny described his own living quarters, "...big enough to be comfortable, but by no means palatial." As such they employ architectural principles that would succeed in any home, regardless of size. For Olson has achieved the rare goal of discovering an architectural language firmly steeped in tradition, a modern tradition that embraces contemporary technologies while respecting the perennial longing of our homes to be permanent and substantial yet intimately connected to the natural world. No doubt Pliny would be pleased.

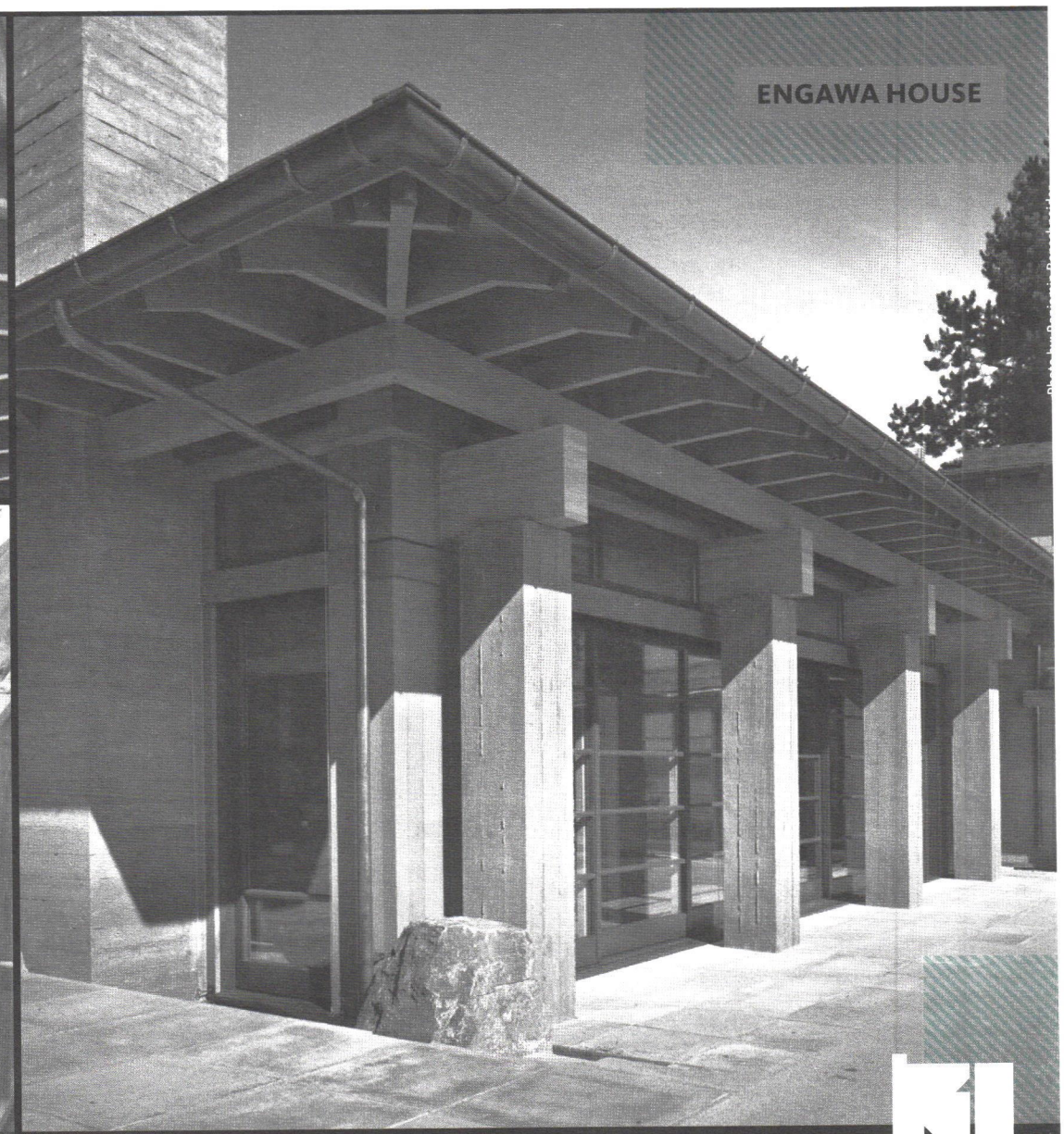
JM Cava is an architect in Portland, where he teaches writes and designs buildings and gardens.











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End Note

ARCADE Celebrates its Friends and Donors

Long-time ARCADE enthusiasts and supporters Victoria and Gary Reed opened the doors to their new, Sullivan Conard designed "Engawa" home on September 26. Over 150 of ARCADE's friends came together to form a special evening that included old and new supporters, a special performance by Tim Janof (who composed a piece combining ARCADE's Volume 28 theme of *A New Alchemy* with the opening of a new home) and tours of Seattle's Engawa House.*

*en•ga•wa [eng-gah-wah]

Noun: a floor extension at one side of a Japanese-style house, usually facing a yard or garden and serving as passageway and sitting space. Origin: Japan, equivalent to en edge, veranda (MChin, equivalent to Chin yuán) + -gawa; combined form of kawa (earlier kafa) side. Dictionary.com Unabridged. Based on the Random House Dictionary, © Random House, Inc. 2009.

CLOCKWISE FROM TOP LEFT:

Doug Rasar, Victoria Reed, Andrea Selig

Tim Janof, electrical engineer at Sparling

Peter Conard , Colleen Willoughby, Stephen Sullivan, Deehan Wyman, Linda Wyman

Group enjoying the party outdoors

Photos by Michael Burns

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