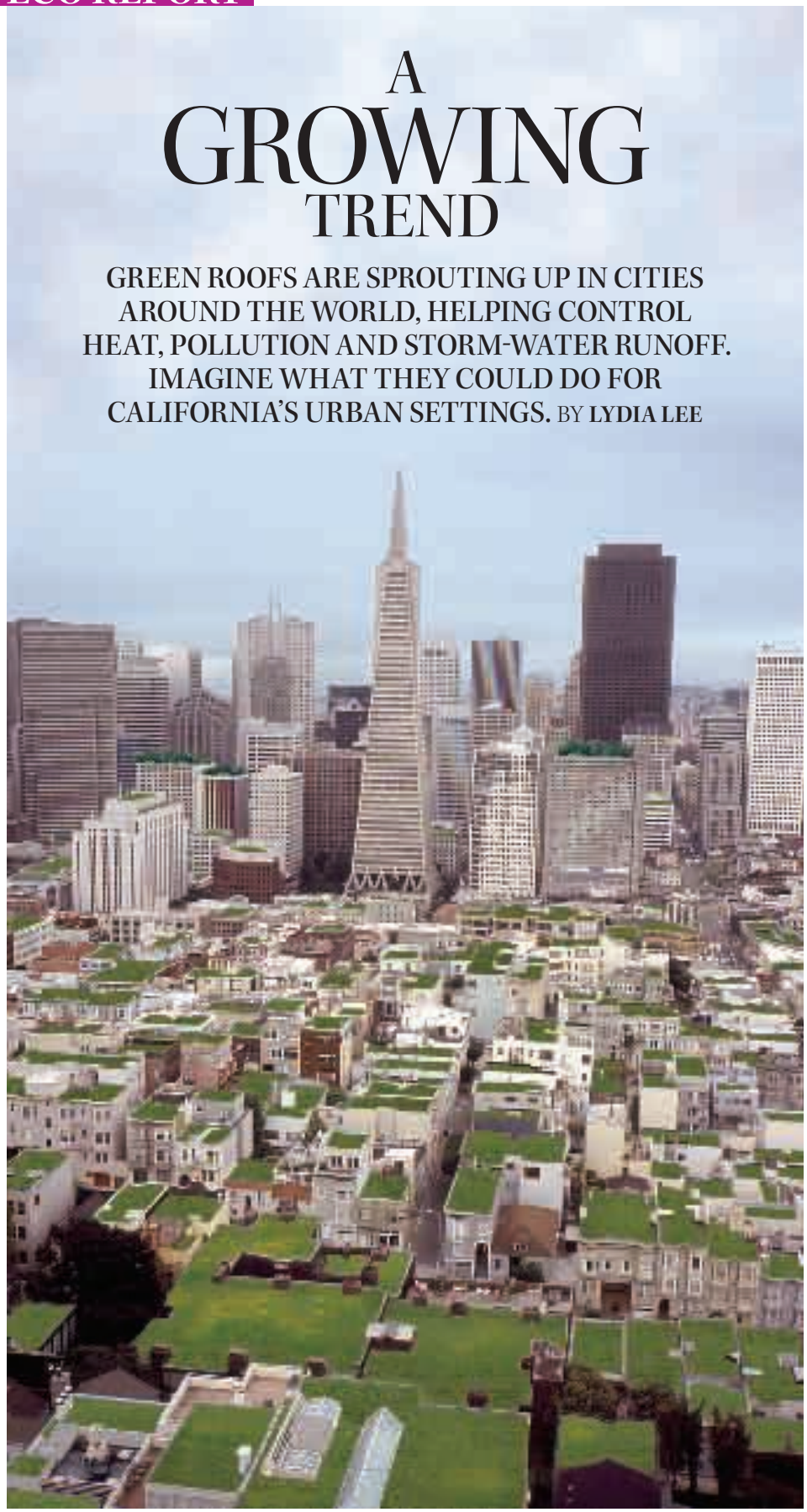
A GROWING TREND

GREEN ROOFS ARE SPROUTING UP IN CITIES AROUND THE WORLD, HELPING CONTROL HEAT, POLLUTION AND STORM-WATER RUNOFF. IMAGINE WHAT THEY COULD DO FOR CALIFORNIA'S URBAN SETTINGS. BY **LYDIA LEE**



A digital representation shows what downtown San Francisco would look like if nearly every building had a green roof.

PHOTO ILLUSTRATION BY DON LEWIS

This spring, after one of the rainiest seasons on record, five of the San Francisco Bay Area's flooded counties were declared federal disaster areas. Meanwhile, Los Angeles continues to be the nation's smoggiest city, with temperatures rising on a steady trajectory from summer to summer. In the asphalt jungle, extreme weather can have extreme effects. It's no wonder that green roofs—an established practice in Europe—are now being investigated by California cities looking for a little more harmony with nature. Also called a living roof or eco-roof, a green roof is simply a rooftop designed to support living plants year-round.

"There's a huge lack of plants in our city," says SF–based architect Jonathan Feldman. "With a green roof, you can have a garden instead of space that would otherwise go to waste. And there's a whole range of ecological benefits." Those benefits resonate with city planners as well as eco-conscious designers and homeowners.

EMERALD CITY

Since the 1960s, when German cities pioneered the modern green roof, the development of the technology has been driven as much by the promise of solving environmental problems as by the aesthetic appeal of beautiful rooftop gardens. Over the past few years, other cities have begun to adopt them along with other measures in their environmental building programs.

RIGHT: With the first city-sponsored green roof in the US, Chicago's City Hall is also a haven for bees, who produce about 100 pounds of honey every year.

"Green roofs express the core values of the city we're trying to create."

In the U.S., Chicago—with 2.5 million square feet of green roofs under development—is using them to absorb rain from seasonal storms that flood drainage systems, as well as to help the city deal with intense summer heat waves. Cities, with their expanses of asphalt and concrete, have been documented to be as much as 15 degrees hotter than their surroundings—a phenomenon known as the "urban heat island" effect. Planted surfaces don't absorb and retain heat the way asphalt or tar roofs do, and they also provide a layer of insulation. By lowering temperatures naturally, green roofs save energy used for cooling and reduce ozone levels.

The San Francisco Public Utilities Commission is considering incorporating green roofs into its wastewater management program; the agency plans to install a prototype roof on the Department of Building Inspection offices this year. "We are trying to create a new form of urbanism—you might call it ecological urbanism," says Gabriel Metcalf, executive director of the San Francisco Planning and Urban Research Association. "The idea is to have this high-density, California city life that's no longer in conflict with nature. On a symbolic level, green roofs express the core values of the city that we're trying to create."

ABOVE AND LEFT: The green roof on the Gap building in San Bruno, designed by William McDonough, is planted with grasses native to California coastal grasslands, a threatened local habitat. A wall of windows on the top floor (above) offers a view of the re-created meadow.

On a very tangible level, they also provide natural landscapes for people to enjoy. Like hundreds of other residents and office workers in downtown Chicago, Sadhu Johnston, commissioner of the city's Department of Environment, looks down onto City Hall's green roof. Describing the scene on a July afternoon, he says, "I see a beautiful prairie with yellow and purple flowers, some white butterflies and a couple of trees blowing in the wind."

The aesthetic appeal of green islands in a sea of pavement has not gone unnoticed by commercial interests. Instead of a drab gravel rooftop, guests at the Four Seasons hotel in Boston look down on

FROM TOP: COURTESY OF THE CITY OF CHICAGO; MARK LUTHRINGER

LEFT: The dining hall of the Presentation Retreat & Conference Center in Los Gatos, designed by Berkeley-based Daniel Smith & Associates, is a straw-bale building with a green roof and solar panels.

greenery planted in a striped pattern. In Los Angeles, downtown developer Tom Gilmore is in negotiations to fund a green roof on the L.A.P.D. parking structure next to one of his new high-rise residential structures for the very same reason.

A ROOF WITH A VIEW

Outside of the city, architects have long been alert to the visual purity of green roofs, using them as the equivalent of an infinity-edge pool. "It helps a house blend in and almost get lost among the vegetation," says architect Mickey Muennig, who designed the cottages at Big Sur's Post Ranch Inn, among several other green-roofed dwellings, as a way to respect the area's dramatic landscape.

"We can build restorative buildings—buildings that give back more than they take."

ABOVE: Architect Jonathan Feldman put a 500-square-foot green roof atop a Noe Valley garage. LEFT: The Mickey Muennig–designed Post Ranch Inn in Big Sur is famous for its ocean-facing green-roofed guesthouses built into the cliffside.

For both city and country homes, a green roof can create a more comfortable interior. In addition to helping naturally cool a house (and retain heat in the winter), a thicker roof can also provide better sound insulation—reducing street noise by as much as 40 decibels, according to one test. Plants also act as natural filters for pollutants in the air as well as in the water.

"We can build restorative buildings—buildings that actually give back more than they take," says Steven Peck, president of Toronto-based nonprofit Green Roofs for Healthy Cities. "The water that drains off a green roof is cleaner than the rainwater that falls on it, it can have more biodiversity than the footprint it replaces on the earth and it provides extremely healthy indoor air."

There may soon be more than simply ecological incentives for green roofs. In Big Sur, where coastal views are considered public property, green roofs are one of the only ways to get approval to build anywhere in view of the highway, according to architect Muennig. To encourage homeowners to help green the city, Chicago provides various incentives, including fast-track status for building permits—something both Los Angeles and San Francisco are considering.

"We're not expecting families of foxes to move downtown," says Gretchen Hardison, a Los Angeles–based environmental affairs officer working to get a couple green-roof pilot projects off the ground. "But having some more songbirds instead of just pigeons and crows and bringing some natural respite to the city would be great." ■

For more information, see resource guide, p. 165.

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