

The INNOVATION ISSUE



# San Francisco

INSPIRED MINDS,

BOUNDARY-BUSTING IDEAS

LOCAL ORACLES  
on LIFE in  
2023

*Anya Fernald's  
Empire of Meat*

DESIGN SUPERSTAR  
YVES BÉHAR  
REMAKES OUR WORLD

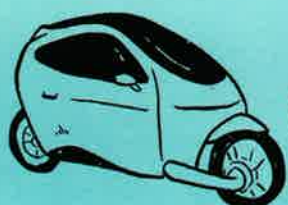
BENIGN  
MIND  
CONTROL



THE  
EXPLORATORIUM:  
IT'S BACK,  
IT'S BETTER!

Sir Richard Feachem  
ON THE End of AIDS

DONATE  
your SPIT  
to SCIENCE



The  
Uncrashable  
Tynoscopic  
Motorpod

THE  
END  
of  
TRASH



INSTANT SKYSCRAPERS

THE  
INCUBATOR-  
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Chris Anderson on  
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TELEKINETIC TOYS

But Still No  
Time Travel  
(SORRY!) ☹️



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MODERN LUXURY


  
Greg Beato


  
PETER BELANGER

THE OLD EXPLORATORIUM  
WAS WELL-MEANING  
AND BELOVED. BUT IT  
WAS ALSO DOWDY AND  
HIDDEN AWAY. NOW,  
IT'S ANYTHING BUT.

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# THE Wonder Piers

**I**NSIDE THE DARK INTERIOR OF A SMALL TRAILER parked on an esplanade abutting Pier 15, light streams through a hole in a side panel and reproduces a spectral portrait of the city on the opposite wall. “It’s a classic camera obscura,” says Shawn Lani, curator of outdoor exhibits at the Exploratorium, whose new home is on this windblown outpost on the bay. As with all camera obscuras, the image it renders is upside down. There’s the inverted Transamerica Pyramid. There’s the pedestrian bridge that joins Pier 15 with Pier 17 and, hovering above it (that is, below it), a shimmering quadrangle of the bay. Cars navigating the Embarcadero register as horizontal flashes of light.

“Camera obscuras have been done hundreds of thousands of times. So when anyone makes one, they say it’s the biggest one in the world, even if it isn’t,” Lani says. But he has a different selling proposition in mind. Somewhere nearby, craftsmen are building a carriage compartment that will house the camera obscura and seat two comfortably. Eventually, the compartment will be mounted on a trike that Exploratorium staffers will use to transport patrons up and down the Embarcadero. In other words, in a sly nod to the ever increasing portability of our high-tech gadgets, it’ll be a mobile camera obscura. It’s called the Rickshaw Obscura, and it will offer its passengers a moving, upside-down perspective on the city that surrounds them.

Looking at familiar landscapes from a novel perspective is a central theme of the new Exploratorium. And it’s not just the Transamerica Pyramid that Lani and his colleagues aim to portray in bold, sometimes disorienting, new ways: The same applies to the Explor-





LIFE IN 2023

# Sir Richard Feachem

GLOBAL HEALTH EXPERT AT UCSF, FOUNDED EXECUTIVE DIRECTOR OF THE GLOBAL FUND

## MALARIA AND AIDS RACE TO EXTINCTION

"I can't exactly say 10, but in 12 years, over a third of the 102 countries that currently have malaria will be malaria-free. As for the HIV/AIDS epidemic, it will spiral downward significantly. We've made two discoveries recently: that putting an HIV-positive individual on anti-retroviral medication as soon as possible is better for his long-term health, and that someone on treatment is 96 percent less likely to transmit the disease to a sexual partner. This knowledge, along with behavior changes, condoms, more aggressive testing, and male circumcision, will drastically reduce the number of new transmissions."



The gleaming new Exploratorium retains some funky elements that reflect the spirit of the original.



"Visualizing the Bay" is a computer-controlled map that can display an unlimited amount of data.

atorium itself. For 44 years, the beloved institution's trailblazing efforts in the realms of DIY science, interactivity, and the commingling of art and technology have radiated throughout San Francisco, the Bay Area, and the world at large. And yet, because of its setting in a sleepy residential swath of the Marina district, it was never quite the civic hub it could have been.

Now, however, as the Exploratorium moves into a \$220 million retrofit of Pier 15, reaching 800 feet out into the bay in the midst of prime tourist migration routes, it becomes possible to envision a more central place for the museum in the life of the city. With nearly triple the exhibition space of the original location, the new facility will feature approximately 150 new exhibits (of a total of 600), two foodie-friendly cafés under the direction of Cocco500 chef Loretta Keller, giant outdoor art, and a forum with cabaret-style seating for film screenings and live events. Even the construction incorporates the principles of the institution, including a water-pump system that uses bay water to heat and cool the building.

All these upgrades are expected to double the number of annual visitors to a million. But however big and popular the Exploratorium gets, it is still linked in a direct line to its visionary founder, Frank Oppenheimer, whose influence has been rippling through the region for more than 40 years. Oppenheimer and his colleagues were the original Bay Area geeks, spiritual predecessors of Maker Faire, Burning Man, *Wired*,

artisanal handcrafted everything, and several generations of Internet entrepreneurs. The new building just adds the latest chapter to the story.

**IN 1969, WHEN OPPENHEIMER** moved into the Exploratorium's original location at the Palace of Fine Arts, one of the first orders of business involved cleaning out the bird nests, mouse nests, and pine needles that had accumulated inside the building. (Among other incarnations, it had once served as a Christmas tree lot.)

Although the Exploratorium added many improvements over time, it never really stopped looking like a place where you might come across one of those nests in some dusty corner. It was dark and unheated. It was cavernous. For

many years, it didn't have indoor bathrooms. "San Francisco society was far more comfortable in proper museums with paintings in gilded frames," writes journalist K.C. Cole in her excellent 2009 biography of Oppenheimer, *Something Incredibly Wonderful Happens*. "The Exploratorium was a little scuzzy for their tastes."

Still, for Oppenheimer, the Exploratorium was, above all else, a realm of perception and participation. Transparency was so important to him, Cole recounts, that he once "had a fit" when an exhibit developer used glue rather than screws to join some pieces of plastic: He wanted visitors to easily discern how the exhibits had been fabricated.

In the new Exploratorium, that emphasis on clarity lives on. The

machine shop where exhibits are built is more visible than ever. The Tinkering Studio, where visitors are encouraged to pursue their own projects, will have many more tools and materials to choose from. The outdoor space, a portion of which will be open to anyone who walks by, not just ticket holders, will give the public a chance to interact with some of the exhibits.

On a visit to the new Exploratorium one afternoon last January, I arrive to find the spirit of Oppenheimer in full effect. A handful of staffers are standing on a second-floor terrace connected to the Bay Observatory, an all-glass box at the end of the pier that was constructed to house the Exploratorium's main restaurant and an expansive gallery focusing on the ecology of the Bay Area.

The staffers are looking at the Bay Bridge through a \$1,600 Swarovski spotting scope that seems, on such a clear and bright day, a little like overkill. Here, at the end of the pier's 800 feet, the bridge feels amazingly close, and the bay yields sharply etched details even to the naked eye—whitecaps moving north toward the Golden Gate, chevrons of gulls.

Still, these folks work for an institution whose holy grail is awareness. Close observation is their *raison d'être*, the place where both science and art begin, so of course they are looking through a spotting scope. And, fittingly enough, given the intentions of the gallery they're developing, what they're looking at is the bridge tower that was sideswiped by a 752-foot oil tanker two weeks earlier. The tanker damaged a 50-foot stretch of the tower's protective fender, and today it appears that repairs, or at least assessments, are under way.

That this ► CONTINUED ON PAGE 95



## SO, WHAT ELSE IS NEW?

Four more eye-opening Exploratorium exhibits.

### FOG INSTALLATION

Created by Tokyo-based artist Fujiko Nakaya, this project is the first in the Exploratorium's "Over the Water" program, which will present a newly commissioned large-scale artwork each year in outdoor public space near the pier. Using high-pressure, pure-water fogging systems, Nakaya creates immersive environments swirling with so much dense but ethereal fog that you'll think you've landed in heaven—or a heavy metal video from the '80s.



### PLANKTON POPULATION

This giant iPad lookalike displays information on plankton all around the world. "Plankton are the base of the marine food chain," says associate curator Jennifer Frazier. "Without them, there would probably be no other sea life. No polar bears, no salmon. Plus, they produce half the oxygen humans breathe, and they absorb more carbon than all the forests on earth, so they're really important for understanding climate change."



### TREE EXPERIENCE

Ten years ago, an enormous 330-year-old Douglas fir in Olema was felled by strong winds during a storm. Now, the Exploratorium is recycling this majestic hunk of nature as art. Sit between two giant halves of the fir on a bench made from the same tree, marvel at the gnarly tendrils of the giant root ball, and try not to compose a haiku about nature's delicate balance of order and cataclysm—it's impossible.



### TEAM PAC-MAN

"The West Gallery is about social phenomena and psychology—how people share resources and negotiate," says Tom Rockwell, director of exhibits. One example: Team Pac-Man. Here, the classic arcade game requires two to four people because it is designed in such a way that each player can move Pac-Man in one direction only. In 2013, it takes a village to defeat Blinky, Pinky, and Clyde.



LIFE IN 2013

## Tiffany Shlain

FILMMAKER,  
FOUNDER OF THE  
WEBBY AWARDS

### THE INTERNET, IN MODERATION

"Everyone on the planet will be online who wants to be online. But you'll see more and more of these people setting boundaries regarding when it's beneficial to be online and when it's not. I think people are going to realize that anything in excess is not good for the mind or the soul. What won't change is our need to authentically connect as humans. While we will have new ways of connecting digitally, nothing compares to real world interactions."



⇒ WHY SPEAK WHEN SIMPLY THINKING WILL DO THE TRICK? San Francisco's **Puzzlebox** sells a **toy helicopter that's guided solely by raw brainpower**. With an EEG attached to a headset, the company's "brain-computer interface" picks up the brain's electrical activity and, when your concentration reaches a certain level, launches the Orbit, a battery-powered whirlybird. It won't be long, says Puzzlebox founder Steve Castellotti, before we're using similar headsets to change TV channels, turn on lights, and, one day, move a cursor on a screen. *BEN CHRISTOPHER*

## INNOVATION: THE WONDER PIERS

► CONTINUED FROM PAGE 75 | latest accident marks the second time in just over five years that a ship has struck the Bay Bridge suggests the challenge faced by the Exploratorium: If even ship captains and bar pilots are so oblivious to their surroundings that a giant suspension bridge could catch them by surprise, imagine how unaware laypeople are.

**AS AN ANTIDOTE TO SUCH** inattention, the gallery in the observatory is filled with exhibits designed to help visitors get a deeper sense of the bay and the surrounding land. The simplest among these are maps from different eras. There's one from the 1800s that shows San Francisco when its shoreline extended no farther than where the Transamerica Pyramid is now. There's one from 1905 that shows how famous urban designer Daniel Burnham dreamed of developing San Francisco: A 4,764-acre park starts at Twin Peaks and doesn't stop until it hits the Pacific Ocean.

"People have been afraid to touch them because they think they're

too nice," says senior project manager Kristina Larsen. But they are there to be touched, exotic artifacts from a world before maps required batteries.

The most impressive exhibit in the gallery at the moment is a little more technologically advanced. It's a map, too, but a map for the 21st century. Called "Visualizing the Bay," it's basically a topographical map that staffers have been developing for seven years now. It was carved from two solid blocks of maple and then finished with a subtle coat of whitewash. A beautiful piece of work, remarkably detailed and painstakingly rendered, it's an absolute triumph of artisanal Appalachian woodworkers were involved in the process.

Instead, the map was carved via a computerized router using satellite data from U.S. Geological Survey digital elevation models. The result approximates, in three-dimensional form, the entire Bay Area, including the floor of the bay. "When you touch it, you can feel very subtle things," says scien-

tific content developer Sebastian Martin. "Here, for example, is a channel. And over here, where the Golden Gate is, you can feel that it's the deepest part of the bay."

What make this topographical map different are the computer and the projector system that work with it. Click a few buttons and twist a few dials on the control panel, and information populates the blank terrain. Today, Eric Fischer, an artist-in-residence at the Exploratorium, has brought several data sets to play with. The first uses material gleaned from Twitter that shows where visitors to the Bay Area tend to congregate compared to where locals go. Another uses U.S. Census data to show population densities by age. "If you're nine years old and you want to see where the other nine-year-olds are, you can," Fischer explains.

In the end, the possibilities are limitless—whatever information staffers can collect, they can depict. At one point, Martin displays a data set showing every earthquake that has occurred in the region since 1973. Another set, from a National

Oceanic and Atmospheric Administration lab, shows fog rolling over the hills of the Marin Headlands in mesmerizing fashion.

Each of these depictions alone is interesting, but ultimately, it's the interplay of all the model's elements that makes it so engaging. It's an emphatically tangible object, a solid and unchanging block of maple, and at the same time, it's infinitely mutable. It's a teaching tool with a very specific domain, but it's also a meditation on the passage of time, the way things change radically and yet not at all. All that action (earthquakes! suburban real estate booms! fog!) gets depicted on the model, but when you look outside the window, the very real topography looks nearly as fixed as a map.

Now, the same thing is happening at the Exploratorium. It's undergoing a major metamorphosis, but only to become more and more itself. "This much change all at once can be very scary for an institution," says Lani. "But one thing we cannot afford to be is afraid. You don't generally innovate on your heels. You innovate on your toes." □