California Academy Starts on The Museum of Its Dreams

The California Academy has embarked on the first step of an ambitious two-stage experiment aimed at creating a landmark natural history museum

SAN FRANCISCO—In 1996, the California Academy of Sciences got some bad news: San Francisco's new mayor, Willie Brown, wanted the academy—a popular San Francisco attraction that includes a natural history museum, an aquarium, and a planetarium—out of its prime location in Golden Gate Park. While staff members wrung their hands about where to relocate and at what cost, the academy's supporters spoke out against the idea, and by 1998 the plan had collapsed under a wave of public protest. And as it turned out, the threat of being moved did the academy a favor. In the intervening period, academy scientist Patrick Kociolek had become its new director, and he and his board had begun to rethink the institution from the bottom up, taking note of San Franciscans' strong support. They halted plans for a modest retrofit of the academy's aging buildings and instead planned the most expensive cultural construction project in San Francisco's history—a new landmark for the city, as well as for the worldwide museum community.

Now Kociolek's dreams are edging toward reality. On 31 December 2003, the old academy closed its doors. In 2008, a dramatic new building, designed by a star architect and filled with cutting-edge exhibits and research space, is to reopen in the same spot near the Golden Gate Bridge. And in true scientific form, Kociolek (pronounced Ko-SEL-ik) has turned the two-stage move into an experiment in museum practice. Next month the academy will open in temporary quarters and begin testing a variety of innovative approaches, such as employing retail experts to help design exhibits; bringing research into public view with a slew of programs, including inviting visitors to work as co-researchers; and putting a continually changing face on even the "permanent" exhibits.

The overall aim of the experiment is to align the academy with its new role in society. No longer dusty 19th century cabinets of curiosities, natural history museums deal head-on with some of the most pressing issues of the 21st century, such as global biodiversity, conservation, and the public understanding of science, says Kociolek, an expert on diatoms. Natural history museums everywhere are evolving in similar ways. But many are constrained by the limitations of old facilities, whereas a crop of brand-new museums lack the collections and research depth of the great old institutions. With its 150-year history and 18-million-specimen collection, *and* the promise of a new building, the California Academy has the "best of both worlds," says Charles Preston, founding curator-in-charge at the new Draper Museum of Natural History in Cody, Wyoming. The academy is "a great organization with visionary leadership," says Leonard Krishtalka, director of the University of Kansas Natural History Museum and Biodiversity Research Center in Lawrence. "I have every confidence that [it] will raise the bar and set the model for the 21st century natural history museum."

Coming attraction. The new Cal Academy building is to house a planetarium, a living rainforest and coral reef, and an aquarium, says director Patrick Kociolek (*top*).

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Earthshaking beginnings

The Cal Academy's ambitious plan had humble, and uniquely Californian, beginnings. The 1989 Loma Prieta earthquake damaged several of the academy's 12 buildings, the oldest of which dates back to 1916, and in 1995 San Franciscans passed a bond measure to fund repairs. But Brown's plan to move the academy put the project on hold before it began. By the time the museum's location was secure, Kociolek was suggesting that simply retrofitting the old buildings was not enough. He got his board and staff to brainstorm about ways to modernize. "How do you take this Victorian-era concept [of the natural history museum] and make it relevant to people?" Kociolek asked. "What are the societal imperatives that a place like this can address?" As they debated ideas, Kociolek says, "we realized that the current set of buildings, no matter what we do to them, would not support this program."

After that there was no looking back. The project requires the academy to move into temporary space while the old buildings are razed and the new one built, and then back to its new permanent home, at a total cost of $370 million. In the late 1990s, California's coffers were full, San Francisco was flowing with dot-com dollars, and fundraising got off to a good start. The museum got $24 million from state and federal sources, and in 2000 it managed to parlay its popularity into the passage of a second bond measure, bringing the city's commitment to $118 million. For the rest, Kociolek first went to the museum's "close family" of wealthy supporters, from whom he has raised another $100 million to date. "We are still in the early 'quiet phase' of the capital campaign," says Kociolek, "and we already have two-thirds of the money"—putting them in a strong position to pull in the remaining $128 million from individuals and foundations.

To design the museum, the academy chose architect Renzo Piano, who created Paris's famous Pompidou Center in the 1970s and recently redesigned Berlin's Potsdamer Platz. The choice paid off: Discussions with Piano quickly yielded the idea that the academy's new home should be a "green building" embodying the latest environmentally conscious technologies. Piano's creation will be topped by a living roof—more than an acre of undulating parkland with native plants. The roof, a visitor-accessible exhibit in itself, will also house

solar panels and will collect excess rainwater to help flush toilets. The building will be naturally ventilated with thermostatically controlled windows and will use 50% less energy than a traditional building of the same size, says Kociolek.

Inside, the museum will embrace a new approach to exhibits. "Most museums have a series of very fixed halls," says academy provost Terry Gosliner. "We tried to keep the bulk of our public floor much more open in its configuration, so that you can very quickly and inexpensively modify that space to bring in a large traveling exhibition or produce your own." There will be several fixed features, the most prominent of which will be a pair of domes. One will house the planetarium, the other a three-story living rainforest exhibit, lit by skylights that will also illuminate a living Philippine coral reef located between the two domes. But even these permanent exhibits will be constantly changing, with different narrative material highlighting various aspects of the coral reef, rainforest, and aquarium, from diversity to conservation to the natural history of the species found there.

This approach reflects a general trend away from static exhibits, says Robert Sullivan, associate director for public programs at the Smithsonian's National Museum of Natural History (NMNH). "The old idea of a permanent exhibit is dead, if it was ever alive," says Sullivan. Today's museums need "a critical mass of changing exhibitions to give people reasons to come again and again."

Kociolek agrees, noting that museums constantly struggle to keep visitors returning. So he has turned to the retail trade for help: He's brought in designers of stores, including Anthropologie and Urban Outfitters, and electronics giant Sony as part of the exhibit-design team. "Retail folks [know how to] bring people back," he says. But Scott Lanyon, director of the University of Minnesota's Bell Museum of Natural History in Minneapolis, warns that asking for input from the retail world must be balanced by "giving a strong voice to the scientific staff" so that exhibit content is not compromised. "I'm really glad he is doing it and not me, so I can watch," Lanyon quips.

As for research, the building's layout will reflect the academy's values there as well. The academy has in recent years embraced multidisciplinary research, but in the academy's old quarters, research departments were in far-flung corners. In Piano's building, the research staff will be grouped together, with some space dedicated exclusively to collaborative research. The exhibits will tie into the institution's unique research strengths, says Kociolek. For example, the planetarium will complement the academy's strong life-science theme with a focus on astrobiology.

A laboratory for museum design

While designers plan the ultimate exhibits, they will be able to fine-tune their ideas during a 4-year period for experimentation in the academy's temporary home, a nondescript warehouse building south of Market Street near San Francisco's Moscone Conference center and the Yerba Buena Center for the Arts. Most of the collections and aquarium stocks, and all of the research staff, will move to the new location, which opens to the public in May. Kociolek says academy staff will use the space—which is large enough for one or two changing exhibits plus a scaled-down aquarium—as a "laboratory" for testing ideas.

The ants go marching in. Brian Fisher (right) and colleagues unload army ants, including large soldiers and small workers (*top*), for a new exhibit.

The first exhibit in the new space will be about ants, using the insects to provide "a basis for talking about the whole notion of biodiversity," says academy entomologist Brian Fisher, who uses ants as biodiversity indicators in his research in Madagascar. One goal, Fisher says, is to show visitors that "systematics and the collections it requires are central to conservation." Making this kind of connection is an important mission for natural history museums, says Krishtalka of the University of Kansas: "Our challenge is to tell the public the real stories of biological diversity and connect them to their day-to-day lives."

Indeed, another part of the ant exhibit will provide a direct connection to visitors' lives, inviting them to contribute data to a research project on ants of the Bay Area. No one has ever done a survey of Bay Area ants, Fisher says. Volunteers will collect ants, note their location, and identify the species, with the help of a naturalist resource center at the academy and information online at Fisher's "AntWeb" site (NetWatch, *Science*, 6 February 2004, p. 739). "This is not just an educational exercise," Gosliner notes, "but one that will produce meaningful data." For those interested in marine life, the academy is also involving volunteers in a survey of the benthic organisms of San Francisco Bay.

In the temporary space, academy staff will test other means of exposing visitors to the research side of the museum. "We have struggled with [how best to do] this for years," says David Kavanaugh, director of research at the academy. "I think all natural history museums have." Kavanaugh plans to experiment with a "visible laboratory" where the public can watch scientists at work. Cameras mounted on microscopes will display specimens on a public screen, "and the scientists may be miked so they can answer questions," Kavanaugh says.

Michael Novacek, provost of the American Museum of Natural History in New York City, calls that "a great idea … something that museums are doing now more, and doing it better than they used to." But it can be difficult to pull off successfully, notes Anna K. Behrensmeyer, a paleobiologist at NMNH. "We have a paleo lab … completely surrounded by glass," she says. "But we haven't been able to get enough people to man it," leaving the lab empty much of the time.

Gosliner notes that the 4 years in the temporary space will acquaint many staff members with working in front of the public. "There will be no 'behind the scenes,' " he says. "We just don't have space for it." It won't be only museum visitors who are watching; all eyes in the natural history museum community will be turned to San Francisco as the California Academy's bold new experiment unfolds. **–MARCIA BARINAGA**

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