THE TECH

YOUR GUIDE TO A NEW MUSEUM

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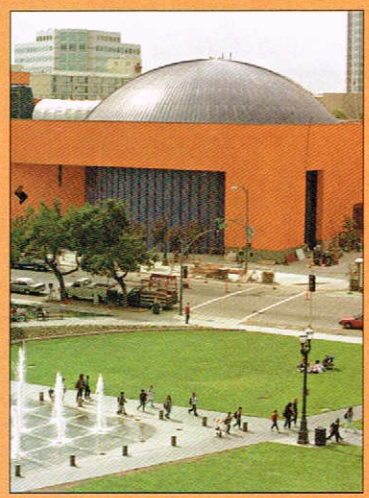
THE MANGO AND AZURE COLOR SCHEME ALREADY HAS MADE ITS IMPACT IN THE HEART OF **DOWNTOWN SAN JOSE.** NOW WE GET TO FIND OUT **WHAT'S INSIDE.**



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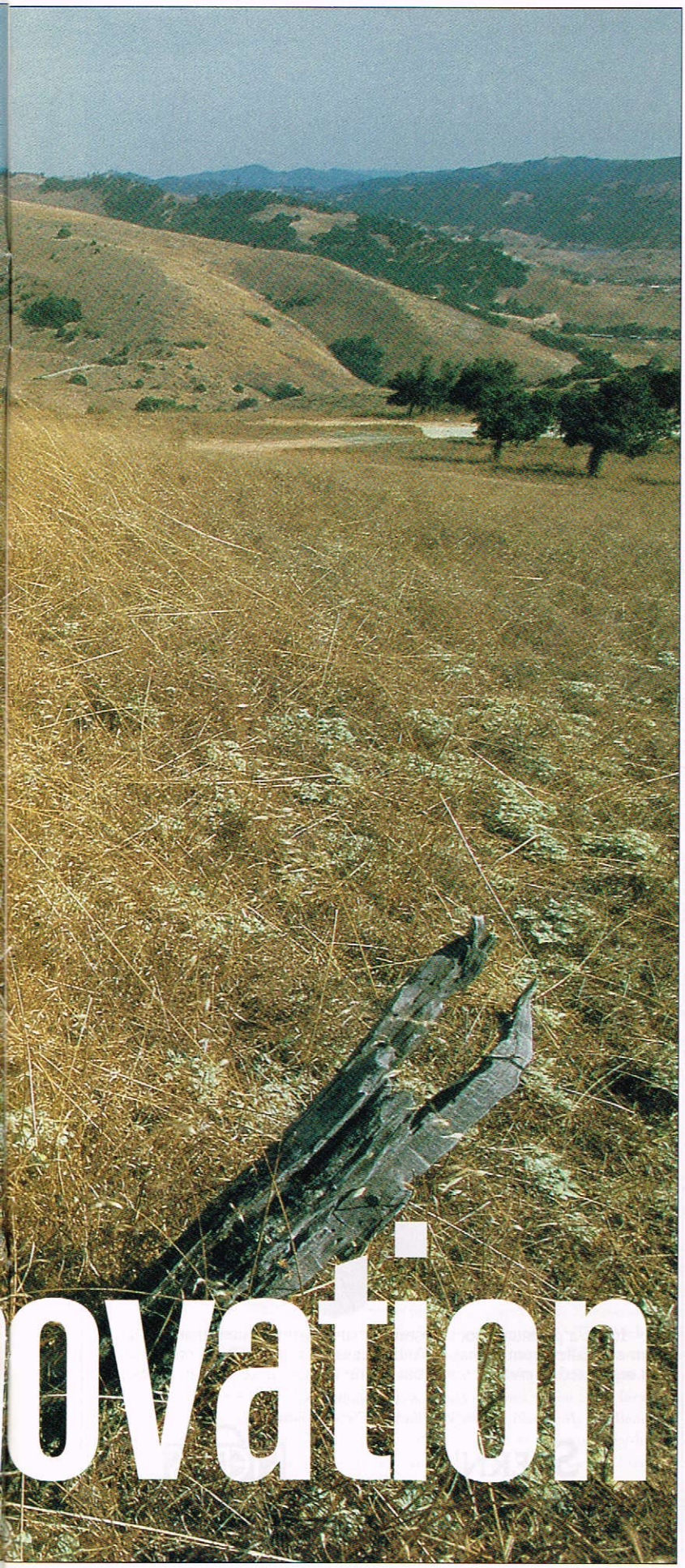

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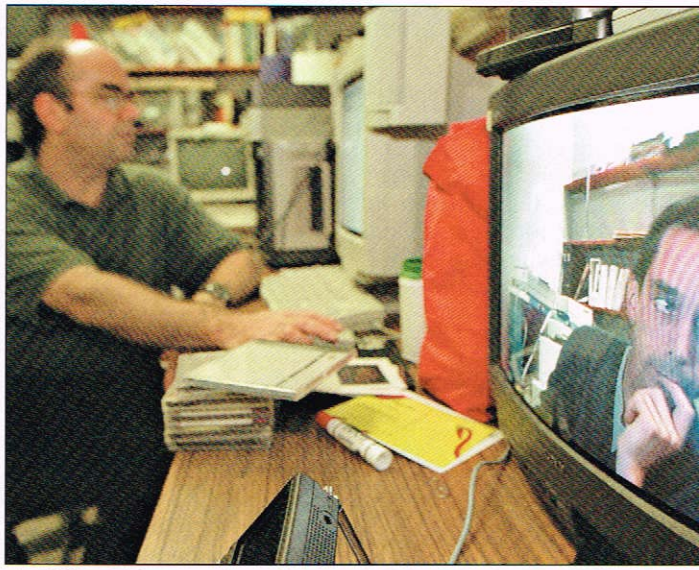

Jon Winet, left, an artist at Xerox's Palo Alto Research Center, works PARC scientist Scott Minneman, visible on a monitor. PARC gives art and scientists wide latitude to foster creativity.

In Silicon Valley, ideas are the hottest commodity

BY DEBORAH KONG
Mercury News Staff Writer

William Miller is so thoroughly entrenched in the culture Silicon Valley that even deep in the jungles of India, he found himself making instinctive comparisons between that habitat and the one back home.

The 72-year-old Miller, a Stanford University management pro sor emeritus and former CEO of the SRI International think tan was learning about efforts to save the Bengal tiger from extinct

His thoughts shifted, however, to the survival of another spec the innovator.

"Preserving the habitat is what creates the atmosphere, the en ronment, so the animals can thrive," Miller said. "The analogy is you create the right atmosphere, entrepreneurs can thrive. ... Y need certain things to sustain entrepreneurs and innovators."

Innovation permeates Silicon Valley, from the ubiquitous offic parks to the universities that seed them with fertile minds. Ope Saturday in downtown San Jose, the Tech Museum of Innovatio itself will be a living laboratory that captures the valley's traden characteristic.

Defining innovation — the introduction of something new — i easy. Finding the formula for fostering it in the valley is more d cult. What works for one company doesn't automatically transfe another.

But spend time talking to some of the valley's prominent inno tors — researchers at IBM's Almaden Research Center in South Jose, Xerox Corp.'s Palo Alto Research Center, Hewlett-Packard

PLEASE SEE INNOVATION NE

Ted Selker works on a solar-powered ThinkPad in the hills above IBM Almaden Research Center in South San Jose. Selker invented the TrackPoint, the pointer used instead of a mouse in IBM's ThinkPads. I employees can retreat to the 600-acre, company-owned property to g away from the office and the laboratory.

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Co., and Genentech Inc. — and general patterns begin to emerge.

Innovation is collaborative. It involves risks — and failure. It is fiercely competitive. And it is changing, with a sharper focus on bringing ideas into the marketplace.

COLLABORATION

Innovation isn't a solo act.

"The notion of the lone inventor working in a basement dreaming up stuff, I don't think you can actually find much evidence that's been successful," said Stanford University organizational behavior Professor Robert Sutton, who observes how people think and act at work.

Encouraging interaction among employees is built into the very architecture of many valley companies. At HP everyone — including CEO Lew Platt — works in offices without doors. At IBM's Almaden Research Center, conversation corners are equipped with whiteboards for jotting down equations and telescopes for scanning the hillside.

Ted Selker, who heads an IBM research team that works to make computers easier

Collaboration has brought together odd bedfellows

to use, spends $400 a month on popcorn, peanuts, soda, Hershey bars and other snacks. The nosh helps create an "interactive atmosphere" where researchers can casually exchange ideas, he said.

That kind of collaboration spawned the team's cutting edge SUITOR (Simple User Interest Tracker) project. Specialists in four areas — ergonomics, eye tracking, user interface and cognitive science — combined their distinctive skills.

The project allows a computer to watch the people using it. It gauges if users are interested in a topic by the length of time the eyes linger on a subject on the screen. If they gaze at a subject long enough, the computer retrieves and displays related information. The effect is unnerving — as if the computer is reading your mind.

For example, on a recent day, UC-Santa Cruz doctoral student Chris Campbell watched a ticker tape scrolling news stories across the bottom of a computer screen. When Campbell gazed at an item about American victims in the bombing a U.S. Embassy in Kenya, the screen switched to a full story on the topic.

Collaboration has brought together odd bedfellows — scientists and Bay Area artists — at Xerox's Palo Alto Research Center. As part of the program, artists receive an office and stipend — and do even have to worry about developing ne year's products.

PARC officials "are in some ways betti some of their resources that art plus tec nology can produce interesting and imp tant work," said Jon Winet, a photograp er in the program. "By introducing artis to the culture of Xerox PARC they're he ing to make it a more creative place."

The offspring of one of those pairings will be on view at the San Francisco Art Institute through November. Called the Eliza Project-Phase One, the virtual psy chotherapy session is based on a 30-yea old artificial intelligence program.

The exhibit consists of a computer wit a keyboard, a couch and some book-

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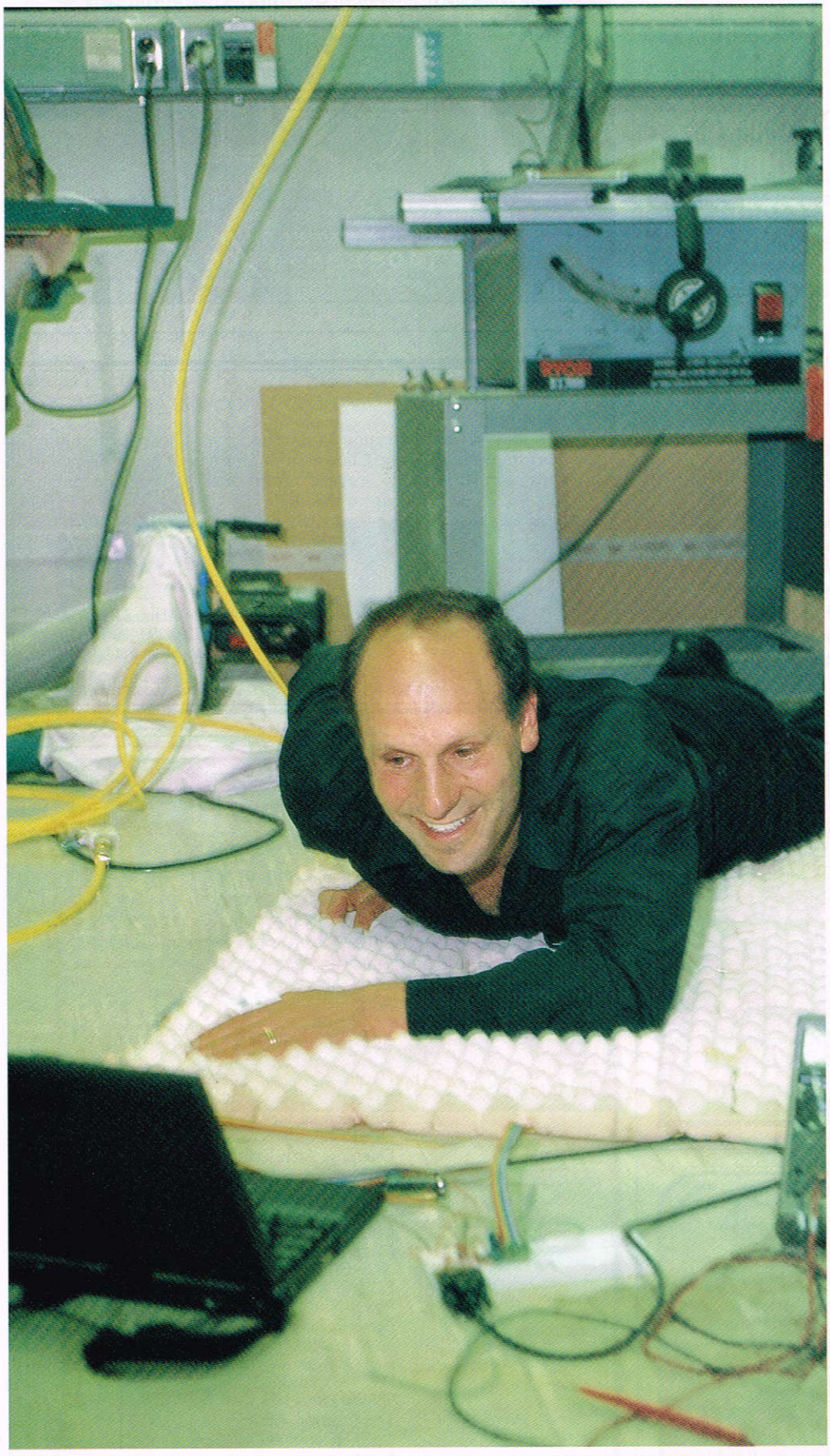

IBM researcher Ted Selker tests a product in his laboratory at the IBM Almaden Research Center in South San Jose. Selker said he lets ideas compete against one another in his mind as he develops research projects.

Cultivating innovation

INNOVATION FROM PA

shelves. The computer begins by asking a question, such as "How are you feeling?"

When the "patient" responds by typing " am sad," the computer displays an image, example, of an empty room with two chai "Why are you sad?" the computer continu drawing the patient out with a series of questions.

The artists, Winet and Margaret Crane, selected the images from photos Winet ha taken over the last 20 years. PARC scienti Dale McDonald wrote the programming code.

"We're all on fairly long leashes," said PA scientist Scott Minneman, who is teamed with Winet and two others. "Sometimes th leashes get hopelessly tangled. Sometime they get braided into something better th any one individual could have done."

TAKING RISKS

At Genentech Inc., one of biotech's first innovators, there is a company tradition. good luck, researchers place pennies in a mug that's part of a bronze statue of the company's founders. On a recent day, the cup was overflowing and the men depicte — curly haired Herb Boyer and a tie-wea Bob Swanson — wore a quarter atop thei heads.

At a company where only one of four dr in development is approved by the Food a Drug Administration, scientists aren't abo wishing for a bit of good fortune. You nee that in a business in which most drugs fai because they have too many side effects, ineffective or will not be commercially su cessful.

"It's very serendipitous," said Genentech chief operating officer, Bill Young. "You ru into roadblocks and figure out how to get around them and solve them and continu on, sometimes in a direction you don't an pate."

Failure isn't frowned upon in Silicon Val Instead, it's seen as essential to innovatio

"The kind of openness to experimentati and trying new things . . . being prepared fail and learning from the failure is critica

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innovation and inventions," said James Gibbons, Stanford's former engineering dean, now the university president's special counsel for industry relations.

A failed first try spurred Genentech researchers developing Herceptin, a treatment for advanced breast cancer. The treatment, based on a specially engineered version of the antibodies each person produces to fight diseases, would be rejected by humans because it was created from mice.

So researchers adopted a new approach, developing a technique that would trick the human body into accepting the antibodies.

The lesson? Innovation is a combination of perseverance and, sometimes, pennies in a cup.

COMPETITION

Attached to an industry newsletter on quantum physics at HP's Palo Alto labs is a Post-it note with a simple message: "The competition: 45 nm."

The note was posted by Ted Kamins, a member of a team that is researching behavior of particles at microscopic levels — the nanometer — to learn how future devices could be built at molecular levels. His note was a challenge to his team to reach an extreme goal in their research. It's part of the race to improve computer chip performance by packing as many transistors as possible onto their surfaces.

Whether it comes from an industry competitor or a friendly rivalry among co-workers, innovation feeds on competition.

Chief technologist Mark Weiser said PARC sometimes sets up multiple teams that work on different approaches to the same project.

"When they're happening, people can be very intense about who's going to win, who's going to lose," Weiser said. "It's good to get some of these passions flowing. People do the best work when they are excited, when they're going to show up their colleagues."

But scientists aren't penalized for failing to win, he added. Rather, they're rewarded by getting to choose their next project.

The past year, PARC researchers have been working on solving a basic office problem: how to integrate information kept in paper documents with information in the computer. The software project aims to track them in a common database.

Three teams use different programming languages, Java, C++ and Python, to create the database.

"You do hear conversation around coffeepots, people arguing about their different choices," Weiser said. "In the end they'll pull (their work) out and say, 'See, look what we did last week.' "

IBM's Selker, who invented the TrackPoint — the red, eraser-shaped pointer used instead of a mouse in IBM's ThinkPads — finds he's at his most creative when competing against a familiar adversary: himself.

"I have in my mind a goal, a dream of what it will feel like," said Selker, sitting in an office filled with disembodied laptop parts, a blender, an Indiana Jones-style hat and sundry wires. "What happens when I work alone, is that I am building two prototypes, two best ideas. The ideas are competing against themselves. I can build one faster by building two."

THE PRODUCT

For a glimpse into how innovation has changed, said PARC's Weiser, ask recent graduates in science or engineering who they see as their heroes.

Twenty years ago, you'd hear about Einstein, Faraday or some other "famous geeky scientist," he said.

"These days, as often as not, you find Bill Gates is who they want to be like," Weiser said. "They have a very active awareness of th value of their ideas."

It wasn't always that way at Xerox. Among PARC's legacies: the Alto, the first personal computer with a mouse and visual icons instead of commands, the first to use Ethernet technology to connect computers on local area networks.

But Xerox failed to see the value of its own ideas. And others — notably Apple Computer Inc. — commercialized PARC's inventions.

> "(Companies) can't waste a lot of time thinking about it. We've just got to do it."

Today, the prevailing attitude at PARC and othe Silicon Valley companies is that innovation isn't just about inventions anymore. It's about turning those ideas into something tangible.

Weiser encourages his researchers to seek what he calls the shiny, new, unexplored beaches of innovation — places where ideas won't show up o store shelves for a decade or more. "Whatever ha pens in the future, Xerox can get an advantage in that PARC scientists have been there," he said.

But there are also daily reminders of the bottom line, such as the fountain in one of PARC's hallways: The amount of water it spouts correlates with the company's stock price.

One hilltop over from PARC at HP's Palo Alto Laboratories, researcher Lisa Buckman said she's excited about the prospect o seeing her project turn into a product.

Buckman meets weekly with the company's product division, ar she's traveled to a Las Vegas trade show to demonstrate somethi called SpectraLAN. The technology increases the capacity and speed of local area networks that connect computers in offices by quadrupling a cable's capacity. A prototype will probably be deve oped in two years.

Such close contact with the business arm of the company is one of the effects of a product cycle that is churning faster and faster

After a recent talk Buckman gave at Stanford, the first question was about the technical specifications of her project.

The second question? " 'When can we buy it and how much wil it cost?' " Buckman recalled. "(Companies) can't waste a lot of time thinking about it. We've just got to do it."

The spirit of innovation, celebrated at the new Tech Museum, is almost genetic in Silicon Valley, said Claudia Munce, who helps market ideas that emerge from IBM Almaden's labs. As evidence, she tells a story about her daughter, Danielle, 8, who recently offered an alternative ending to "Sphere," a science-fiction movie they rented and watched together.

Danielle suggested a more optimistic finish. "I thought it was a really good idea," Munce said.

Replied her daughter: "Yeah, maybe I should patent that, Mom."