strategic relationships and set a long-term agenda. "Spindler is much more focused on the here and now."

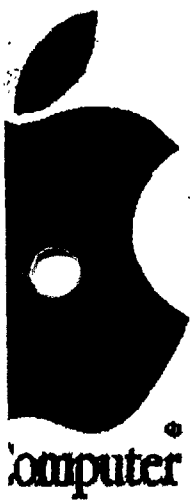
Sculley "was the Lee Iacocca of computers," adds John Donovan, a senior analyst with WorkGroup Technologies, a [illegible]pton, N.H., market research firm. "That's going to be a hard act to follow."

Sculley will remain as board chairman, and is expected to continue to forge alliances for the company.

"Spindler's first moves ... are the right ones," Mr. Donovan says. The price cuts have helped put the Cupertino, Calif., company's products in the same ballpark with other personal computers in a "ruthless commodity environment," he says. "A lot of companies are going to come out of the PC business this year," he predicts.

Lupatkin adds that Apple must consolidate its product line, which currently includes a number of similar products under different names, confusing customers.

But in this fast-changing industry, pricing and streamlining maneuvers alone will not be enough. Apple must make good on its research efforts and forge successful alliances to share investment risks with other companies as it seeks to open new markets.



One test that Lupatkin describes as "critical" will be the new operating-system software Apple is developing with IBM in a joint venture called Taligent. If successful, the software could help both Apple and IBM regain ground against Microsoft Corporation, the Redmond, Wash., company that now supplies the operating systems for most personal computers.

With its Windows software, Microsoft "closed the gap" with Apple by mimicking a key to Apple's appeal: the simple graphic format in which users perform tasks with a hand-held electronic "mouse." The Taligent software could reopen that gap.

The Newton represents another key strategy, but Lupatkin says this is a longer-term effort, because there is as yet no mass market for wireless communications. Apple is eyeing other potentially rich markets such as interactive television and speech-recognition software. But so are many other companies including Microsoft and IBM. Apple will need allies in industries such as entertainment and consumer electr[illegible]s. "The challenge for Apple is to find breakthroughs," Donovan says. "When they've won big it's been through a technology breakthrough."

The Powerbook is the latest example, winning fans with design features that make it comfortable to use.

BOSTON

THE term "competitive intelligence" conjures up images of cloak-and-dagger industrial espionage. In reality, it merely means investigating the competition.

Of course, business people have always scouted their competitors. But now experts in the field are trying to make it a recognized management specialty. Because businesses have lost global market share to German and Japanese companies, competitive intelligence skills have become sought after in the past decade, says Gerald Miller, at the School of Information Science at Simmons College in Boston.

Investigators use above-board techniques in researching competitor companies, says Jennifer Swanson, a member of the Society of Competitive Intelligence Professionals. The organization has 18 chapters nationwide. Its membership has grown about 8 percent a year in the last three years, says William Deal, the executive director. He an-

[illegible] to come to an awareness that they're not king of the hill," Mr. Miller says. Competitive intelligence professionals assess outside threats and opportunities, including environmental, technical, and governmental developments and changing consumer tastes.

Jan Herring, vice president of The Futures Group, a market forecasting firm in Washington, says that companies are setting up competitive intelligence departments. "It's like 30 years ago, when companies were setting up market research," he says.

Competitive intelligence experts are useful to the decisionmakers in a corporation, Miller adds. In a 1990 survey, competitive intelligence professionals responded that they most often reported to corporate planning groups, marketing departments, and research divisions.

"Competitive intelligence is understanding strategy and the strategic intent of the competition," says Richard Buchanan, at Digital Equipment Corporation in Maynard, Mass. "Competitors increasingly try to fill niches and ... note what competitors are doing."

How Household Hazardous Waste Is Turned Into a Fresh Coat of Paint

By Simson L. Garfinkel
Special to The Christian Science Monitor

BOSTON

HALF-EMPTY cans of old paint account for more than 50 percent of the hazardous waste in American homes.

In New England alone, an estimated 14 million gallons of the toxic material sits in basements and garages. Much of it finds its way into landfills or gets dumped.

One company trying to profit from the mess is The Green Paint Company, a year-old start-up in Sutton, Mass., whose plan is to collect used paint, recycle it into new paint, and sell it back to consumers and contractors.

It is a market-based solution to the problem of hazardous waste disposal, says Steve Greenberg, the company's vice president. But "I can't sell recycled paint unless I get the [old] paint out of your basement."

Only a handful of companies and cities around the country have tried paint recycling, says Barry Connell, a research associate with Dana Ducksbury & Associates, an environmental consulting firm in Andover, Mass. Most of the companies have simply blended the paint into an ugly gray. But by carefully sorting its paint, Green Paint is able to offer more than 12 colors.

"Green Paint is unique in that they are not just looking for giveaways to housing authorities and departments of public works," Mr. Connell says. "They're actually trying to market their paints through commercial painters and through some hardware stores directly to the consumer."

Green Paint's line of 24 products are made from between 15 and 90 percent recycled paint. The paint is collected on special "hazardous waste cleanup" days held by cities and towns. Municipalities contract with Green Paint to take the paint away.

Green Paint is currently negotiating with a company to collect used paint on a nationwide basis, Greenberg says.

Towns save money by sending paint to Green Paint's plant, which costs less than sending it to a hazardous waste disposal site. Last May, for example, the town of Attleboro, Mass., paid Green Paint $3,500 to collect 1,400 gallons of used paint. The town saved $6,000.

Green Paint's proprietary process involves a careful sorting, testing for contaminants, and reformulating the resulting paint so that it once again meets industry standards, says company president Scott Herbert, who has 20 years experience in the paint business.

Recycled paint ends up costing consumers between one-third and 40 percent less than virgin paint, Greenberg says. The paint is being sold by dealers in five states.

Funding for the company came from two Small Business Administration loans totaling $250,000. "We project that by the end of the year we will sell in the vicinity of $350,000, or 50,000 gallons," Greenberg says. He says he expects sales to rise to $5 million within two years.

CSM July 20, 1993

BBH EXHIBITS INC

model, learn that bats actually have nothing to do with Dracula fables.

ir faces, eating figs, or catch-
he wing.
: also addresses the myths
tions that have plagued bat-
s. One of the worst is the
Out of a thousand species,
ı vampire.
the one true vampire that
od of horses and cows, peo-
ıts are vampires," Tyburec
says. "But the vampires'
range is very restricted –
[it's] strictly a Latin Amer-
ican vampire. There are
none near the United
States – or Transylvania,
for that matter. Man has
introduced domesticated
cattle and horses to the
vampires' rain-forest terri-
tory, which has allowed
[the bats] to increase to
artificially high numbers.
We realize they need to be
controlled – but only vam-
pires.
vith a lot of vampire control
t species specific," Tyburec
most of these bats roost in
ink they can just burn down
rtun hundreds of other
anc ar-eating bats also

43 species of bats, of which
r are listed as endangered or
for that classification, Tybu-
f that has to do with loss of
Many of these bats roost in old-growth forests. As the forests are cut down, the bats lose their habitat.

"Other bats are very vulnerable when they hibernate or roost in maternity colonies in large caves," Tyburec says. "When a bat hibernates it tries to store up all the fat it can during the summer so it can live off that fat during the winter time. They go into a state we call torpor – circulation, breathing, and heartbeat slow down, which allows them to sleep through the winter. Now, when cavers come into the cave and wake them up they expend a lot of energy raising their metabolism back up to become active again." Bats can starve to death if they awaken too often.

Cavers may not know they are doing anything to hurt the bats, Tyburec points out. The same thing can happen to flightless young. If they perceive a threat from a caver, they will crawl around on the ceiling trying to get away from the predator. If they fall to the ground, they will be eaten by any number of animals on the floor of the cave. If that happens too often, there are no babies that year and no population growth.

But already in the BCI's 10-year history, preservation strides have been made. Many known hibernacula and maternity colonies for endangered gray bats and Indiana bats have been protected in the US. The BCI is working with several nature-conservancy groups and government agencies to track and study US bat populations.

■ *'Masters of the Night' will be on display next at the Natural History Museum of Los Angeles County, Oct. 9 through Jan. 16, 1994.*

BOOKS

People Who Put Magellan Into Orbit Around Venus

By Simson L. Garfinkel

CIRCLING, circling, circling, Magellan spins around the evening star. Scanning the Venusian surface and sending a detailed map back to Earth, in three short years this spacecraft has broadened our understanding of both planets.

In "The Evening Star: Venus Observed," Henry Cooper offers a unique perspective on the Magellan program, seen through the lives of the engineers and scientists working on it.

As the book opens, Magellan is preparing to enter orbit around the second planet. It's a simple, but critical, maneuver. Magellan must fire its main rocket at the precise moment to slow itself down, then jettison its main rocket. If everything doesn't go precisely as planned, the spacecraft will keep going toward the sun and will not return to Venus for 100 years.

The engineers are confident, but anxious. Magellan, after all, was built from parts left over from other missions. Parts of the spacecraft are falling apart. The rocket itself was originally miswired; all would have been lost if an engineer had not woken up in a cold sweat realizing that he had done something wrong.

Cooper plays these moments for all they are worth, sharing the engineers' suspense, fears, and finally their exhilaration with the reader.

It takes a lot of people to run a space mission, and it seems that Cooper is friends with them all. He tells the reader who likes what hobbies, who was whose graduate student, the topics of scientists' undergraduate and doctoral theses, and which are the most important and interesting labs around the country.

Backing up these lives is Cooper's sense of space-exploration history, the result of covering space for 25 years for The New Yorker magazine. The richness and depth of the story makes the reader one of the gang.

Like many news accounts, the bulk of "The Evening Star" is devoted to the science of the Magellan project: discovering exactly what is on Venus and trying to come up with plausible theories to explain the observations. Venus, as Cooper explains, is an interesting place, requiring a whole host of new theories.

Dark spots are scattered on the ground, which one scientist deduces are "slaps," the remnants of shock waves from meteors that burned up in the thick Venusian atmosphere. (The findings from Venus have helped explain the 1906 Tunguska Event in northern Siberia, when trees were flattened for a 50-mile radius.)

In other places, Magellan discovers 20-mile wide "pancakes." A bright graduate student proclaims that they are lava that bubbled up to the surface and then spread out, like batter on a hot griddle.

But unlike accounts of discoveries in the newspapers, "The Evening Star" describes the theories as they are under development. One aspect of science that most nonscientists do not understand is just how subject to change scientific thought actually is. Theories keep changing as new data are sent back and reanalyzed. Cooper shows how some scientists hold onto their theories, even when all of their colleagues have changed their minds, sometimes correctly, sometimes incorrectly.

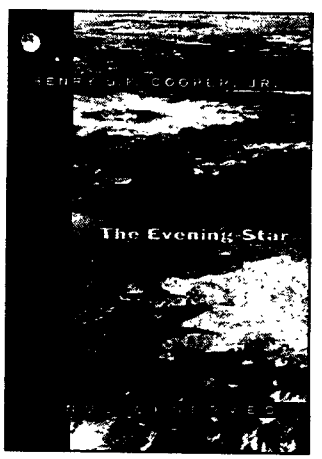
The fluidity of the process leads Cooper to conclude that: "Science is not an art – though some may feel it resembles art in certain respects. Science may not even be a science. What it most likely is, is a very human process for arriving at the closest approximation to the truth – as elusive an ideal, perhaps, as the last dance."

The Magellan spacecraft is still going strong, yet its fruitful mission may soon be at an end. Having weathered the dangers of space, Magellan has lost its funding battle in Washington.

With limited funds and other spacecraft to fly, it now seems that the National Aeronautics and Space Administration will shut down Magellan before the end of its useful life – the first time NASA has ever shut down a working spacecraft. It won't be a tragedy, but it will be a shame for the men and women of the Magellan project – people whom the reader has come to care for quite a bit by the end of Cooper's remarkable volume.

■ *Simson L. Garfinkel is a freelance writer who specializes in science and technology.*

THE EVENING STAR: VENUS OBSERVED
By Henry S. F. Cooper Jr.
Farrar Straus Giroux
274 pp., $22



Henry Cooper offers a unique perspective on the Magellan program, seen through the lives of the engineers and scientists working on it.