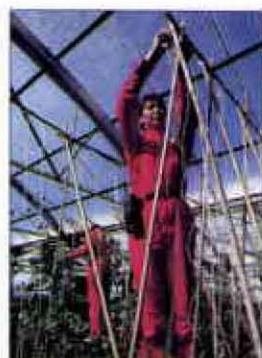# MEASURE

Biosphere II:
Living inside
a terrarium
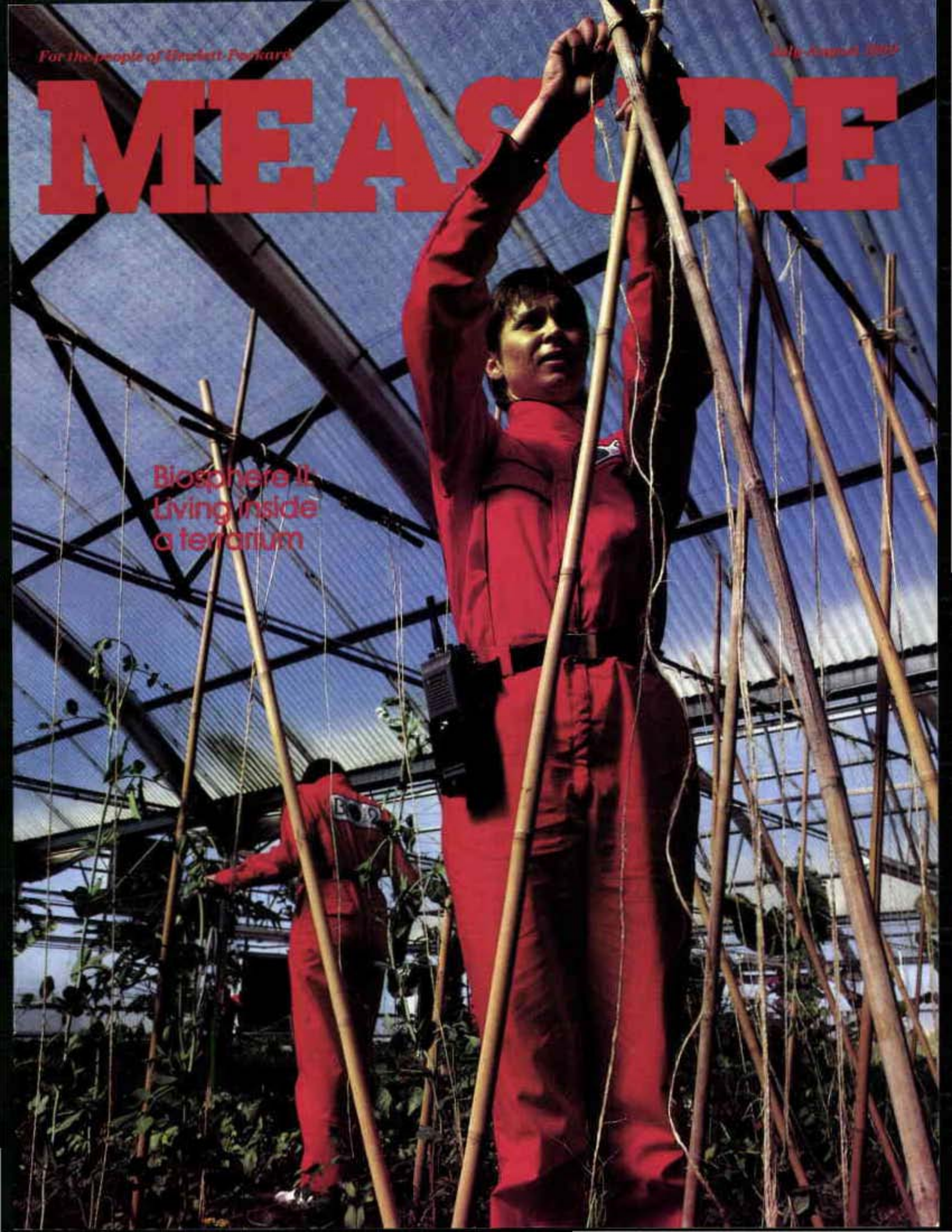
THE INSIDE STORIES

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**On the cover:
Researchers inside
Biosphere II (see story on
page 14) prepare crops
for their two-year stay in
the sealed scientific
experiment. HP is
providing the "nerve
system" for the structure.
Photo by Peter Menzel.**

FEATURES

DEPARTMENTS

MEASURE

At CONDUMEX in Mexico City, plant manager Javier Mendoza talks with HP Mexico's Enrique Perezyera.

Turning the corner in Latin America

By Betty Gerard

If the 1980s were the "Lost Decade" for Latin America, 1990 marks a decided turnaround.

While changes in other parts of the world have been grabbing headlines, Latin America has undergone a transformation. From Mexico to the tip of Argentina, democratically elected leaders are receptive to more open-trade policies. Crushing debt still hobbles many countries, but real hope exists for a solution.

Manuel Diaz, managing director of Intercontinental Operations' Latin American Region, has led the HP charge in this volatile but highly promising market. Combined order growth for the past two years was 61 percent—even using new accounting rules that understated some numbers.

As Manuel told his troops enthusiastically, "Not bad!" Their admiring nickname for him is *El Commandante*.

Manuel has headed the Latin American Region since 1986 when Intercon moved the region headquarters from Palo Alto,

Latin America

California, to Mexico City. His replacement as general manager of HP's Mexican sales subsidiary is Rafael Piccolo. Both are former top executives with IBM in Mexico, with wide connections in the country's business circles. They share the same positive approach to the selling process. "I love to take risks," Manuel says. "I love to compete," Rafael smiles.

The small region-management team—small, because the emphasis is on active selling—and HP Mexico's

> *"You must live within this environment to understand what's happening ..."*

sales headquarters share a modern nine-floor building in the Lomas district.

Having the region's nerve center in Latin America is critical, Manuel believes. "You must live within this environment to understand what's happening and to react quickly," he says. "You have to expect anything—and that no matter how bad it is, it will get better."

Munir Dabaghi, region sales and marketing manager, is one of the experienced HP Mexico managers who transferred to the region team. "We're not as easily distressed by currency devaluation or political and economic change," he says. "The local managers of multinational subsidiaries have come to know us. We speak their language and know this environment."

Today Mexico is the standout success story of the region, with a superb record of sales in both computer systems and personal computers. In the past two years, total sales in the coun-

try have nearly doubled. In computers, HP is now in a solid No. 2 position behind IBM.

Brazil continues to hold enormous market potential, although non-Brazilian-owned companies are legally excluded from investing in the country's computer industry. Hewlett-Packard and the Iochpe Group in Brazil have an innovative agreement that allows HP to invest $13 million indirectly (through debentures in a third company) in Iochpe-controlled Edisa Informatica.

HP no longer sells or manufactures directly in Brazil. Calculators formerly made by HP in Campinas now are produced by Edisa, and selected HP technology is being transferred. This June, Edisa completed the pilot run for production of a high-capacity 5¼-inch disk mechanism. On the sales side, HP will share in profits, also indirectly.

The Latin American Region also contains HP subsidiaries in Venezuela (established in 1967) and Argentina

(1968). While the economies of both countries have stalled during the past decade, new initiatives are stirring.

In Venezuela, President Carlos Andres Perez has launched an economic program to abolish years of exchange and import controls. Rich oil reserves and minerals offer raw materials for industrialization. Under General Manager Airton Gimenes, HP Venezuela has installed the most Laboratory Automation Systems in Latin America, and landed an order for 1,900 HP Vectra personal computers from the government-owned oil corporation.

Rui da Costa, general manager of HP Argentina, says simply, "In a country with very little money, you concentrate on where the money is."

That means focusing on export-oriented companies, such as the food industry; oil and petrochemical businesses, which are both dollar-denominated; and projects backed by the World Bank or InterAmerican Develop-

Customer engineer Jose Leon concentrates on a repair job in the service-bench department of HP Venezuela's headquarters office in Caracas, the country's capital.

ment Bank to make government more effective. HP recently sold eight HP 9000 Series 800 systems and 70 HP Vectra PCs to the Institute for Agricultural Studies to gather statistics on crops, cattle and fishing.

Countries where HP has no subsidiary have their own umbrella of management support.

Mexico may well be the model for future HP success stories throughout the region. The key elements:

■ **Commitment from the top.** HP President and CEO John Young gave strong backing to "going for it" in Mexico. When HP needed a manufacturing presence to sell computers, it invested

> *Mexico is the standout success story of the region.*

in a factory in Guadalajara in 1982 (see story on page 6). In 1986 John met in Mexico with then-President Miguel de la Madrid, who reversed the government's protectionist policy which sheltered Mexican industry. This February John called on President Carlos Salinas Gotari, who has further opened the borders to competition.

■ **Vision.** "Eight years ago, Manuel Diaz saw the needs of the Mexican marketplace in the 1980s and '90s," says Salvador Quirarte, who manages HP Mexico's sales to all major manufacturers in the country. He also oversees sales to the *maquiladoras*— primarily U.S.- and Japanese-owned plants that operate on the Mexican

The Miami gateway

Why does HP's Latin American Region have an office in Miami, Florida?

Miami serves as an hospitable gateway to the U.S. for Latin America. To countries in Central America, the Caribbean and as far south as Equador and Chile, it is three hours away by air. At least five flights a day go in and out of the busy Miami airport to every country where HP does business in the region.

A non-subsidiary country (NSC, in HP shorthand) organization is headed by Jorge Martinez, region business development manager. NSC works with the 27 distributors who handle HP products in Colombia, Chile, Peru, Trinidad-Tobago, Guatemala and 13 other countries.

"Miami is the natural location for our sales support for distributors," says Augusto Cabana, who manages the bilingual office. "This is a major

shopping area for Latin America, with many visitors having bank accounts and vacation homes here."

In less than three years, the original handful of technical-support people has grown to a 23-person office that handles all NSC order processing, inventory and traffic— including shipping all orders to distributors and directly to customers.

Miami is the consolidation point for orders going to Latin America via the huge warehouse facilities of Kuhnel & Nagel, a major forwarder.

This fall the Miami office will move from its temporary quarters near the airport to a more typical HP facility—just in time to welcome the region's workstation marketing and sales team, moving down from Atlanta, Georgia.

The convenient Miami connection paid off with 80 percent growth in orders for NSC last year.

side of the U.S.-Mexico border in a zone exempt from U.S. import duty.

"Manuel realized that Mexican industry must have high productivity, high quality and low-cost products to survive in the global marketplace," Salvador says. "No one would have believed it then."

HP Mexico's early strategy of helping the country's business competitiveness fits neatly with the new government direction. Mexico is exploring a trade pact with the U.S. that would further tie the two economies, and there's talk of an emerging North American common market that would include Mexico.

Munir Dabaghi, sales and marketing manager, and Guillermo Castro, marketing manager, discuss region strategy.

■ **Analyze your market.** Jaime Carpenter, sales manager for HP Mexico, points out many companies are family-owned, with a penchant for privacy. They are not used to paying for consulting and software assistance beyond the warranty period. HP Mexico bundles the cost of such services into the price of computer systems, making it very clear what to expect.

Attitude is also important, Jaime says. "Some of our sales reps are hound dogs—they can smell sales opportunities. And they have no trouble getting in to see the CEO of any company."

■ **Digging in.** When many U.S. companies abandoned Mexico due to its economic problems, HP Mexico hired top people to consult with manufacturers and help develop their operations. Sales reps learned the problems and

> *"This is a very special case of marriage between a sales team and the factory."*

special language of manufacturing to match software from the Manufacturing Productivity Division to customer needs. HP Mexico translates software into Spanish in the Lomas office and shares it throughout the region.

Enrique Perezyera (who made the President's Club for HP's top sales reps
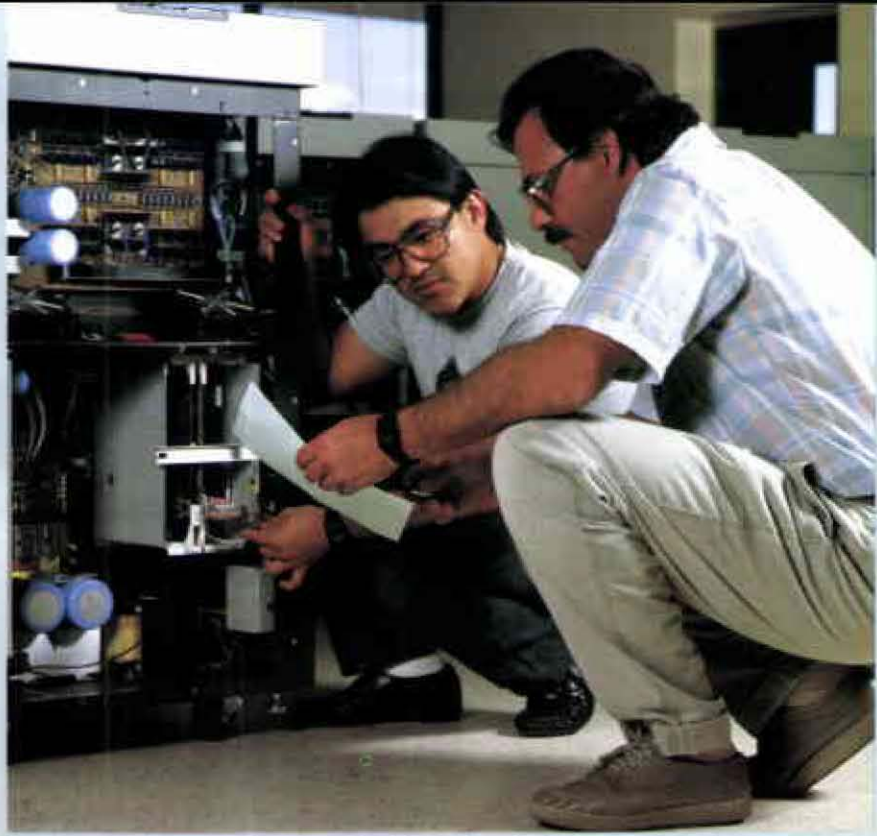
To prepare for the transfer of impact printers, Hugo Cisneros and Pepe Chavolla from the Guadalajara Computer Operation worked for months at HP in Boise, Idaho.

Go for it

It's not surprising that the recent transfer of impact printers from the Boise (Idaho) Printer Division to the Guadalajara Computer Operation (GCO) went by the book.

The book, in this case, is HP's detailed "Product Transfer Life Cycle" manual: the standard procedure throughout the company for starting new manufacturing operations and transferring products between factories. Jaime Reyes, GCO manufacturing manager, headed the task force that wrote it in 1987.

GCO is an old hand at transfers. It has handled from seven to eight product transfers a year since its startup in 1982—building computers, floppy and Winchester disks, cartridge tapes and printers. GCO has an enviable record for total quality control and top-notch people. (The R&D department now designs and tests state-of-the-art memory boards for other entities.)

But the transfer of the impact

printers is the largest ever. It also is the first time that GCO has been given the worldwide technical-marketing function.

Says GCO Operations Manager Mike Forster, "This is the most highly vested transfer I've seen." Some 20 Guadalajara employees spent from three to six months in Boise, filling in openings that occurred.

At either end of the transfer, Bryce Jeppsen in Boise and Jerry Hild in Guadalajara served as the product-transfer managers. They began the transfer in November 1989. By the end of this October, all HP impact printers will be shipped from the Mexican facility.

To keep the communication lines open, a team of Boise and Guadalajara employees met every six weeks, alternating between the sites. They called themselves *Chamos*—roughly translated, "Go for it."

in the world) has developed accounts like MABE, the largest gas-range manufacturer in the world, and CONDU-MEX, a large cable manufacturer.

His technique is to first identify a multisite manufacturing company and then thoroughly study the operation of a flagship plant. An HP solution there becomes a convincing demo for other sites to follow.

What has proved so successful an approach in manufacturing will now be extended by HP Mexico to other industries such as tourism.

■ **The PC push.** HP always plays by the rules in Mexico—but sometimes the rules change, says Carlos Guzman, region PC manager. Microcomputadoras HP (MHP) began in 1984 as a joint venture to make PCs; this permitted HP to sell them in Mexico. Two years later HP was allowed 100 percent

> "*Mexico has the most brutally aggressive sales force I've seen.*"

ownership of MHP, and shifted PC sales to HP Mexico.

With no established sales force for PCs, HP Mexico decided to sell only through dealers and to build strong partnerships with them. A dealers' council meets every two months with HP's sales force and factory marketing. "They serve as a thermometer to make us aware of what they see and feel," says Benjamin Castro, dealer channel operations manager.

In 1989 HP had some 22 percent marketshare in PCs in Mexico, one of the highest in the company.

HP President John Young (left) and Manuel Diaz , Latin American Region managing director, greet key customers at a reception in Mexico City.

The PC sales organization and the MHP factory in Guadalajara—which shares a site with the Guadalajara Computer Operation—have unusually strong ties. MHP cheerfully makes special configurations to help close a sale, and General Manager John Toppel (a former HP sales manager himself) welcomes frequent plant visits from customers and dealers.

Muses John, "I've sold for HP in four countries, and Mexico has the most brutally aggressive sales force I've seen." Sales managers in Mexico just smile at the characterization.

"This is a very special case of marriage between a sales team and the factory," says MHP marketing manager Luis Puerto. "This factory knows who our partners are and who is the final customer. I love to help the sales force win the big deal."

Production space is compact on the MHP side of the Guadalajara facility. "When I show visitors our production line, they usually ask if that's all there is," says Jose Luis Ortega, MHP manufacturing manager.

Most of MHP's work is done and tested by local suppliers, with components then assembled on its own three fully flexible lines. Under production supervisor Ramon Diaz, these can produce any of 40 models of HP Vectra PCs or terminals interchangeably.

Products from one of MHP's suppliers, a cable company, are now sold worldwide to HP entities through the company's international procurement office on the Guadalajara site.

Can HP replicate its experience in Mexico throughout Latin America, given the highly individual nature and condition of these countries? *Commandante* Diaz is sure that it can be done—and it won't take a decade, either. ■

What if E.T. phoned home and got voice mail?

By Nancy Turner

Like the famous Extra Terrestrial, sometimes you just *have* to get a message to someone. More than 40,000 HP voice-mail "subscribers" are discovering just how useful this technology can be.

With voice mail, E.T. would have had no worries when he tried to phone home.

"I am either on my phone or away from my desk right now ..." These words are becoming almost as familiar to Hewlett-Packard employees as the ringing of their phones. Voice mail has rapidly become a common productivity tool for many employees.

It's becoming so much a part of everyday communication at HP that Tom Musolf from the Personal Computer Group in Sunnyvale, California, says, "I get frustrated when I don't get voice mail when I can't reach the person I'm calling. I find I do business much better when I can leave a detailed message instead of just my name and number."

Although some HP employees resist voice mail at first, most become comfortable with the system after getting used to it. Bob Gann from HP's Greeley (Colorado) Hardcopy Division says, "In the two or so years I have used voice mail, I have noticed that the benefits have increased as the users —non-HP employees as well as HP

employees—have become more comfortable with the technology."

What exactly is voice mail? Although most people think of it as a sophisticated answering machine, it's actually a type of electronic messaging that uses the telephone as a terminal to exchange verbal information. People can receive messages from outside callers as well as from other voice-mail "subscribers" (people with a voice mailbox). As with HP Desk, voice-mail subscribers can reply to messages sent from other subscribers and forward messages. HP uses Octel Communications' voice-mail systems throughout the company. (HP purchased 10 percent equity in Octel in 1988.)

Employees can incorporate voice mail into their everyday activities to enhance productivity. For example:

■ Holly Jacobs-Khazam, Corporate HP Desk network services manager in Palo Alto, California, uses voice mail to communicate with vendors who

don't have voice mail. Vendors call her mailbox as "guests" to hear personalized messages she leaves for them.

■ Kent Shelby from the Atlanta (Georgia) Response Center leaves voice messages for his West Coast contacts early in the morning, knowing that they will receive the messages first thing. He also programs his voice mailbox to call his pager if he receives a message after regular business hours.

■ Jeff Conte, a product marketing manager for HP 3000 media products at the Application Support Division in Mountain View, California, found it "very convenient" to access his voice messages during a recent trip to HP's Copenhagen, Denmark, office.

HP's voice-mail network enables employees to exchange voice messages between HP sites similar to the

> *One employee programs his voice mailbox to call his pager if he receives a message after regular business hours.*

HP Desk (electronic mail) network. Seventy of HP's 90 voice-mail sites are networked. Employees can send a voice message within the network by entering a co-worker's seven-digit Telnet number. Co-workers can reply to a networked message by pressing one button.

■ Don Robinson, a district service manager at Neely's Pleasanton, California, sales office, says voice mail makes it simple to reach a number of people simultaneously. He communicates with his eight staff members in
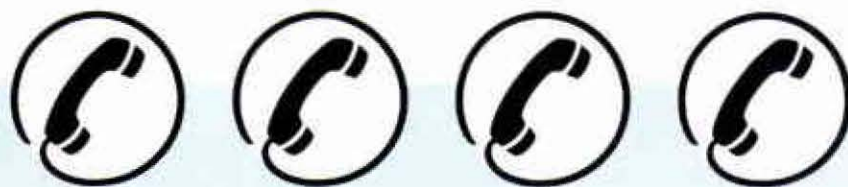
Creative voice mail

Snow hotline

In winter, HP's Englewood, Colorado, sales-office employees call a "snow hotline" to see if the office is open before they venture out into the ice and snow.

Before voice mail, employees called an office answering machine which often was busy. The snow hotline relieves this frustration because many employees can tap into the information at once.

"Spy" hotline

The Medical Products Group sales force stays a step ahead of the competition, thanks to an innovative voice-mail application at HP's Waltham, Massachusetts, site. Sales reps call to hear up-to-the-minute information about competitors so they are better prepared on customer calls. Busy sales representatives select from a menu of competitors and listen to what is pertinent to them.

Before the "spy" hotline, sales reps had to call the Waltham Marketing Center. Now the sales force can hear the information 24 hours a day, and several reps can listen at the same time.

Bilingually speaking

Due to the large number of French and English customers served by

the sales force in HP's Montreal, Canada, sales office, voice-mail greetings are recorded in French and English.

Callers calling the main voice-mail number hear French and English greetings, and may select the language they prefer by pressing a number on touch-tone phones. While the system prompts are all in French, the individual subscriber greetings are in French and English.

Go ask ALICE

Both of HP's North American Response Centers use a special voice-mail application called "ALICE" (Automated Logging of Information between Customers and Engineers).

When customers call the response centers to report problems, they can leave detailed messages in voice mailboxes that correspond to the last two digits of the service-request numbers. Response-center engineers check for voice-mail messages when they receive service requests.

Often the voice message gives the engineer enough information to begin working on the problem immediately instead of having to call the customer for more information.

Voice mail

three sales offices as easily as if they were in the same office by using the voice-mail network in conjunction with a voice-mail distribution list. Pagers alert his customer-support representatives of new voice-mail messages. The reps retrieve the messages via cellular phones.

Not all experiences with voice mail are positive, mostly due to misuse of the system (see story on this page).

Corporate Integrated Office Systems (IOS) constantly works to improve HP's voice-mail use. Employees can inform IOS of positive or negative

> ## Most voice-mailbox problems are due to misuse of the system.

experiences, or just "voice their opinions" about voice mail by calling Telnet 424-4100 (international is 1-415-424-4100). Callers receive a follow-up call if desired.

International implementation of voice mail is proceeding slowly because it's been difficult to get the required certification in some countries.

HP now has systems in the U.S., Canada, Puerto Rico, Singapore and the U.K.

Even though HP's European Operations headquarters in Geneva, Switzerland, doesn't have voice mail, Dominique Courcoux, information technology manager for Europe, believes that voice mail "has really simplified my life." He doesn't worry as much about time zones because he can

If you've ever wondered who recorded all of those electronic messages you hear on HP and other company systems, meet Jane Barbe, the "voice" behind voice mail.

leave a voice-mail message 24 hours a day for his U.S.-based colleagues. Voice mail is "one of the most promising, useful and cost-effective technologies of the future," Dominique says.

Stefan Ziemer from HP's Australian Software Operation in Ringwood, Australia, believes that "voice mail has a number of special advantages and disadvantages for international users." One of the major stumbling blocks for international use, Stefan says, is the lack of touch-tone phones in some countries, without which voice mail is virtually impossible to use.

As HP employees discover new ways to get the most from their voice mailboxes, HP's investment in voice mail sounds better and better. ∎

This is the first Measure *article by Nancy Turner, a technology specialist in Corporate Integrated Office Systems.—Editor*

Voice-mail etiquette

Subscriber

☎ Always answer your phone. Answer within three rings if you are sitting at your desk.

☎ Respond promptly. Make your best effort to return calls within 24 hours. If you are unable to do so, make this clear in your greeting.

☎ Record appropriate greetings. Give your first and last name in your greeting, as well as any other pertinent information. Record an "extended-absence greeting" if you will be gone for a day or longer.

Caller

☎ Speak clearly. Speak slowly and clearly when leaving a voice-mail message. Your message will not do any good if it's unclear.

☎ Send concise messages. Leave short but detailed messages. Send highly technical information over HP Desk.

☎ Press "0" only when urgent. Press "0" to reach an attendant in urgent situations *only*. Tying up people for routine calls may cause them to be unavailable when truly needed.

INTEREX Executive Director Chuck Piercey (left) shares system-improvement information from HP 1000 users with HP's David Fastenau.

Users friendly: HP's computer fan club

By Donna Jones

For 15 years, HP has benefited from feedback from LUGs, RUGs, TUGs and NUGs — the various entities which comprise INTEREX, HP's international users' group.

LUGs, RUGs, TUGs and NUGs. No, it's not the name of the next Steve Martin and John Candy movie. These acronyms represent a group of folks that together comprise INTEREX, HP's international users' group.

INTEREX serves the needs of a variety of people, including users of personal computers, desktops and minicomputers in both business and technical applications.

It's been said that INTEREX stands for "Interchange and Exchange of Information." This 8,000-member group is to HP what snow-covered fans are to football. They're dedicated, loyal and loud.

About 20 years ago HP tackled an enormous feat—producing business machines that processed data. With the introduction of HP's first business computer came the birth of what's grown to be HP's biggest fan club. These early users soon began sharing best practices, improving their skills and their companies' productivity.

Nineteen seventy-four marked the official beginning of the HP 1000 IUG

(International Users Group) and close on its heels, the HP 3000 IUG emerged. Like acronyms (see list on page 12), where would the computer industry be without mergers? So in 1984, the two groups "merged" to combine forces and create INTEREX.

When it comes to users' groups, INTEREX is different in that it is not-for-profit. Unlike IBM, DEC and Sun user groups, which are company-funded, HP's group stands on its own merits and fends for itself. Simply put, folks involved in INTEREX do so because they want to; they feel strongly about HP computer products.

"People join us primarily for professional development and to network with other HP users," says Chuck Piercey, INTEREX executive director.

Chuck reports to a seven-member board elected by the group's members. He believes that INTEREX is a tremendous avenue for moving information from HP's installed base—HP 1000, 3000 and 9000 customers— to HP's decision-makers.

INTEREX

Vendor booths are always popular during the INTEREX conference, including last year's 15th-anniversary event in San Francisco which attracted a record 5,345 HP computer users.

"We pull together information on what customers want, organize it and feed it back to HP," he says.

Usually vendors call the shots, but in a recent case, INTEREX members convinced HP management not only to extend the life of the HP 1000, but also make improvements to the HP 1000 family. (See related article on page 13.)

From the group's Sunnyvale, California, headquarters, 40 staff members work year-round preparing publications, software libraries, seminars, symposia and conferences for members located in 62 countries.

Two conferences are held annually in North America: the users' conference and the computing management symposium. Conferences also are held annually in Europe and bi-annually in the Pacific Rim.

In addition, the Apollo Domain Users' Society (ADUS), a 5,000-member organization of Apollo system users, holds annual conferences in North America, Europe and the Far East. Mary Allard, manager of marketing communications at HP's Apollo Systems Division, hopes that ADUS

> ## *"We pull together information on what customers want, organize it and feed it back to HP."*

and INTEREX can leverage the strengths of both organizations to benefit workstation users.

The annual conferences are perhaps the most visible and well attended of all INTEREX events.

When's the last time you threw a party, had 4,000 people say they'd be there and have 5,345 show up? This

INTEREX acronyms

LUG—Local User Group
RUG—Business (HP 3000)
Regional User Group
TUG—Technical (HP 1000/9000)
Regional User Group
NUG—National User Group
ENUG (HP 3000)—European
National User Group Council
ETC (HP 1000/9000)—European
Technical Computer User Council
SIG—Special Interest Group

was the dilemma, or, as Nancy Onskt believes, the opportunity that last year's North American conference in San Francisco presented to HP.

"Since the 1989 conference, HP has realized $3.6 million in sales from inquiries at the conference," says Nancy, manager of HP user group relations.

Nancy is HP's contact to INTEREX. She attends group board meetings, conference committee meetings and monthly HP computer division liaison meetings.

Last year's conference offered technical and management presentations, special-interest group meetings, 300

computer-vendor booths and the popular management roundtable with HP specialists.

But the most intriguing draw at the four-day event was the replica of the HP garage—which included a theater-

> ## *The most intriguing draw at the 1989 INTEREX conference was the replica of the HP garage.*

style presentation of 50 years of HP history. INTEREX celebrated its 15th anniversary in 1989.

In addition to the garage display and management roundtable, HP had a 5,000-square-foot booth, hosted the opening reception and conducted the "State-of-the-Product Line" address where HP introduced 20 new products and gave an update on existing lines.

"This one event gives HP the opportunity to market to more than 5,000 users. It's an annual one-shot deal," Nancy says.

Not only were HP's products visible, so were its executives. Welcoming the group were co-founder and Board Chairman Dave Packard and President and CEO John Young.

"INTEREX provides HP with an essential channel of communication

through which we can learn how to better serve the needs of our users," John said. "It's a win-win relationship based on shared plans and shared trust. We'll be looking to you to help decide what new technologies and new business relationships we should add in the years ahead. Customers are the architects of HP's future."

"HP can deliver key messages at these conferences," adds Chuck. "This year in Boston the message will be that NewWave Computing is here today and fits into the customer's future."

And while HP and INTEREX share many of the same visions, they also share some of the same challenges.

"In the years to come INTEREX hopes to become a truly global organization," Nancy says.

Presently there are about 3,000 non-U.S. members—almost one-third of the INTEREX population.

"As the industry changes, so do customer needs," Chuck says. "We have to

> ## "Customers are the architects of HP's future."

juggle the needs of HP's older installed base and meet the emerging needs of new customers."

What's ahead for this eager entourage of HP computer users? In August they'll all rub shoulders at the annual conference in what's been called the largest gathering of HP computing professionals outside the walls of HP itself. This year's conference, August 20–23, boasts that it will be "four days that will shake your world." Good thing it's in Boston this year. ■

Held during HP's 50th anniversary, the 1989 conference had a replica of Bill and Dave's garage—now a California historical landmark.

Round 2 for the HP 1000

With a little sweat and a lot of perseverance, INTEREX members rolled up their sleeves last year and challenged HP management to keep the HP 1000 computer system. Because of their efforts, this 21-year-old family of computers will not only survive, it will receive a revitalizing boost as well.

Don Wright, INTEREX board member and owner of Interactive Computer Technology in Lake Elmo, Minnesota, led the HP 1000 product-line campaign.

"Extending the life of the product line and introducing a new high-end processor are impressive turnarounds and attributes to HP's sensitivity to customers," Don says.

HP responded by redoubling the computer's marketing and R&D efforts, and by promising users a faster model with no changes needed to run current applications.

Some of these improvements are:
■ The new HP 1000 A-Series Model A990, which was announced at a users' group conference, will provide twice the performance of previous models.
■ A software release that enhances system performance.

■ An interface that enables HP 1000 users to take advantage of HP peripherals.

The HP 1000 family of computer systems, which can be found controlling spacecraft and monitoring Olympic drug testing, will be supported by HP through the year 2010.

HP's strategy includes meeting the needs of loyal customers and their investments in the HP 1000.

"Since information flows both ways, we all benefit from INTEREX," says David Fastenau, product marketing manager of the Data Systems Operation.

"Not only is INTEREX an effective marketing channel, it's an interested group of customers who want to help us improve our products," David adds.

"Our members were instrumental in collecting input, organizing it and presenting it to HP management," says Chuck Piercey. "In this case, we channeled the customer outcry to keep the HP 1000 computer line."

"After all," Chuck adds, "INTEREX is the user community's collective voice to HP."

Rising from the Arizona desert floor, Biosphere II is a remarkable three-acre ecological experiment.

Biosphere II: That's life (in a bottle)

By Jay Coleman

ORACLE, Arizona—This fall—if everything goes as planned—eight researchers will seal themselves into the world's largest terrarium for a two-year experiment like nothing else in the world.

It's called Biosphere II (Biosphere I being the Earth)—a closed structure about the size of three football fields.

Once the glass and space-frame structure is sealed from Earth's atmosphere, the ecological systems inside will recycle air, water and nutrients to maintain the life of the 3,800 plant and animal species living there.

Biosphere II is the creation of a company called Space Biospheres Ventures (SBV), a private ecological research firm. With $30 million in seed funding from Texas oilman and billionaire Ed Bass, SBV three years ago set out on its venture to:

■ Better understand Biosphere I;

■ Develop marketable technologies to purify and recycle water, air and nutrients; and

■ Research the potential of establishing permanent stations in space or on other planets.

So how in the world—or, in this case, in the desert 30 miles north of Tucson, Arizona—do you keep eight human beings ("biospherians"), 3,800 plant and animal species and 7 million cubic feet of life alive and functioning with little outside help for two years?

SBV's solution was to contract with Hewlett-Packard to design a network of computers, electronic sensors, and analytical and medical instruments to gather, transmit, analyze, control and store data about Biosphere II. SBV calls it the nerve system.

"That makes us the backbone that holds everything together in Biosphere II," says Roger Brathwaite, HP project manager. "In a very real sense, Biosphere II is completely alive. You have to think to yourself, 'Soil is alive.'

"It's the most interesting scientific project in the U.S. since the early days of the Apollo space program."

"HP was the ideal company for us

because it has such a wide range of instrumentation and computing capabilities," says Norberto Alvarez-Romo, Biosphere II's director of cybernetics. "Biosphere II represents an important moment in human history and I think everyone here shares the excitement."

In addition to the excitement, it represents an $8 million program for HP, including $3 million in hardware and software, and the balance for labor to design and implement the nerve system.

The project has involved virtually every facet of HP's business, including analytical, medical, computer systems, instrumentation, and custom hardware and software, Roger says.

While Roger's project team based at Biosphere II is part of HP's Pacific

Biosphere II's Norberto Alvarez-Romo (second from left) reviews sensor locations with HP project team members (from left) Larry Littlefield, Roger Brathwaite and Greg Vasquez.

Mountain Area in the Neely Sales Region, the scope of Biosphere II reaches throughout HP. For example:

■ The Calgary (Canada) Product Development Center assisted with five real-time applications platform and user-interface platform software licenses to monitor, communicate with and control five of the biomes (extensive communities of plants and animals whose makeup is determined by the

soil and climate). Sensors throughout the biomes collect data and feed the information into HP 48000 Remote Terminal Units—made by the Panacom Automation Division in Waterloo (Ontario), Canada.

■ The Scientific Instruments Division in Palo Alto, California, modified HP ChemStations to help monitor gases from six areas in Biosphere II.

■ Equipment from the Medical Products Group in McMinnville, Oregon, will help the biospherians identify

potential health problems from the high-humidity environment.

In addition to linking the various HP products, the HP project team has to orchestrate the software development and implementation of five contractors.

From the beginning, obstacles to Biosphere II's success were immense. For one thing, biologists and engineers don't necessarily talk the same language or look at the world the same way. SBV had to rethink some of its original ideas. For example, it's not practical to put bar codes on bees.
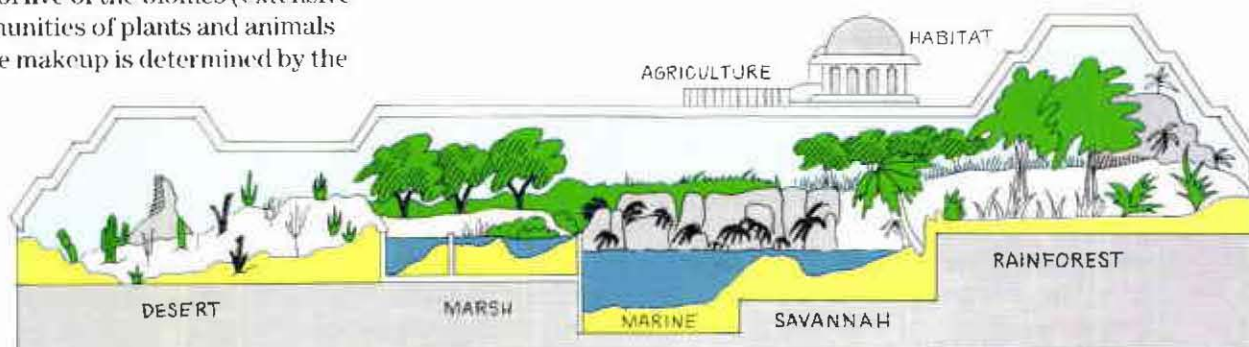
A miniature Earth, the "biomes" compress seven ecological zones into a space the size of three football fields.

Marrying technology with life sciences was a major challenge, says Taber MacCallum, analytical systems manager for SBV. "Engineers and ecologists are usually in two opposing camps: The ecologist asks, 'What will the temperature be?' and the engineer approaches it as 'What do you want it to be?' It was difficult for engineers to work on a project where the specification wasn't already determined."

On the other hand, at first SBV wanted sensors about every four inches above and below the soil to collect and analyze air quality, humidity, gases and so forth.

"They envisioned about 12,000 sensors until they realized that the cost is about $2,000 per sensor—and that after two years they would end up with nine gigabytes of data," explains Larry Littlefield, HP project consultant for

> "(Biosphere II) is the most interesting scientific project in the U.S. since the early days of the Apollo space program."

Biosphere II. "That's about 3 million pages of information."

The customer settled on 3,500 sensors throughout the seven biomes:

■ **Human habitat.** Biospherians will live in a five-story domed building which contains laboratories, computer and communications facilities, as well as video and recreational equipment.

■ **Intensive agriculture.** In this 24,000-square-foot biome researchers will grow 150 different crops in rotation and raise a variety of animals, including chickens and pygmy goats and pigs. Carl Hodges, director of the
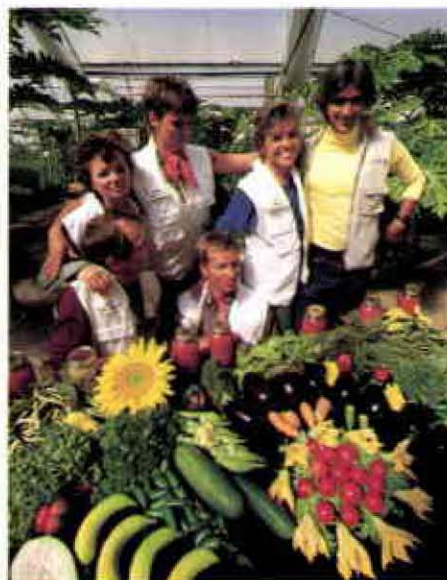
Eight "biospherian" candidates will live off fruits, vegetables and other items they grow.

Environmental Research Laboratory (ERL) at the University of Arizona, designed this biome. (The ERL also designed the popular Land pavilion at Disney World's Epcot Center.)

■ **Tropical rainforest.** Patterned after the Amazon rainforest, the area includes plants and trees such as ginger and bananas, and a waterfall.

■ **Tropical savannah.** Thousands of termites will help nutrient recycling here by eating and breaking down dead plant material. The termites also will be a food source for wild animals. That's life in the food chain for you.

■ **Marsh.** Modeled after the Florida Everglades, the marsh biome begins with a freshwater stream which runs into a tidal estuary—picking up salt along the way—and flows to the ocean (marine biome).

■ **Marine.** Designed after a Caribbean coral-reef ecosystem, the marine
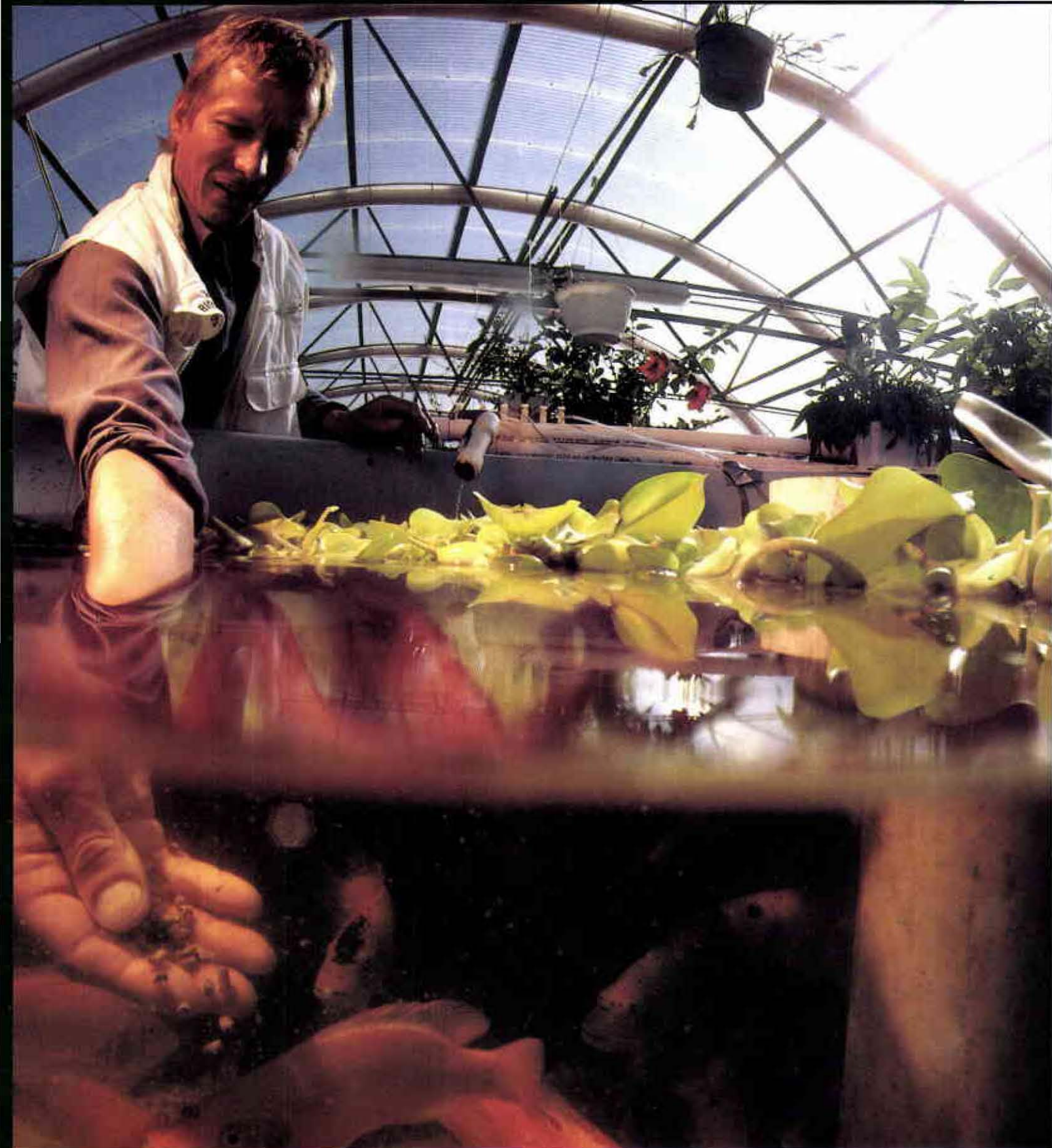
Bernd Zabel, one of 14 "biospherian" candidates, feeds carplike tilapia fish which eat waste-plant products and will serve as a food source.

biome includes a 25-foot-deep ocean and even wave action (generated mechanically). Scientists and an estimated 1 million paying visitors a year can see the health of the biome by peering through viewing windows outside Biosphere II. Dr. Walter Adey, director of the Marine Systems Laboratory of the Smithsonian Institution, designed the last two biomes.

■ **Desert.** Similar to Baja, California, the desert biome features low rainfall but high humidity. Plants will bloom in the winter—when the other biomes are dormant —and be dormant in the summer when other biomes use carbon dioxide for their growth period.

Two external "lungs" will help Biosphere II "breathe" and compensate for shifts in atmospheric pressure.

The eight biospherians—the same number of humans on Noah's ark— will spend about four hours a day on

> *The termites also will be a food source for wild animals. That's life in the food chain for you.*

research and scientific experiments, and another four hours tending to crop, animal and maintenance chores.

They'll eat about 2,500 calories a day from a menu of corn, blueberries, cauliflower, pumpkins and 26 other crops. They'll breed chickens, pigs and fish, including carplike tilapia fish which eat waste-plant products.

Naturally, Biosphere II has its skeptics. Some have charged that there are too many uncontrollable variables to yield significant results. Some say the biospherians are "playing at being scientists." And others see a scientific

Researchers inside Biosphere II will use ladybugs instead of pesticides to control unwanted insects.

project which, they maintain, has evolved into an environmental Disney World. (Eventual costs may run as high as $150 million.)

But while the planet-in-a-bottle venture has its critics, it also has its share of successes.

SBV conducted three experiments —lasting from five to 21 days—inside a closed-system test module—during the past two years. These gave HP the opportunity to test and refine its complex prototype nerve system. The module, however, was 1/5,000th the size of Biosphere II.

"For Biosphere II to work, it has to have highly integrated systems," says Lew Platt, HP executive vice president, Computer Products. "Because it demands a sound link of our measurement and computer capabilities, it gives HP a good test bed to demonstrate those capabilities."

Perhaps the most significant Biosphere II-related discovery has been soil-bed reactors. Researchers found

that when they pumped polluted air into everyday dirt, microbes in the dirt fed on contaminants in the polluted air. The microbes then produced carbon dioxide. Plants—you'll remember from high school science classes—use carbon dioxide to produce oxygen, which humans and other living organisms need to breathe.

So the answer to air pollution may have been under our feet all along!

"Imagine how this could be used for heavily polluted air in a region like Los Angeles," Larry says.

As Roger Brathwaite's HP team nears the September 21 target date for

> *While the planet-in-a-bottle venture has its critics, it also has its share of successes.*

sealing Biosphere II, it's right on target for meeting its scope, budget and schedule goals. All confirmed science-fiction buffs, the team members say they'll probably never work on another project like this one.

"No matter what happens, it's a success because we've learned so much about integrating HP equipment," Roger says. "We invented the 'glue'— namely the customized software— that pulled the project together. Biosphere II could produce some new applications for HP hardware and software products."

And, on a personal level, Biosphere II had a special effect on Roger. "My son was 12 years old when he first saw Biosphere II, and he decided then that he wants to be an engineer. You can't visit here and not get caught up in the concept. It's another world." ■

EXTRA/ ORDINARY PEOPLE

By Liz Wavada

Each week Spokane (Washington) Division's Mark Johnson (left) and Dave Whipple trade the relative quiet of HP for the hubbub of high-school physics classes.

cold, gleaming mouthpiece to his lips. Into the still morning he sounds a steady note. It blares above the engine's whine as the Porsche blasts in front of the incredulous students and fades into the distance.

Every February for the past four years, a senior class has huddled outside a high school near Spokane, Washington, wondering what this guy from Hewlett-Packard is up to. But when Mark Johnson, also known as Dr. J, designs a physics experiment, they remember it.

Mark, a mechanical engineer at HP's Spokane Division, divides his time between two laboratories. He works in the division's R&D lab and helps out once a week putting together lab experiments for a local high-school physics class.

To explain the Doppler effect*, he says nonchalantly, "All you have to do is get in the car and floor it in first gear till you red-line it and the student blows middle C on the horn."

A few years ago, when it seemed that everyone in America with a vested interest in education was flailing about, looking for programs and finding blame, Mark slipped unnoticed into a high-school classroom. If he had an earring, he could pass as just another dude from the suburbs.

"Each year, that's what I do on the first day of class," Mark says. "I sit down in a desk so they think I'm one of the students." One time, when Mark was waiting for a class to begin, the vice principal asked for his hall pass.

The trick to good teaching is bringing in something that kids can relate to — such as a silver Porsche 924. It holds their attention while Dr. J, his eyes focused intently on the blacktop straightaway, grips the steering wheel, guns the engine and prepares to explain the Doppler effect.

Silently, the sun roof rolls back. A student, trumpet in hand, stands up through the opening and brings the

* *The Doppler effect or Doppler shift is a change in the frequency with which waves (as sound, light, or radio waves) from a given source reach an observer when the source and the observer are in rapid motion with respect to each other so that the frequency increases or decreases according to the speed at which the distance is decreasing or increasing.*

Extra!
ORDINARY PEOPLE

"I tell them I'm not much on titles," he explains. "I say, 'You can call me Mark or Dr. J.'"

His eyes light up when he describes his latter-day classroom experiences. "I was sort of like the students I'm teaching now. They have an interest in science but they're not motivated. It's really hard at that age to see where it's all headed."

But Mark had an advantage that few enjoy. He went to high school in prosperous Los Altos, California, and had lots of encouragement at home. "I guess you could say I grew up in the space program. My father was a physicist at Lockheed and my best friend's father trained astronauts," he says.

Five years ago he took a year-long leave of absence to travel through Europe and live the examined life. He emphasizes that this period was "pre-1,000 points of light."

"At that time, my dad was working for the Reagan administration as direc-

"If the president of the United States has time, then I've got time."

tor of Space Science and Technology. I started to think that if Byron [Byron Anderson, general manager of Spokane Division] has time to talk to high-school groups, if the president of the United States has time, then I've got time," Mark explains.

On his own initiative he called up the principal of Central Valley High School and volunteered to help a teacher with physics labs. Dennis McGuire returned the call. "It was a great situation to have," Dennis says. "I was new in teaching. Before I got my education degree, I was a microbiologist. I really appreciated the help. Mark is laid back. He's someone the kids can relate to. He comes in wearing blue

To explain the Doppler effect—a principle involving the frequency of sound waves—Mark drives down a long stretch of highway while Dave hits a high note on a trumpet.

jeans and a T-shirt, and that's not what they expect to see from someone in business."

Says Mark, "There's a lot of management support behind me, and doing it over my lunch hour makes a minimum impact on my work."

Last fall, after three years at Central Valley High, which is also the school that HP "partnered" with in 1984, Mark decided to move on. He wanted to go to another school, one that "needed the help a little more." But before he left, he found a replacement.

Mark had asked Dave Whipple, an R&D project manager at the Spokane Division, to visit the CV physics class on occasion to explain electrical theories and concepts. So Dave, HP's campus manager for Washington State University, found himself recruited into a high-school classroom.

CV's senior physics class starts after lunch. About 20 students, mostly boys, are sitting at a lab table, talking loudly, so they can hear each other over the Dire Straits tunes playing on a boom

box. They wear shorts and sandals. The class iconoclast sports a Bart Simpson T-shirt declaring "Underachiever, and proud of it."

"This is a college prep class. It's preaching to the choir, it really is," Dave says. The students, nearing the end of their senior year, are studying for the Advanced Placement Tests. All are college-bound.

Nanette Palmer has a scholarship to the Massachusetts Institute of Tech-

"Electricity is just so far beyond imagining. Dave makes it more real."

nology and wants to major in aerospace engineering. In her sophomore year she went to NASA's Space Academy in Huntsville, Alabama. "I fell in love with the astronaut program," she says. "And this year I fell in love with physics. But I've always been in love with math."

Out of the six girls in the class,

Mark demonstrates an electric circuit for students in Greg Berg's (rear left) Post Falls High School physics class. "I know the students like it that I'm there," Mark says.

Nanette is the only one who wants to pursue engineering. "Only one of my friends wants to go into something with any degree of difficulty."

She appreciates Dave's ability to demonstrate abstract concepts. "Electricity is just so far beyond imagining. Dave makes it more real," she says. "You read the book and wonder how can you ever make this happen."

Says Dave, "I really enjoyed high-school physics when I was that age. I remember some of the labs that really amazed me. In one, we used Slinkys to study propagating waves.

"I try to tell them why it's important and put it in terms they can understand. I talk about cars or running or jumping," he says.

"Still, I ask myself, 'How do you really reach these kids?' I haven't come up with the answer." He ponders the array of problems in education today. "Kids and society in general have been real turned off to science. There's a technological backlash. People are saying it's science that got us

into this mess. And secondly, with both parents working, there's less involvement. They expect schools to do it all."

Dennis keeps the class on a tight rein. The atmosphere is decidedly academic. "This is when I give them my end-of-the-year speech," he says. "If they think they get to quit learning just because they're graduating...."

As the bell rings, Dave hurries to pick up some power supplies and other lab materials that Mark needs to borrow for class the next day in the school where he now volunteers.

Post Falls, Idaho, is a lumber town, mainly. Sliced in half by Interstate 90, it's a 10-minute drive from HP in Spokane. "Guess which school has more money," Marks says.

Science teacher Greg Berg admits he was a little suspicious when Mark offered his services as lab assistant. "I wondered what his ulterior motive was, but then I thought, 'Something for nothing, great!' "

It was the first time in Greg's 18

years at Post Falls High School that anyone from business ever volunteered to help him teach. "I thought it was pretty nice that he thought of old Post Falls instead of going with the rich boys," he says.

The school's physics class has about a dozen students. It's the school's only physics class. All the students are seniors; all are honors students.

"I don't think the kids knew quite what to make of him at first," Greg says. "It took them a while to accept that he knows what he's talking about."

Greg relishes his success stories —a former student who's studying medicine at Johns Hopkins, another working as a chemical engineer.

Mark says, "I know the students like it that I'm there, but what makes it worthwhile for me is the way it boosts the teachers' morale. They can get kinda burned out. They're happy someone cares."

Both Dave and Mark say they'll continue their classroom stints next year.

> ## *"There's a technological backlash. People are saying it's science that got us into this mess."*

Says Dave, "Dennis maybe sees more value in me being there than the kids do. But the help I give to him, a lot of that stays behind even if I don't." ∎

(This is the first Measure article by Liz Wavada, senior communications rep at the Spokane (Washington) Division. Although she received an "A" in her high-school physics class, she regrets the fact that the nun who taught the class didn't use a Porsche and a trumpet to explain the Doppler effect.—Editor)

A chilling experience on "ice island"

It's no ordinary safari as big-game hunters set out in search of "elephants" in the wilds.

These hunters actually are researchers seeking large deposits of oil and gas ("elephants" as they're called), and the wilds are the waters in the remote Beaufort Sea—northeast of Alaska.

To search for these deposits, several oil companies constructed ice islands — layers and layers of frozen seawater on which the companies erected platforms for exploratory drilling.

In 1988, Esso Resources in Calgary, Canada, chose HP's real-time applications platform (RTAP) software—produced by HP's Calgary Product Development Center (CPDC)—to monitor and display data related to the island's environmental conditions.

On the island, sensors were connected to a data-acquisition system, which consisted of eight HP 48000 remote terminal units (from HP Canada's Panacom Automation Division), an HP 3852 data-acquisition system, an HP 319 host computer/control unit, and RTAP and customized software from a systems integrator.

The sensors tracked information critical to the island's safety and stability, including weather conditions, temperatures and stresses in the ice, and ice movement around the island.

HP equipment was on site on the ice island from mid-December of 1988 until mid-March of 1989, says Steve LaCourse, CPDC marketing engineer. "The windchill factor dropped temperatures to as low as 110 degrees (Fahrenheit) below zero," Steve explains. "Our equipment worked flawlessly."

Because a gravel island in the same area would cost about four times as much to construct, oil companies may continue to use ice islands in the Beaufort Sea. And HP gear may be right in the thick of it again.

above

One of several oil rigs on "ice island" lights up the sky over the Beaufort Sea.

above

The island builders used four water cannons to pump 20,000 gallons of seawater a minute into the Arctic air. HP equipment helps researchers monitor the island's stability, including temperatures and stresses in the ice.

left

The windchill factor plunged to as low as 110 degrees (Fahrenheit) below zero.

above

Seawater—shot into the air by massive pumps—crystallizes and falls as snow. The snow formed layers and layers of ice which ultimately measured 20 feet below and 25 feet above the water line.

Ice island

above

Researchers use exploratory drilling in the remote Beaufort Sea to search for large deposits of gas and oil called "elephants."

above

By June 1989—when temperatures climbed to 50 degrees Fahrenheit—the island had melted. But the cost of the experiment was about one-fourth that of a gravel island and the environment returned to its original state.

YOUR TURN

Euro-ignorance

It was encouraging to see *Measure*
(May-June 1990) promoting an interest
in Europe. What a pity that this article
should expose such a level of
ignorance.

The map on page 15 contains several
inaccuracies. The territory shown as
"Great Britain" can, in fact, only lay
claim to being England plus Wales.
Scotland is *not* some appendage just to
the north; it is very much part of Great
Britain. (Can you imagine *Measure*
publishing a map of the U.S. with
California shown as a separate, but
attached, country?)

And by the way, Ireland is *not* part of
the United Kingdom, and Switzerland
is *not* part of the EC.

ROB PEARSON
South Queensferry, Scotland

We would like to compliment Mary
Weed on her informative and well-
written article on Europe on the way
to 1992.

There are, however, two small points
we would like to raise, concerning the
map given.

First, while we know of one Scot
who was delighted to see Scotland
separated out for individual attention,
we know of one Irishman who was a
little irritated to see Ireland denied its
separate membership and brought
back into the United Kingdom.

The second point is that Switzerland
should be removed from the map as
it is not a member of the European
Community.

It is an unfortunate mistake, mostly
because it is the diagrams that make

A map helps show the 12 countries which
really belong to the umbrella organization
called the European Community.

the initial and the more lasting
impression of a piece, and this map
is obviously inconsistent with the
care taken with the rest of the text.

It is also unfortunate that, even on
the brink of a unified Europe, it is how
we are different that will arouse the
greatest passions.

MICK CLOUGH and
DAVID HEGARTY
Böblingen, West Germany

We over here like to read articles about
the various countries where HP is
represented.

As a citizen of Belgium, living in
Switzerland and working for HP the
last 26 years, may I draw your attention
to the following minor error?

The red area on the European map
covers 13 countries and not 12. The
13th country, Switzerland, is not a

member of the EC, but a member of
the European Free Trade Association.

By the way, congratulations for the
very good articles and the excellent
printing quality of *Measure*.

ALBERT MAGDELYNS
Widen, Switzerland

The Measure *staff is guilty, as
charged, for mistakenly including
Switzerland in the EC and wrongly
defining the countries which com-
prise the U.K. Mary Weed, the pri-
mary writer of the "1992" package of
stories and holder of a Ph.D. in inter-
national relations, wasn't given the
opportunity to review the map or cap-
tion. As punishment for our crimes,
the* Measure *staff has volunteered to
spend three months traveling around
Europe to familiarize ourselves with
international geography.—Editor*

Simply the best

I think your ExtraOrdinary People arti-
cles are super, but this last one about
Ann Johannessen is the best. I love
people who like to do voluntary jobs
and help those less fortunate. I think
she is a wonderful person.

A language barrier never is a prob-
lem when people like her try to help
others.

MIRIAM CESPEDES
Palo Alto, California

In touch with promotions?

I read a very interesting article in the May-June 1990 issue called "HP helps key National's success."

It seems that the company can sell a lot of PCs, terminals and some other more expensive equipment with the aid of the Touchscreen Plus (for VGA monitors), but I have not seen much activity promoting that product. It can be sold to commerical malls, department stores, automated factories, medical instruments, etc.

Maybe it is a good idea to write an article selling that idea.

RICARDO DIAZ-DE-LEON
Guadalajara, Mexico

Recycling recycled

Regarding traditional glossy papers, please remind *Measure* readers that many recycling centers take "miscellaneous other paper" and that once-read magazines and periodicals are also in demand by schools, hospitals and senior centers. That's a form of recycling, too.

Thanks for sending *Measure* to employees' home address. It gives me a (much appreciated) broader perspective on HP than my husband's stories about Cupertino provide.

JO FALCON
(wife of Bill Spears)
San Francisco, California

I'm glad to see that HP is making an effort in controlling deforestation by using recycled paper. Deforestation
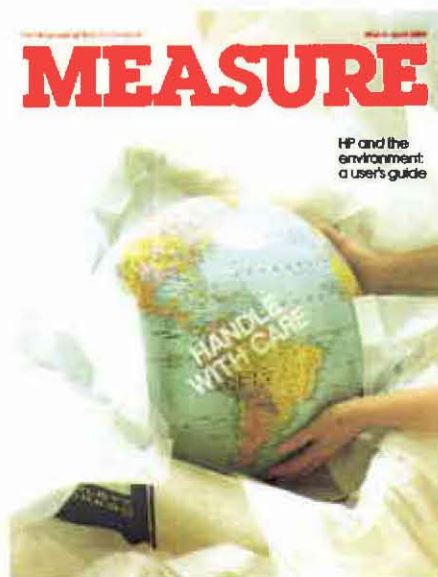
is among the prime concerns in most Third-World nations.

Why doesn't HP begin a "tree-adoption programme" where each employee contributes funds to bear the cost to raise a tree from seedling to actual reforestation? In return, each "adoptive parent" will have his or her name put on the tree.

LIM KONG THIEN
Penang, Malaysia

The recycled section looks great and, overall, the whole issue is great. The recycled pages are really super and the section is a super guide to a different approach.

JOHN ROUSSOS
Montreal, Canada

World without walls

As I read your article on "Breaking down the walls" (March-April 1990), my heart gave thanks for living during this period of profound change.

As mentioned in the article, HP established its presence in the USSR in

1969. Ironically, I was in Vietnam that year, fighting the Communist-backed forces of the North. Being a Soviet (Ukrainian) descendant, I was later troubled by what seemed to be an insoluble internal conflict: I was of Soviet ancestry, and yet, the Soviets were said to be our enemies.

During the nuclear-tense years of the Reagan era, these feelings were intensified by the threat of annihilation. In 1989, I was surprised and gratified by the political and social reforms that swept through the Soviet arena. I am proud to work for a company that recognized early the need for global cooperation in the marketplace, a global village that no longer needs any walls.

AL ZAYIIA
Cupertino, California

LETTER FROM JOHN YOUNG

President John Young writes about the importance of customer satisfaction.

This issue of *Measure* features our INTEREX Users' Group. The article is a good reminder of the central role customers play in shaping our plans and in determining HP's success in today's fiercely competitive environment. Our corporate objectives state our fundamental belief this way: "The central purpose of our business …the reason HP exists…is to satisfy real customer needs."

Customer satisfaction is called out in our corporate objectives because it so directly affects our profitability and growth. Fully nine out of 10 customers in our surveys who rank themselves as highly satisfied say they would definitely or probably buy from HP again. This satisfaction translates into profitability because it costs five times more to gain a new customer than it does to keep an existing one.

In addition, enduring customer loyalty is an asset that has proved incredibly valuable during periods when we're making the transition to new products, such as during our rollover to RISC-based computer systems.

How are we doing on customer satisfaction? The answer depends on one's point of view, and I think it would be useful to view our performance from three different perspectives:

■ how we stack up with our competitors;

■ how recent results compare to what we achieved in the past; and

■ how far we are from what customers consider ideal.

John Young addresses the 1989 INTEREX conference in San Francisco.

You'll see that the grading gets tougher as we move through those points of view. So let's start with where HP shines in comparison with our competitors. Numerous industry surveys of reputations for quality and customer satisfaction lead to this simple conclusion: No one does it better than HP. The consensus spans our many product lines and geographic locations. I won't try to list all the surveys here because to do so would take more than my allotted space.

Now let's look at customer satisfaction from another perspective: our progress over time. As part of doing TQC on the overall satisfaction process, in 1988 we initiated our first worldwide survey of customer satisfaction. In addition to gauging overall satisfaction, the survey asked customers to rate our performance in 10 areas:

Sales information and literature, interaction with HP people during the selling process, product documentation, delivery and installation, administrative services such as invoicing, software, hardware, educational services for customers, service and support, and cost of ownership.

We repeated the survey last year, so we now can begin to track our progress over time. I'm pleased to report that our "overall" satisfaction rating

rose last year and that we achieved improvements in eight out of the 10 categories listed above. I won't report our actual ratings here, because they're competitive information. However, a videotape summarizing our performance will be available within the next couple of months, and I strongly urge you view it. (Editor's note: Copies of the videotape will be available in August through your G.M. or site communicator.)

Why is it so important for you to see that tape? Because, as I said, the third and perhaps most important way to evaluate our performance on customer satisfaction is to compare our results to what customers consider ideal. And judged by that standard, we have plenty of room for improvement. On a scale of one to 10, customers don't rate us "a perfect 10." And in some satisfaction categories, we are "vulnerable" with some customers—that is, they rank our performance at five or less in a category they deem important.

So the name of the game is continuous improvement—TQC. We can't afford to rest on our laurels. Because in the future, as different vendors' equipment becomes more compatible and customers have more choices, we have to make it easy and compelling to choose HP.

We want that choice to be HP. We should be pleased that the new rules of competition play to HP's strength in customer satisfaction. But we should also be challenged to reach for "the perfect 10" in our customers' eyes.

John

Extra!

The winning Purcell Marian team contemplates the problem.

A tournament out of this world

How do you write a software program using artificial intelligence to control a robotic vehicle on the planet Mars?

That was the problem facing 16 teams of high school students from Ohio, Indiana and Kentucky in April during the fifth annual CompuTourney computer contest, sponsored by the College of Mt. St. Joseph, General Electric Aircraft Engines and HP sales offices in Cincinnati and Cleveland, Ohio.

The half-day competition—held on a Saturday at the two HP sales offices — was the final round of the two-part tourney. To qualify for the finals, teams of students had to design and implement a video store computer system.

First-, second- and third-place teams from each office received an HP Vectra personal computer, HP PaintJet color printer

and HP plotter, respectively. Each student on the winning teams also received an HP calculator.

"My students not only gained an appreciation of what Hewlett-Packard is about, but also felt good about themselves as capable young people with potential," one high school advisor wrote. "The CompuTourney also impacted the atmosphere of the school and the need for students to take technologically oriented courses."

The HP organizers hope the CompuTourney expands throughout the sales area and region next year, and that it eventually will be a U.S.-wide event. HP people interested in receiving instructions on how to run a CompuTourney may contact Paul Miller, Jerry Felix or Frank Nishimori on HP Desk.

Have an idea for an HP book?

Something new is being added to the book business: The Hewlett-Packard Press, a partnership between the company and Addison-Wesley.

The Press will publish high-quality books about HP's products and technologies—many written by HP people. This is the first time that HP buffs will have an identifiable series of books about the company.

There will be 12 books published this year, with 20 annually in future years. For more information on how to send in a proposal,

Delphine Bieszard gets a hug from Polish Solidarity leader Lech Walesa.

Memorable day for Delphine

It's been nearly a year since Delphine Bieszard witnessed history and met one of the world's most noted political figures, but she'll never forget the

Marc Barman, Bob Grady and Debbie Caswell chat with Exec V.P. Dick Alberding at the publishing kickoff reception.

writers may tap into LP AUTOINFO on HP Desk.

Editorial director of the Press is Bob Silvey of Corporate Marketing Services, with John Wait of Addison-Wesley as editor-in-chief.

experience.

Delphine, a software-application specialist at HP's Colorado Springs (Colorado) Division, was traveling with a tour group in Poland in September 1989 at the same time the country elected its first non-Communist prime minister since World War II.

The tour group also met and talked with Polish Solidarity leader Lech Walesa for an hour.

"As soon as he walked into the room you could feel it," Delphine says. "He is very charismatic. He's very personable, very outgoing."

A monk sprinkles lustral water to dedicate HP Thailand's new office.

Grand opening blessings

It was both a solemn and joyous occasion in February when HP Thailand held its grand-opening ceremony—including a special blessing by the chief monk from the local Buddhist temple.

About 200 guests observed as the monk sprinkled the office and HP executives with lustral water, and anointed the HP logo and demonstration room with ceremonial white paste.

Among the attendees were Daniel O'Donohue, U.S. ambassador to Thailand; Prachuab Chaiyasarn, Thailand's minister of science, technology and energy; Alan Bickell, V.P. and managing director of HP's Intercontinental Operations; Alex Chan, HP G.M. for Southeast Asia Sales; and Larry Amsden, HP Thailand G.M.

Barcelona ships first products

Things are definitely on the move at the Barcelona Peripherals Operation (BPO) in Spain.

On March 19, BPO shipped the first two models of high-end drafting plotters to be designed by its own R&D team—and held a party to celebrate.

The plotters are enhancement products of the San Diego Technical Graphics Division's Draft Master line. They have been upgraded to HP's proprie-

Franco Mariotti, Exec V.P.-Europe, and BPO G.M. Antonio Perez lend a hand.

tary HPGL-II graphics language.

On June 1, BPO moved into its first HP-owned building in Sant Cugat del Valles, a Barcelona suburb.

BOTTOM LINE

Hewlett-Packard Company reported a 16 percent increase in net revenue and a 16 percent rise in orders for the second quarter of its 1990 fiscal year, ending April 30. Earnings from operations rose 2 percent from the year-ago quarter, but net earnings were down 8 percent. (Year-to-year comparisons shown in parentheses for FY89 are made to a base period prior to the acquisition of Apollo Computer.)

Net revenue for the quarter totaled $3.3 billion ($2.9 billion).

Earnings from operations for the second quarter were $294 million ($289 million). Net earnings totaled $186 million or 78 cents a share on some 241 million shares of common stock outstanding ($203 million or 86 cents a share on about 235 million shares).

Orders for the quarter totaled $3.5 billion ($3.0 billion), up 16 percent.

In the first six months, net revenue at $6.4 billion ($5.5 billion) was similarly up 16 percent. Net earnings declined 9 percent to $359 million or $1.50 per share ($396 million or $1.69 per share).

CHART CHANGES

In the Networked Systems Sector, the Computer Manufacturing and Planning Group has been phased out. Its former Computer Manufacturing Division under **Dick Love** becomes Computer Manufacturing, which reports at the sector level.

The Peripherals Group now reports directly to Chief Operating Officer **Dean Morton.**

The former San Diego Division is now the San Diego Technical Graphics Division. At the same site, the former San Diego Printer Operation has division status. It is now the San Diego Color Imaging Division.

In the Information Networks Group, the Information Networks Division (IND) and Business Networks Division have been recombined under the IND name. General manager is **Steve Markman.**

NEW HATS

Brian Moore to the Workstation Group management team handling major projects, strategic alliances... **John Kenny** to operations manager, Exeter Computer Manufacturing Operation.

HP's Bicycle Factory attracts visitors to the Smithsonian Institution.

Historical exhibit features HP

With sponsorship from HP and several other companies, visitors to the Smithsonian Institution's National Museum of American History can see and participate in the most complex interactive exhibition the museum has had.

The Information Age: People, Information & Technology exhibit opened in May of this year in Washington, D.C., and will be on display indefinitely.

From the invention of the telegraph to today's computer age, the exhibit traces the impact of electronic-information technology on society.

More than 10 miles of computer cable span the exhibit's 14,000 square feet, controlling 43 video monitors, 52 laser video-disc players, 20 touchscreen displays and 24 bar-code scanners.

HP contributed more than $500,000 of support, including the popular interactive exhibit, The HP Bicycle Company. Museumgoers can design a bicycle using a high-powered, 3-D engineering workstation.

GETTING TOGETHER

HP and Actel Corporation will cooperate in developing and making an advanced family of field-programmable gate arrays. HP will make a 5 percent equity investment in Actel.

HP has purchased a minority equity position in Cascade Microtech Inc. and licensed to it certain wafer-probing technology developed by HP.

IN REMEMBRANCE

In memory of the late **Malcolm Kerr,** who passed away in April, a memorial tree has been planted on the grounds of the Melbourne, Australia, headquarters of the Australasian Region. Kerr had served as managing director of the region since 1985.

NEW PRODUCTS

The Computer Systems Group introduced 10 new systems-management products which extend the capabilities of HP's high-end RISC-based systems.

The Panacom Automation Division offers Asian-language keyboard support for the HP 700/X fam-ily of X Window System graphics terminals. A new **HP 700/X** second-generation family features an 80 percent increase in interactive graphics performance and can operate with a standard AT2-style keyboard.

HP NewWave 3.0 software from the Santa Clara Information Systems Division offers full agent capability and the ability to share objects on a network....A new miniature rotary pulse generator **(HRPG-Axxx)** from the Optoelectronics Division uses HP's own reflective-optics technology (employing an LED light source and photo sensor).

HRPG-Axxx

The Waldbronn Division has new offerings in liquid chromatographs that give improved performance to analysts running a high volume of samples using established methods **(HP 1090 Series II/L)** as well as those developing and testing analytical methods **(Series II/M).**

# PARTING SHOT

Marty scores a literary hit

Marty Slattery was a frustrated writer with two unpublished novels and a stack of assorted other stories back in the mid-1960s when he did a strange thing: One day he sat in front of a roaring fire and burned every single page of material he had written.

"I was discouraged and figured I'd never sell any of my writing," says Marty, a customer-service rep in HP's Englewood, Colorado, sales office. "I didn't write again for about 12 years."

This spring, Marty beat 1,000-to-1 odds when a publishing company, St. Lukes Press, accepted his manuscript and published his novel *Diamonds Are Trumps.*

The story is about a washed-up, middle-aged baseball player who toils away in the minor leagues while trying to make a comeback to major league baseball.

Although probably too bawdy for kids, the book
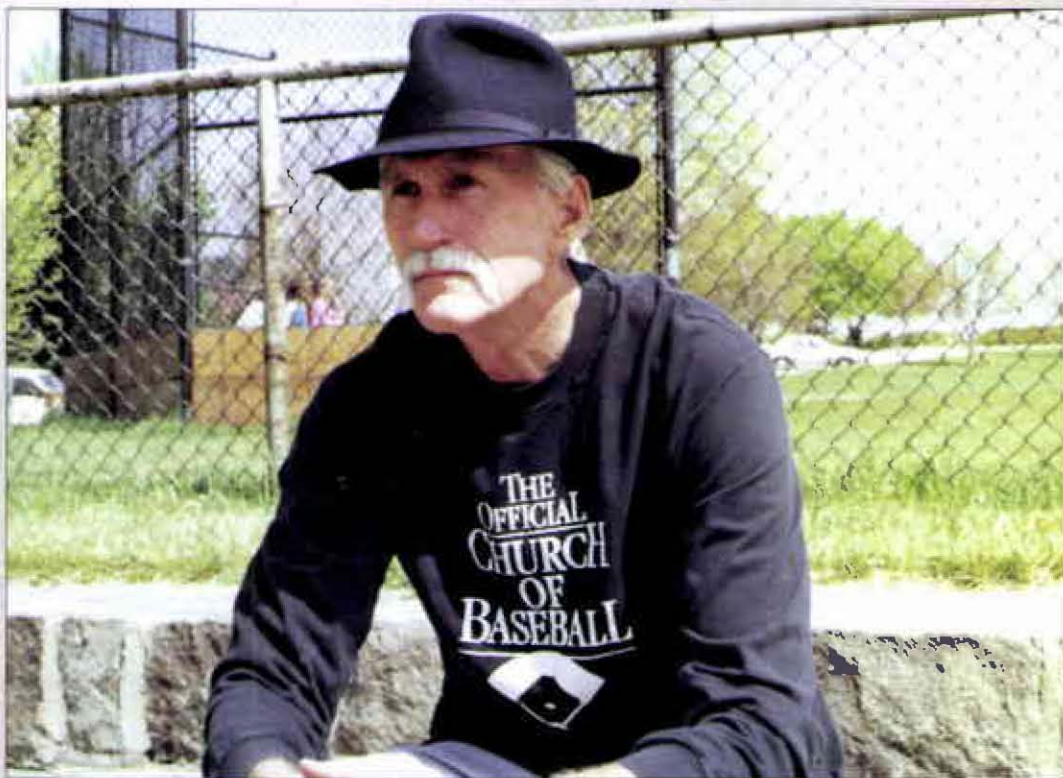
HP's Marty Slattery pitches his new baseball book *Diamonds Are Trumps.*

has received several glowing reviews, including one from Tommy Lasorda, manager of the Los Angeles Dodgers: "*Diamonds Are Trumps* is sensational," Tommy says. "Slattery did a great job."

Marty, who has never taken creative writing classes, captured the

essence of minor-league baseball in his book by traveling throughout central California to games in cities such as Lodi, Fresno and Rohnert Park. "Little fields in little towns have a special appeal to me," he says.

Marty says he has no illusions about making a living as a writer. "My biggest satisfaction would be if a lot of people read my book and like it," he adds. "That's success to me."

MOVED LATELY? CHANGE OF ADDRESS SHOULD BE REPORTED TO YOUR PERSONNEL DEPARTMENT.