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The Valley Culture

Intel is the world's pre-eminent and most profitable maker of integrated circuits, those silicon chips that power everything electronic. The company employs twenty-five thousand people and had revenues in 1993 of $8.78 billion, along with one of the highest earnings per employee ratio in the world. The heart of its value lies in its research and development projects, which were expected to reach $3.5 billion in 1994. Andrew Grove, the President of Intel, is fond of proclaiming that his people routinely "bet the company" on huge research projects. In wilder moments, he expands this to declare that they "bet millions on science fiction."

Intel today functions in some ways almost like the old Bell Laboratories—a private company whose commitment to research qualifies it as a national resource. But Intel seems nothing like the old Bell Labs when you pay a visit, for the place is saturated with Silicon Valley style—informal, fast-moving, nonbureaucratic, wildly diverse. There is little similarity to the traditional military ethic and strict hierarchical structure that prevailed at, and indeed epitomized, pre-divestiture AT&T.

When you drive up to Intel's headquarters, a sprawling five-story building of sky-blue glass that looms over the suburban strip of Route 101 running through Santa Clara north from San Jose, the first thing you notice is that there are no reserved parking places in the vast lots: it's first come, first served, no matter who you are. Inside, too, the nonhierarchical Valley ethic prevails, for everyone, from the Chairman to support staff, sits in cubicles, which are available only in several sizes. The outer rim of walls is not blocked off by enclosed offices as in most buildings; it rises above the cubicles, enabling natural light to fill every floor for an open, spacious feeling. Intel's fluid and egalitarian use of space, which will be discussed more fully in Chapter 8, is worthy of note, for it reflects much about how the company is structured.

The organizational chart is very flat, with only six layers for thirty-five thousand people—down from thirteen layers in the early eighties. Virtually no positions are solely supervisory. Lines of command are multiple and diffuse, with much overlapping of departments, and everyone reporting to multiple bosses, performing multiple jobs, and sitting on multiple councils. This overlapping enables the company to run as leanly as possible, for people are constantly being shifted to where they are needed, which saves having to overhire in times of expansion. Reorganization is continual and evolving, a way of life; there is no such thing as a static job. Carlene Ellis, presently Vice President for Information Technology, points out: "I've been here twelve years, and in that time I've had seven different jobs. Fourteen, really, since each job was reorged once, which completely changed how it was done and who for."

One aspect of Intel's culture that made its practice of constant reorganizations work is its emphasis on nonpositional power. The role of nonpositional power in the formation of webs was pointed out by Ted Jenkins, an engineer with a philosophical bent who has been with Intel since its founding. "Intel's great strength," he declares, "lies in the way the company allows resources to flow to wherever there's a problem. I've thought a lot about why, in so many other companies, this just doesn't happen, and I think it's because in most organizations resources tend to accumulate—they get stuck wherever someone is in a position of great power. So what you end up with in most companies is a few powerful people who have more resources than they actually need, while everybody else has to try to make do with less. It's static, irrational, and inefficient."

Jenkins attributes this situation to the fact that traditional hierarchical organizations are structured specifically to validate and exalt positional power. "In most organizations, it's easy to figure out who's powerful: you just look at where someone stands on the org chart. The only kind of power that really matters is the power of position. That makes it very difficult for other kinds of power to develop. The people at the top hold on tight, so no one else can establish any kind of alternate power base. And it's this absence of other power bases

that permits resources to get stuck." Position, however, is a relatively crude way of measuring power, as Jenkins points out. It cannot begin to reflect the subtleties of alignment in a company such as Intel. "Here, there's no single way of being powerful. The power of position is just one aspect. And I wouldn't say it's the most important aspect at all."

Enumerating alternate sources of power, Jenkins names first *the power of expertise,* of knowing and possessing crucial skills. "A company like Intel very naturally emphasizes the power of expertise because eighty percent of the people we hire are engineers." As in a partnership of professionals—accountants or attorneys—people are chosen because they exhibit specific skills, rather than because they have potential as all-purpose managers. And since skill is so highly regarded, anyone who exhibits an unusual level of skill tends to accumulate power. "We place a very high value on the power of expertise, and the way the company is run tends to increase it," says Jenkins. "We have this intense level of training that never stops, which of course broadens and deepens expertise. Also, because we are continually undergoing reorgs, people move around in the company quite a bit, which also tends to increase the scope of people's expertise."

Moving people around a lot also helps develop another alternate source of power: *the power of personal relationships or connections.* "Because people are always being shifted, they develop a lot of connections in the company as they go along. They know a lot of people, because they've had a chance to work with so many of them—they have personal friendships, and they also have a pretty good idea of what the people they know might be capable of doing. This makes for a very networked organization, with lots of informal lines of communication, lots of links that would never appear on any organizational chart. This is absolutely invaluable when you're trying to put together a team, because people know all kinds of unexpected places to look for various kinds of skills. You can put together a very creative team that gives people a chance to develop new talents—which of course then also increases their expertise."

Ted Jenkins also mentions the importance of *the power of personal authority* as crucial in developing alternate centers of power. In any organization, he points out, you have people who, by virtue of their personalities, their natural leadership skills, and the trust that they inspire, wield a power greater than their official position would indicate. Yet in traditional hierarchies, such people are often viewed as a threat, disruptive links in the functioning of the chain of command. "In a company like Intel, such people really thrive," notes Jenkins. "They make a big difference in terms of where resources flow. And again, the power of personal authority is really emphasized as people get shifted around, because their experience is broadened and more people come into their orbit."

Jenkins believes the primary reasons Intel has been able to encourage alternate centers of power are its penchant for constant reorganizations and the unusually low turnover rate among people who work for the company. "In this organization, people don't leave. They're paid fairly, they have a great profit-sharing plan, and they get a lot of opportunity to move around—it's always something different. In companies where people are constantly leaving, it's hard for alternate power centers to develop.

"It's especially hard to develop the power of personal connections if you're not in an organization for very long, and without personal connections, it's hard to put strong teams together. Everyone knows that companies have two organizational charts—the formal one, listing everyone's position, from the president on down; and the informal one that shows the actual routes of connection that allow things to really get *done*. It's the informal power structure that always determines how effective an organization will be. And stability is essential in order to build a strong informal structure. Also, reorgs don't do much but disrupt a company if people are always coming and going. I think your emphasis is always going to be on positional power if people don't stay with the organization."

In the Heart of the Valley

It seems fitting that Intel should provide an opportunity for watching how webs form and function, for the organization lies at the very epicenter of the ever evolving web of enterprise that is Silicon Valley. Intel was born in 1968, one of the first companies spun off from Fairchild Semiconductor, which was itself the original prototype of a Valley start-up. Fairchild came into being when all the engineers who worked for William Shockley walked out one day to protest Shockley's management style. Shockley had been the head of the Bell Labs team that invented the transistor, but in the early sixties, he had returned to his hometown of Palo Alto to found the world's most advanced semiconductor company. Much later, he would gain notoriety as a proponent of racist evolutionary theories.

The eight engineers who abandoned him to found Fairchild were thus imbued from the very start with a notion of business as a collegial enterprise, one in which expertise should be valued over positional power, and the independence and individual talent of people throughout the ranks should be honored and recognized for what it was: the true strength, the reserve power, of an organization. The Fairchild founders went on to spin off scores of other ventures in the years ahead, thus seeding the Valley for decades to come with talent that was stamped with an antiauthoritarian and egalitarian ethic, while also driven by an entrepreneurial spirit.

Intel was co-founded by the legendary Robert Noyce, a former Shockley protégé and himself a member of the original Fairchild group. Noyce was the co-inventor of the original integrated circuit; it was he who figured out that transistors could be lithographically etched onto silicon chips, then miniaturized many times over, thus permitting dozens of transistors and resistors to exist on a single chip. This invention made possible the drastic shrinking in size of computers, laying the foundation for the personal computer industry. At his death in 1990, Noyce was Chairman of Sematech, a consortium

seeking to build American competitiveness in high technology by pooling research on costly ventures such as supercolliders and superconductive ceramics. The collaborative and integrated nature of this effort was reflective of the legacy Noyce left behind at Intel.

Intel's other cofounder—and still its Chairman—was Gordon Moore. While at Fairchild, he had formulated what would become known in high-tech circles as "Moore's Law," which holds that the number of transistors on a chip will double every eighteen months, which has the effect of continually reducing prices. As a chip loses value, it in consequence drives down the price of any product of which it is a component, spelling financial disaster for even a successful product if it is not upgraded or replaced regularly over time. This quirk means that high-tech value is always defined in terms of how *new* a product is, rather than by how much it costs to produce. Moore's Law was the first formal recognition of a phenomenon that has had tremendous implications for high-tech development, for it made clear that economies of scale would no longer apply in the post-industrial world.

This reversal of a basic premise of industrial economics has occurred because, whereas high-tech development costs are high, production costs continually become cheaper, while the cost of the natural resources that comprise the products is essentially negligible. A corollary to Moore's Law therefore holds that, if values can no longer be wrung out of mass production, they must be created by continually upgrading, improving, and modifying an existing product. The impact of this truth cannot be overestimated. It means that high-tech organizations, in order to survive, must incorporate continual change as part of their daily process: they barely have a month to sit back and bask in success. For no high-technology product can be considered successful in and of itself; *each must be understood as part of the learning curve for what will be produced next.*

Under the leadership of Noyce and Moore, Intel patented the first microprocessor, which mimics the mainframe's central processing unit by integrating logic, memory, and communication chips. The microprocessor made it possible for small computers to handle busi-

ness functions, which enabled desktop machines to move beyond the hobbyist phase. All subsequent advances beyond the mainframe have been based upon this invention, the microprocessor being nothing less than the computer's brain. Having patented this essential device in the early years of its existence, Intel moved quickly to capitalize on its production, its greatest coup being its agreement to produce chips for the IBM PC.

By the mid-late eighties, Intel had established the standard with its 286 microprocessor, known throughout the industry as "the 286." It comprised the guts not only of the IBM PC and all its clones, but those of scores of other computers—more than 100 million machines around the globe. The success of the 286 provided Intel with the huge reserves of cash it needed to fund the costly research that enabled the continual upgrading and improvement of its whole range of products. For given the ruthless exigencies of Moore's Law, which decrees that any high-tech innovation loses value the moment it hits the market, the company had no choice but to make enormous investments in technology, continually developing new products, new versions, new upgrades, and putting them out on the market.

The Threat of Disaster

By late 1988, the time had arrived for the company to introduce the next generation of microprocessor, the successor chip to the 286. The atmosphere at Intel as it prepared for the release is recalled by people in the company as euphoric: after years of work, the 386 was finally ready to hit the market. Everyone was sure that Intel had come up with another winner, for the 386 microprocessor was far from being a mere upgrade.

This represented a major step forward into the future, a revolution in what desktop computers could do. The new chip had 32-bit capacity instead of the standard 16-bit—a tremendous increase in terms of speed, capacity, and power. Developing it had been a great technical success, in the tradition pioneered by Robert Noyce. Every-

one at Intel—the engineers, the marketing department, and the great international sales force—was convinced that once the 386 got out there, it would sweep the field.

Instead, a few months after its introduction, the chip was threatening the company with the specter of almost total failure. The problem had nothing to do with the quality or attributes of the 386. Intel's customers, it seemed, were attached to the 286, which was viewed as the workhorse of the personal computer industry. The 386 was regarded as being useful only if you needed tremendous power; it was also considered very costly. The resistance from the market was of course potentially disastrous for a high-tech company like Intel, and pointed up with particular poignancy the paradox inherent at the heart of Moore's Law. This is that failure can result from any *too* successful product, since its very success will discourage its buyers from wanting to replace it.

When a new product meets market resistance, the producer will very often try to find a way to cut its price, and this is what Intel at first sought to do. The company's executive committee sent the engineers back to the drawing board to develop a scaled-down model of the 386, a version that would have most of its power and could perform most of its functions, but could be priced not much higher than the old 286. An engineer named Dennis Carter, then in his late thirties, was put in charge of the effort; he had been working as Andrew Grove's Special Assistant for Technical Affairs.

"We came up with a chip we called the 386SX," he says. "For what we were trying to do, it was absolutely the perfect product—scaled down, but still a 32-bit chip. The idea was just to introduce people to 32-bitness, get them hooked on that, make 16-bit obsolete forever. We were so excited and proud that we'd got it right. So we put the new chip out there, and then all stood back like good little engineers and waited for it to sell. But we *still* couldn't move it! No one wanted the thing—*no one.*"

Dennis Carter felt that it was incumbent upon him to figure out a solution—or at least to get an inkling where the problem might lie. Intel simply had too much invested in 32-bit technology to accept the

possibility of its defeat. The company's position was particularly precarious because it had just emerged from a major recession that had devastated the computer industry in the mid-1980s. Considering the problem from a variety of angles, Carter tried to imagine just where the hitch might lie. The *market* had rejected an excellent product: so might not the problem lie in who constituted the market, in just who Intel defined as its customer base?

Intel had always defined its primary customers as computer manufacturers, companies like IBM and Dell and Compaq that bought microprocessors for use in the assembly of their products. These "original equipment manufacturers," or OEMs as they're called in Silicon Valley, have traditionally comprised the major market for microprocessor chips. Intel had other, secondary customers as well: manufacturers who sold circuitboards to OEMs, and distributing agents who acted as microprocessor brokers for both circuitboard makers and computer manufacturers. But the OEMs had always been Intel's main customers, and it was in order to serve them that the company deployed and trained its huge sales force.

Certainly, Intel had never considered the people who *bought* computers to be its customers. Nor did it envision itself as selling to MIS professionals, those technology buyers who since the advent of the IBM PC had purchased desktop units for large companies. The consumer market—"end users" in Valley jargon—were viewed simply as customers of Intel's customers, encountered necessarily at one remove. After all, Intel was a technology company, not a maker of consumer products. Since their invention, microprocessors had always been sold as components, internal parts used in the assembly of a larger product. It was considered inconceivable to think in terms of selling them to the public, comparable to the manufacturer of automobile steering columns trying to sell its products directly to drivers instead of to GM or Honda.

And yet, as Dennis Carter considered it, the steering column analogy was not really accurate, for the microprocessor chip is hardly just another component in a complex product. It is, rather, *the* essential element, the piece that powers the product of which it is a compo-

nent; the rest is just plastic shell, and an operating system that interprets the chip's commands. Thus the microprocessor is what the customer *is really buying* when he or she purchases a computer—even if it had never been considered in that way. And so it began to occur to Dennis Carter that perhaps Intel was being stymied in its efforts to sell the 386 because the company misperceived who the customers for it actually were.

"What we began to realize was that 32-bit architecture was great for the computer *user;* since you can run a lot of very powerful and useful programs off it. But the computer *manufacturers* were doing just fine selling products based upon the 286—which not incidentally was also becoming cheaper for them to buy. They were doing very well on it, so they didn't feel any incentive to spend a lot of extra money just to make their products more useful to the buyer. When we considered that, we began to wonder if we weren't making a fundamental mistake, counting on the OEMs always to represent our interests in the market. Here was an obvious case of their interests not necessarily coinciding with ours. But since we'd always regarded them as our real customers, that took a while to see."

Still, Intel *had* to start selling its 386 chips. Moore's Law decreed that the company must move the technology on to the next stage, or be stuck selling a product that was losing profitability with each passing day. Adding to the sense of urgency was the fact that Intel's engineers believed that the PC manufacturers who were their customers would themselves become obsolete, unless they made the step beyond the 16-bit chip in a timely fashion. If they did not, the market would simply move to other kinds of technology. "It began to dawn on us," says Dennis Carter, "that our only real hope was to appeal directly to PC buyers. If we could convince them of the benefits of 32-bit strength, they might start to demand boxes that ran on the chip. And if *that* happened, the buyers could in essence pull the market for us, forcing manufacturers to start using the 386."

The notion of reaching out to end users was revolutionary for a manufacturer of computer components, and would entail a complete realignment of how Intel positioned itself in the market. As it was, the

company had no links to computer buyers and no routes of contact for reaching out to them, since its sales staff was entirely focused on manufacturers. Intel had no relationships it could leverage, no credibility with the general public, no history as a consumer products company; it didn't even have an advertising agency at the time. Nor did Dennis Carter, as the President's Special Assistant for Technical Affairs, have the authority to undertake marketing microprocessors to the general public.

Going directly to the public would entail the kind of total reorientation that most large companies would be unable even to conceive of putting into practice. One thinks of the Detroit auto makers' initial response when the market began to reject its cars: they tried to cut costs so that they could reduce their prices, but for a long time continued making and marketing cars in the same old way. Reconceptualizing to whom a company sells means re-envisioning why the organization is in business, which calls into question its very reason for existence. Doing so in turn undermines the prestige of the chain of command, unsettles established turf, and exposes an organization to incalculable risk. However, the very crisis that Intel had passed through during the mid-1980s recession made possible the kind of radical repositioning that Dennis Carter had begun to believe might be the only way to save the 386SX. By radically opening up the company and creating a flexible structure that let resources flow toward problems, Intel had set the stage for webs to form at the company's roots.

Stop Doing What's Stupid

The problem facing most companies, according to Carlene Ellis, Intel's Vice President for Organization and a member of the sixteen-person Executive Staff, can be summed up fairly simply: "*You just have to find a way to stop doing what's stupid.*" That is, you must constantly question the utility of what is driving the organization—not only in terms of the present, but also in regard to what lies ahead.

Most people in organizations are far too concerned with maintaining the status quo to be able to do this—in particular, the people at the top. People become *invested* in doing what's been done, in defending its need to be done, because it justifies what they have been doing. This prevents them from questioning the basic underlying assumptions that lie at the root of their enterprise. They don't ask, should it be done at all?

That Intel persistently asks questions is due to an earlier baptism by fire. "You have to go back to 1985 if you want to understand why we were able to handle the problems around the 386," Carlene Ellis points out. "Intel had always been this growing, successful company. We were known for having a growing, stable employee base—we were a place where people stayed. And believe me, we benefited enormously from having such a low turnover, because only when people really know their way around can they figure out how to get stuff *done* here. So most of us assumed this was just the nature of our company. We took our stability for granted, without really having earned it."

Then, in early 1985, the whole industry "suddenly just went through the floor. Everyone got caught with a massive overstock of microprocessors, including us. It was a terrible crisis, we just couldn't sell our stuff, and to deal with it we had to let thousands of employees go. The company was just torn apart—great people thrown out on the street, very bitter. Those left behind were as scared as those who left. They couldn't concentrate on their work. The motivation was just gone. Fear was up as people waited for the next hit. Here everyone had all worked so hard to build up trust over the years, and now we were watching it be destroyed overnight. Seeing what happened scared us to death."

As head of CIS at the time, Carlene Ellis was in a particular position to feel the pain. She was sensitive to it because of what she had witnessed growing up in a small town in the South. "I remember like yesterday how NASA suddenly cut thousands of people from the space program. Huntsville, Alabama, just fell apart—the town, people's families. You'd see all these incredibly talented engineers walking

around doing nothing. I remember it gave me a feeling of terrible waste." At Intel in the mid-eighties, Carlene Ellis feared reliving that experience, and became convinced that "we were watching something that we could never let happen again."

Of course, layoffs had always been considered part of organizational life, a given; inevitable because the nature of business cycles is to expand and contract. "But what we realized in about 1985," says Carlene Ellis, "was that while that might have been all right for industrial factories—though I doubt it—it's *not* acceptable for a company like Intel. Whenever you have highly trained people, you're just shooting yourself in the foot when you have to fire them. *They* comprise the value of your company, so it makes no sense. Also, if you're going to ask people to be creative, you have to provide an environment that inspires them. People *have* to be motivated if you want them to think, and constant fear destroys motivation."

The lesson of the late eighties for Carlene Ellis, then, was that "layoffs are a last resort. They destroy your foundation and it's tough to rebuild. Once you make the commitment to try never to let people go, however, you have taken the first step toward reconceptualizing how your organization works." With support from the Executive Staff, Carlene Ellis's Human Resources department began in 1990 to formulate a plan so that "ideally, we would *never* have to go through layoffs again, no matter what the external situation. The fact that the economy was cyclical could not be used as an excuse." In order to achieve the goal, however, "We had to completely change the way we were thinking. We had to start looking at everything from the standpoint of where we were going to be in the future. We had to know what kind of skills we were going to need. Not just for the next year or so, but way down the road as well."

The goal became never to hire permanent people whose skills would become obsolete, or who would not be needed if and when the industry hit a downturn. "Once you decide to start thinking of it like that, you have to really start listening to people—your administrators, analysts, planners, designers. You have to find out exactly what *they* need, in terms of skills and support. You have to challenge them to

think about what their work will be like in the future, which of course gets them thinking about the company, and the industry, as a whole." This in turn drastically alters the role played by Human Resources, which is no longer in the position of simply trying to find good people and then hiring and training them in an all-purpose way. Human Resources becomes instead more the partner of the business units, prodding them to think in an integrated and large-scale way about what they will be needing over the long term.

Once people are hired, they must then be trained in a broader sense of skills, so they can perform a lot of functions and be shifted around with relative ease. "You can't afford to hire someone who can only function as a process engineer, for example. You have to train that person in design engineering as well. That means moving him around a lot, which therefore means he has to get his training while he's on the job. The whole trick to avoiding layoffs is that you have to be both lean *and* broadbased, having lots of utility people. When I think back to what I saw at NASA, I'm sure one of the problems was that everyone was trained very narrowly, for just one specialty."

Carlene Ellis makes clear that Intel's culture of constant reorganizations and broadbased training is not only a strategy for ensuring a work force that is flexible and lean, but also a way of building in a bias for the pragmatic and tactically-based approach. With jobs assumed on a provisional basis, and training conceived of as ongoing, people get used to trying things out and learning from whatever works. Such an approach, she points out, facilitates innovation by encouraging people to take responsibility for projects as a whole, rather than focusing only upon the part that they have to play. The emphasis on strategy built from tactics thus encourages large-scale thinking among people throughout the organization, by spreading responsibility and the opportunity to improvise around.

As a former school athlete, Carlene Ellis is fond of observing that Intel "plays by sandlot rules"—the stress is on working together, on learning and improvising within the context of play. "When I played basketball in college," she recalls, "I always hated the zone defense. You just stood there guarding, no matter where the ball was. Lots of

companies play that way today: the market moves or disappears entirely, but they're still standing there, guarding this empty spot. They do it because that's what they've been taught to do, and no one has thought to give them permission to stop doing something because it's stupid. But when you move beyond the zone, and start moving the ball, all you've got is this core of people, with everyone accountable and responsible, all over the ball. And *that's* where the technology has moved us. We don't have time to play the zones. It's all one-on-one out there today."

Weaving the Web

Intel's restructuring in the wake of the 1985 recession made it easier for internal webs to form by accentuating those aspects of the company that permit and encourage alternate centers of power to develop. But the recession also paved the way for what was to follow by forcing Intel to reorient itself, to question the bedrock assumptions of its enterprise. The depth and level of questioning about such basic issues as layoffs prepared the way for Dennis Carter to question just who Intel's customers really were, and in the process of doing so, to reinvent the market.

In early 1989, Dennis Carter went before the Executive Committee and told them he thought it was time to see if the 386SX could be marketed to end users. Because the company had a tradition of funding unorthodox experiments if they were tried out on a small scale, the Committee gave him $5 million to see what he could do—"five million dollars to change people's buying behavior across the U.S.," as he later said. His first and most obvious problem was that he had no staff, for the effort was not assigned to any department: it existed as an independent team, one of those one-on-one core units of which Carlene Ellis approves.

Dennis Carter's first step in weaving the web that would enable Intel to reach out directly to computer buyers was to draw on people from throughout the company, borrowing them from their various

divisions so he could cobble together the beginnings of a team. Creating impromptu teams for quick action is not as difficult at Intel as it might be somewhere else, because of the tradition of people working for multiple bosses. This kind of matrixing gets people used to flexible structures, and accustoms them to being moved around.

To work full-time in the new effort, Dennis brought in Sally Fundakowski, a former market researcher, since the first step would obviously be to figure out the market. "I had left Intel a few years before," says Sally. "I'd been bitten by the start-up bug and went off to start my own business, but the times were very tough. Then one afternoon, I was sitting in this pie restaurant in Palo Alto, just a week away from having my second child, when Dennis walked in with his kids. He started talking to me about his new project. He just got very excited about it, so I got excited just listening to him. Right on the spot I made the quick decision to go back to Intel and work for him."

As an entrepreneurial kind of person, Sally Fundakowski liked the idea of "doing something just unheard of, something that would completely redefine the market. Intel had always had this audience of a few thousand engineers, and now suddenly Dennis was thinking about ways that we could widen that to millions of people. There was this huge element of risk: we stood to really alienate the manufacturers and distributors we'd always sold to. We were going to be messing with people who'd always been *their* customers! All these elements came together and made the project so intriguing. It was absolutely a renegade kind of deal."

Sally's early market research was full of surprises. "Naturally, we had to find out what our customers thought about us, the end users we were going to try to reach. Well, the first thing we discovered was, they had no idea who on earth we were! We could hardly believe it—here we were so successful, but even MIS people in big companies didn't know us. Only fifty percent of *them* had even heard of the 286. So you can imagine how things stood with the general public."

Market education was obviously going to have to be drastic. "We realized right away we needed to do something very dramatic in order to change people's buying habits," recalls Dennis Carter. "But

whenever you do something dramatic, there's the chance you'll make some mistake and undermine yourself. Sally and I needed more experience before we could forge ahead, and to me you get experience by trying things out on a small scale, so you can learn from your mistakes without it costing too much money." Although Intel prides itself on taking risks, Dennis Carter also notes that "there's this other side of us that's very methodical. Don't forget, we're a bunch of engineers! So *when* we do something risky, we always proceed in small steps, gathering information and trying to measure everything as we go along. We don't just pick some strategy and then go ahead because we sound good when we talk about it to ourselves." Strategy must derive from tactics, in other words: tactics implemented at the grassroots level.

The team decided to test an appeal to the end user market in Denver. In preparation, Dennis Carter enlarged the web, enlisting Ann Lewnes, then on the staff of Intel's internal magazine. "If we were going to try to persuade people, we obviously needed someone who could write." Together with Sally Fundakowski, they flew to Denver. Dennis Carter recalls: "When we got to town, we had no network to buyers, very little name recognition. We had to start out by walking cold into retail stores. We just went in and struck up conversations with people who made a living selling PCs. Mostly, we asked questions: we were trying to get an idea of what their customers looked for, what the dealers themselves thought their customers wanted."

The retailers seemed intrigued that people from Intel would take an interest in their business. As the dealers began to ask questions, the Intel team began to coordinate a response. They developed programs to train the dealers in what 386 technology was all about. "This effort required us all to do a little of everything," says Dennis Carter. "We came up with point-of-sale displays and wrote backup material. We started focus groups of PC buyers, and listened to what they had to say. We interviewed people who planned to buy PCs, and asked them what they thought was important. Everything we did was about getting feedback, creating a loop, an interface so we could listen to the market."

Next, they hit the local media. They got themselves booked onto Denver radio shows, and even put up a billboard advertising the 386SX. Most important, they monitored everything, so that every effort, even if it failed, would supply information and so function as research. Following up on PC buyers after the information blitz, the team discovered that people were beginning to alter their purchasing plans in response to what they were learning about how 32-bit technology could be of use to them. "People in Denver were starting to tell dealers they wanted 386 capacity in their new computers," recalls Dennis Carter. They wanted to be able to run the programs they might need in the future."

Judging the Denver effort to be a success, the team decided to expand the approach, trying it out in twelve major metropolitan markets, but formulating a slightly different approach in each, so that they might learn as much as possible from their efforts. To cover so many markets, of course, more than the core of three people would be needed, so Dennis Carter turned for help to Intel's sales force. This huge international organization had been designed precisely in order to sell Intel's technology to manufacturers and distributors. That's where the sales managers' relationships and thus their loyalties lay. Quite predictably, it was at this moment of expansion that the team encountered its first resistance within the company, for their effort to borrow sales people for their project stirred a lot of flak.

Dennis Carter recalls: "Some of the area sales managers couldn't believe it—'you want to take *my* people for *your* little program?' They were particularly worried that, by going directly to computer buyers, we were going to alienate the original equipment manufacturers, who had of course always regarded the buyers as *their* customers. But finally, we were able to persuade them. We convinced them that, if their sales people got into contact with actual PC buyers, they would learn a lot of stuff that they could then turn around and share with the OEMs. We pointed out that what we wanted to do would actually *improve* the sales force, instead of just distracting them from their jobs, by expanding their reach and building up their networks."

But was persuading the area sales managers of the advantages of his project the only reason the team succeeded in its task? Wasn't the power that Dennis Carter held as Andrew Grove's special assistant also useful in persuading field sales managers to agree to lend him their people? "I have to say that, while it may have helped a little, it was not a primary reason," he maintains. "Leveraging power that way doesn't work very well around here. It spurs resentment, makes people resist you, and then you have problems when you have to deal with those people down the line, which in a networked company like this you always do. Plus I can honestly say that being in a high position at Intel doesn't mean as much as in other organizations." Dennis Carter adds, echoing Ted Jenkins: "Positional power at Intel means as close to nothing as you can get."

Widening the Web

In the process of expanding its effort to reach computer buyers in twelve major metropolitan markets, Dennis Carter's team had to vastly expand its scope, yet the core of people at its center remained very small. The evolving web also remained mutable and flexible, for the nature of the work kept changing as new tasks needed to be done. For example, Ann Lewnes, who had been brought in because of her writing skills, came up with the idea of starting an advisory board of Fortune 500 MIS directors. Intel would share information about what it was doing with these people under nondisclosure agreements, while they in turn would help Intel get a better idea of exactly what business users were going to want from their technology in the years ahead.

Ann Lewnes's effort, undertaken on her own initiative, proved valuable not only because of the information it developed, but because it provided a mechanism for developing ongoing relationships where none had existed. Learning from the success of this improvisation, Ann Lewnes then expanded her efforts, setting up first an advisory board of PC dealers, and then a network of people who were involved in various PC user groups. As her work with the advisory

groups grew more demanding, she dropped other aspects of her tasks, evolving in the process a whole new job for herself.

Ric Giardina, an Intel lawyer who would later join Dennis Carter's team, points out that this sort of improvising has a long tradition at Intel. "You might find yourself on a multidisciplinary team that's doing something really new, something completely different from your regular divisional work. As you get more into it, the new work starts to feel more important, and you realize that your regular divisional job is interfering with what you're trying to do. So you go in and tell your divisional head you don't really have time to do your regular work anymore—he or she will listen, and more than likely let you go. At other companies, this would set off a big turf war, with your boss and the team leader both fighting for your time. What makes Intel different is that people actually care about what's best for the company as a whole. Plus most people here have worked in lots of different jobs inside the company, so it's hard to get stuck in the turf mentality."

As swat teams of sales people were assigned the task of developing specific markets for end users, the original core of people in Dennis Carter's web found themselves doing less execution and more training. At this point, Charlene Hama was drawn onto the team to coordinate the training. "We got Charlene involved," says Sally Fundakowski, "because she knew all the key people in field sales, this huge organization spread out all over the world. She's one of those people at Intel who's been around the place so long that she always knows who you need to bring in when you want some help." Charlene Hama says: "My expertise was with the field sales groups, and also with our major customers—I'd been in a group that worked directly with the OEMs. Plus, I had production experience, so I knew the people in the factories and the warehouses." In Ted Jenkins's definition, Charlene was someone whose strong relationships helped to counterbalance the effects of positional power within the organization.

. . .

The first national declaration that Intel intended to reach out to computer buyers came when the company ran a series of advertisements that became known as the Red X campaign. Dennis Carter's team worked with a small agency in Utah to develop an ad for general interest and business magazines. These were considered an unlikely venue for Intel, but the best way to build fast recognition for 386 technology among computer users outside the major markets where the swat teams were at work.

The Red X campaign announced in no uncertain terms that the days of the 286 microprocessor were over. The era of the 386, of "32-bitness" and massive upgradability, had arrived. The ad was clean, simple, and dramatic. Premiering in *Business Week*, the two-page declaration created an immediate sensation. "People were horrified," recalls Dennis Carter. "They thought we were insane to announce that our own most successful product was obsolete. But we *had* to do something strong to get attention. And we certainly succeeded in that —there were editorials all over the place. *USA Today* actually ran one on the front page, denouncing what we had done as stupid."

What *USA Today* and the other editorialists were overlooking, of course, was that Intel was being driven to redefine its market by the relentless logic implicit in Moore's Law. For if the economics of high technology require that any given product must begin losing profitability as soon as it hits the market, then manufacturers must do the unthinkable and help hasten the demise of their own products *in proportion to how successful those products prove in the market.* Still, Intel was taking a gamble. Would the public feel manipulated by the company's open declaration that the technology it had been selling was out-of-date? Or would people be so persuaded of the advantages of the 32-bit microprocessor that they would overlook the manipulation?

Because the swat teams had established new lines of communication with PC buyers and dealers in major markets across the country, Intel was able to start getting feedback on the campaign with virtually no delay. "We had built up this great intelligence network," says Sally Fundakowski. "Within just a couple of weeks, we knew the ad cam-

paign was having an enormous impact. People all over the country were beginning to change the way they bought PCs. They were becoming more sophisticated and demanding, thinking in terms of their future, as opposed to just their present, needs." The change was in some ways comparable to what happened in the 1960s when consumers began thinking of their audio systems in terms of upgradable components. That spelled an end to people walking into stores and simply asking for a "stereo," and then settling for a name brand because it was familiar, even though they had no idea of the quality or what its speakers could or could not do.

Both the swat teams and the Red X campaign proved successful in drawing attention to the new 32-bit technology, and computer users were soon pulling the market in its direction. In addition, the fact that Intel manufactured integrated circuits was becoming known to the general public, a recognition which would prove indispensable in the years ahead. Still, the very success of the end user marketing project was inadvertently sowing the seeds of a potential long-term disaster. For without quite being aware of the danger, Intel was building awareness for the value of the 386 microprocessor rather than for the company itself.

THE MEANING OF CLONES

By the summer of 1990, Dennis Carter's initial web had succeeded in its objective: making the 386 chip as successful as the 286 had been in its day. "The whole world was 386," as people at Intel had begun to say. But by the late fall, a couple of smaller Silicon Valley ventures—Advanced Micro Devices, Cyrix, Chips & Technologies—had figured out how to approximate the workings, though not the design, of the 386. Within months, they were selling these "imitators," as they are called, at far below what Intel was able to charge, considering that the company had to recover the costs of developing the chip in the first place. As a result, over the course of the next year, Intel would lose nearly *half* the busi-

ness it was doing on the chip that it had managed, after a large investment and the brilliant repositioning of its entire marketing strategy, to make the mainstay of its enterprise.

The imitators in no way tried to disguise that their products were modeled on Intel's; on the contrary, they announced it by incorporating the number 386 as part of their names. After all, Intel had poured the full range of its tremendous resources into making the number recognizable among computer users: why shouldn't the imitators try to benefit from that? And so it was that Intel, the market leader, found itself in a situation similar to that of IBM in the early eighties, when, after investing hundreds of millions in the development of a personal computer, it had to stand by and watch its market being taken away by IBM clones. As IBM had, Intel took its competitors to court, feeling it had an even stronger case, for the use by the clonemakers of the actual 386 number seemed a particularly clear infringement upon Intel's trademark.

Clones, or imitators, as Intel prefers to call them, are a phenomenon unique to the post-industrial world, which is why the word clone was never used until recent years. Knockoffs have always existed, of course, but in fact they are not clones, for a knockoff mimics only the outward *appearance* of an original, and usually does not do that with much sophistication. Because a substantial proportion of an industrial product's price is determined by the cost of raw materials and labor, a low-cost imitation is easily discerned. A Jaguar knockoff that uses a mass-produced engine with plastic parts instead of one assembled by hand from tempered steel is not a clone; nor is a laminate veneer cabinet that follows the lines and design of one fashioned from solid walnut. Any low-priced imitation of an industrial product must rely on low-priced component parts and shortcut labor, and thus is always compromised in obvious ways.

By contrast, a clone works in a way that mimics almost exactly the workings of the original product. As such, it can exist *only* when development costs are high but production costs are low. In microelectronics, the true cost of a product lies not in the raw materials that comprise it; sand, the substance of silicon chips, is always cheap. Nor

is manufacturing costly, since computer-aided processes do most of the work. The real value of high-tech merchandise lies almost entirely in the cost of the knowledge that has gone into the fashioning of something that has never before existed in the world. The price for this knowledge is all paid up front, during the research and development phase, which is why high-tech products are expensive to invent but cheap to reproduce. It is this anomaly in pricing, in fact, that accounts for Moore's Law; because costs are low downstream, profits evaporate.

The challenge for the would-be imitator of a chip lies in discerning how the original is made; this is usually achieved by a process of reverse engineering. Starting with the close observation of how the original works, the imitator then *reasons backward* to discover what set of instructions might achieve the same results. The copyist can then approximate the encoded message that transmits the information on the original chip; the message need not be exact, so long as it *does* the same thing. Once an engraving has been made, a nearly exact copy of the original can be devised using the same inexpensive materials. And just as long as the operation rather than the code is imitated, the cloner is not necessarily in violation of the original producer's patents or copyrights.

Though unforeseen at the time it was formulated, the development of the clone lay implicit in the reverse economics of Moore's Law. And it is because of these reverse economics that high-tech companies like IBM and Intel are so swiftly punished for an inward focus that neglects the customer. IBM was brought low by its inability to define its customer precisely, and its unwillingness to learn from the webs that configured within its midst—in particular, the web that developed the PC and was then promptly reintegrated into the larger bureaucracy. Intel, unhindered by the bureaucratic legacy of the Industrial Era, appears to stand a greater chance of surviving the challenge posed by the imitators, for it has begun to incorporate the way of working that Dennis Carter's team improvised into the larger strategy of the organization. What Sally Fundakowski calls "the webster skills" that the group developed are now enabling the company to

respond to the potential disaster that resulted from the triumph of the 386 marketing campaign.

The loss of nearly half of its market for the 386 microprocessor in 1990, though shocking, was only the start of Intel's problem with imitators. By the following spring, word was out that the copyists were only a year away from being able to imitate the 486 chip—a product that Intel would not even be introducing until that fall. It had taken the clonemakers nearly four years to figure out how to copy the 386; now, with that time on the verge of being drastically cut, the cost of producing the imitator chips would rapidly decline. As the chips grew cheaper, the incentive for original equipment manufacturers—Intel's old customers—to buy them would grow more intense.

Intel *had* to respond; the question was how. The manufacturer of products that are being cloned does not have many options. Since the company must recoup its research and development costs, it can never compete with the imitator on the basis of price. One of the few tactics open to the originator is to speed up product cycles, continually spawning new products at a rapid and unrelenting pace. This draws clonemakers into a perpetual game of catch-up: by the time their clones are ready for market, the products upon which they are based are about to become obsolete. In this way, the original manufacturer can hang on to its markets, but the cost is enormous, since its spending on research must proportionately increase.

Despite the dangers, in the early winter of 1991, Andrew Grove, declaring that "speed is all we have," announced a drastic program to shorten product cycles. Instead of waiting until one generation of chips was ready to bring to market before starting work on the next, Intel would develop successive generations almost simultaneously. Entirely new families of chips would be introduced every two years, some with as many as thirty variations, as a way of keeping the clonemakers at a perpetual disadvantage. In order to achieve this level of efficiency, the company would have to accentuate those aspects of its operations that emphasized coordination and cooperation. And so

the web of inclusion that had configured in its midst would serve as a model.

THE WEB EVOLVES

Taking clonemakers to court, speeding up product cycles, and cutting prices were all defensive moves, and Intel took them. But the company had also to thrust decisively forward. This meant finding a way to convince customers that there were concrete advantages to buying Intel products, in terms of quality, reliability, and service—and doing so within the framework of the company's new definition of its customers. As had been true for 286 technology, computer manufacturers had no strong incentive to buy the premium-priced Intel chips unless computer buyers demanded that they do so.

Thus it soon became apparent that the web configured to reach out to end users had only begun its work. As Sally Fundakowski noted, Intel not only needed to create an identity for specific products; it also had to begin to do so for *itself*. In effect, this meant finding a way to represent itself to the general public as a premier manufacturer of what were essentially consumer products. Casting about for any kind of precedent in such a marketing attempt, Dennis Carter could find only one instance in which Intel had achieved anything like this kind of recognition. It occurred in Japan, where the subsidiary Intel Japan KK had launched a kind of corporate identity campaign.

In the Japanese market, curious and informed technology customers are eager to know precisely what components comprise the products that they buy. In order to inform them, Intel's Japanese subsidiary had encouraged the computer manufacturers who used its integrated circuits in that country to publicize the fact in their advertising. And so the rather awkward slogan "Intel In It" was affixed to ads for Japanese computers, English slogans having great cachet among Japanese consumers. In traveling to Japan, Dennis Carter found that even in the country's public transport system, colorful banners boasted of Intel's name. By piggybacking onto manufac-

turer's advertising, the company had become widely known without a great expenditure of money.

That this could be done rather easily in Japan reveals how essential aspects of that country's attitudes toward antitrust laws encourage cooperative ventures in a way that remains impossible in the United States. U.S. statutes make it difficult for companies that source or supply one another to achieve any communality of interests, to share advertising or promote one another's products. In Japan, similar laws exist, but are rarely enforced, because they conflict with the nation's deeper culture of encouraging and promoting long-term relationships. Intel Japan KK could permit some Japanese manufacturers to use its name without fear that other manufacturers would sue it for showing favor, because companies in Japan consider it disgraceful to take suppliers—or partners, as they prefer to call them—to court.

Still, Dennis Carter felt convinced that persuading U.S. manufacturers who used Intel components to advertise the fact would be the best way to establish the company in the public imagination. And so in February of 1991, he proposed to the Executive Staff that Intel offer a cooperative advertising deal in order to persuade the OEMs to make use of Intel's name. "I had no idea what they'd think," he says. "It was taking the end user marketing idea to the extreme, actually using the manufacturers to sell Intel to the general public. It was revolutionary and risky, but Andy Grove just looked at the plan and said, 'So, let's get started on this tomorrow!' "

By this time, End User Marketing had evolved into a whole department, with Sally Fundakowski at its head. In configuring the new web, Dennis Carter relied upon her and her staff, but gave the team a new shape to fit its mission. Once again, he had to borrow people from throughout the company, people who had flexibility in regard to their time. His first recruit was Pat Perry, who had previously been involved in training field sales engineers to work with OEMs. She had good contacts among the OEMs' marketing forces, and was also available for an assignment; her old job had just been reorged, and she was preparing to take a long sabbatical in the spring.

"I was at loose ends when Dennis called," Pat Perry recalls. "He

was all excited about trying to do co-op advertising with our OEMs, which meant that they would put our name in their ads. The whole thing sounded strange to me—I figured, what was in it for the OEMs? Why should they use their ad dollars to promote an integrated circuit? But Dennis kept saying, *we're* the most important ingredient in a computer. When someone buys Dell, they're also buying Intel. And if they know we're the best, that can only help Dell."

Cindy Tsuyemura soon joined the group. "I came from marketing and communications," she explains, "but over the years I had developed this specialty of knowing about trademarks. I'm not sure how it happened—I had just hung around the legal department a lot, picking up bits of knowledge. Because I knew something about the subject, I saw early on that there had been problems in how we'd handled the 386. While we got recognition for the product, we didn't get any for Intel—we weren't *branded* as a company, as trademark people say. We did a good job of reaching out to the end user, but we hadn't realized all that was involved in marketing to the public. We were still in the learning stages. That was the basic thing about the group, we learned from our work as we did it."

Just as the new team members were starting to test how the OEMs felt about the co-op advertising idea, Intel's trademark suit against Advanced Micro Devices was rejected by the U.S. District Court in California. "Losing the trademark made it seem as if our campaign to develop awareness for 386 technology had been an absolute disaster," Sally Fundakowski says. "AMD and Cyrix were going to be the ones to benefit. So suddenly, the work our new team was doing seemed ten times more important than it had the week before. We had to start getting people to think of *us*, not our specific products —even though we'd just spent five million dollars getting them to think in terms of the 386!"

When the trademark was lost, Ric Giardina was pulled into the web. Ric had joined Intel only the year before, but had already determined that he wanted to change the way the legal department operated. "When it came to legal, the company was still too compartmentalized. There was no integration into the overall business process.

The business people made decisions, and then sent things down to us lawyers to check. We were the gatekeepers, the people who said no, which of course made everyone in the rest of the company resent us. It was like old-fashioned manufacturing, where you wait until the very end of the process to check for flaws."

Ric Giardina was already looking for ways to change the process in his own department. He had no mandate to do so, and, being new, not much positional power; still, he was determined to make a difference. That was why he had come to work at Intel in the first place; he had seen it as "the kind of place where you could create something on your own, be imaginative, really leave your mark." Now, joining Dennis Carter's group, he was being given a mandate to integrate legal and business processes within the context of a concrete situation, rather than first figuring out a strategy and then testing it. "We had this excruciating time element," Ric remembers. "We'd been hit by the clonemaker crisis, and we had failed to keep our trademark. That forced us to improvise, to learn as we went along." Ric now believes that the true utility of flexible web-like structures lies in their ability to integrate functions, and do so in a way that enables people to learn new skills in the process of expanding their jobs. Inevitably, because webs form around innovative projects, both the learning and doing are done under fierce constraints of time.

Intel Inside

The newly configured web agreed that the phrase "Intel In It" sounded awkward in English, and decided instead to offer the slogan "Intel Inside" to computer manufacturers willing to participate in the new co-op advertising program. The arrangement would be similar to that pioneered by NutraSweet and Coca-Cola, under which NutraSweet pays a portion of Coke's advertising costs and Coke features NutraSweet's name in its ads and on the Coke bottle itself, effectively making the soda an advertising vehicle for the sweetener.

The advantages of such a scheme would cut two ways for Intel

and the computer manufacturers who participated. The computer makers would cut their ad budgets by getting Intel to subsidize a portion of their costs, and would also benefit from the implicit message that its internal components were of such high quality that they were worth advertising in themselves; no company was about to advertise that it was building computers based on clones. Intel in turn would garner vast recognition from the mass publicizing of its name, and would also establish its components as *the* quality product. As with NutraSweet, Intel microprocessors would become identified in the public mind as the premium article, the original, "the real thing."

The Intel Inside slogan would be represented as 

. Ric Giardina notes that "All of the specifications had to be exact, the size of the letters, everything, in order to maintain the integrity of the trademark." Once the symbol had been agreed on, the team had to go out and sell it to the computer manufacturers, a task made far easier by the lines of communication established by the earlier web. Sally Fundakowski recalls how the people at IBM immediately loved the Intel Inside slogan when it was proposed to them at a meeting in early 1991. "They asked us to get the program together in time for the spring campaign for their new personal computer, which was set to debut with a full-page ad in *The Wall Street Journal.* Of course, that sounded fabulous, but it was already the end of February, and the ad was set to run on April 22!"

The problem lay in complying with U.S. antitrust legislation. In order to offer the co-op advertising program to IBM, Intel had to make precisely the same offer to all its customers before the deadline for *The Wall Street Journal* ad. Says Sally Fundakowski, "Here we had just under nine weeks in which to develop the program, write the guidelines, do all this meticulous legal work, and then notify everyone in the world of what we were doing! And when I say everyone, I mean all the computer manufacturers who bought our chips, plus all the distributors of their products, plus all the circuitboard makers who sold to either. Some of these companies were very small, maybe two employees working in one outlet somewhere in a suburban mall. We

barely knew who they were, or how to find them. But we had to track them all down and then make them all the same offer, or else let the IBM thing go."

Ric Giardina recalls: "Our team had to do everything at once. There was no time to devise any particular structure. We organized ourselves at weekly GYATs—that's the Intel name for unstructured meetings—it's short for 'get your act together,' and it implies *right away*. For the Intel Inside program, our GYATs would usually last three or four hours. We'd come together, decide what had to be done, and people would volunteer to take care of this or that. Then we'd go off in our own directions and work like crazy on our assignments, and come back and make a report at the GYAT the next week. It was all improvised, and we managed the process ourselves as we went along."

In management-by-GYAT, any semblance of specific job descriptions broke down. Everyone in the web assumed a wide variety of tasks. "It didn't matter whether someone came from marketing, communications, finance, training, or sales," says Ric Giardina. "Everyone did a little of everything. I was writing scripts for Andy Grove to do video presentations for the OEMs. I was selling ideas to the sales force, I was managing the business end—most of the time, you'd never know I was a lawyer." Sally Fundakowski adds, "We had no time to treat training as a separate part of what we were doing, because what we were doing was completely new. We had to train as we were learning, which meant that we all became trainers, teachers really. As we made up the process, we tried to impart what we learned."

Dennis Carter had formulated the strategy and championed it with the Executive Staff. But as the emphasis shifted to implementation, his active involvement diminished. Says Cindy Tsuyemura. "Once we started, I seldom even saw Dennis. He was the big-picture man. He knew how to impart an idea and then leave people alone. We had no time for formal reviews—if we needed something from Dennis, we just grabbed him in the hallway or the cafeteria and told him about it." Sally Fundakowski concurs. "Dennis was more a mentor than a boss. He didn't involve himself in the everyday workings of the

group, or supervise us in any sense. Mainly, he set the parameters for what we were trying to do and offered guidance on specific problems. He was also our advocate, our godfather in the company. He got the Executive Staff so excited about our project that it became the key to the company's whole marketing strategy. That helped us commandeer the resources we needed."

Commandeering resources was crucial. For one thing, co-op advertising involves huge amounts of money—Intel was splitting the costs on an enormous campaign. Also, the web, in order to function around a small core of people, had to make large demands—on the legal staff, the marketing department, and the sales force. Commandeering resources also meant commandeering time, drawing people from throughout the company as they were needed. One major characteristic of the Intel Inside web was its flexibility—it expanded and contracted to suit specific needs. The core of four—Ric, Sally, Pat Perry, and Cindy—grew to eight or even twelve, and then contracted again, depending upon what needed to be done. Some of the core members still retained other responsibilities. Says Ric Giardina: "I was still supposed to be supporting the software organization with legal work—that was my divisional job. But I was spending all my time with Carter's team. So after a while, I told my division head that I didn't have time for my regular job, and he let me go."

As customers were located and backup materials developed, Dennis Carter stepped back in; together with Pat Perry, he made the presentations on Intel Inside to the company's major customers. Recalls Pat Perry: "Our goal was to get maximum feedback from our biggest customers as soon as we could, before going full-bore ahead." Based on reactions from customers like NCR and Dell, Pat then began training the sales force to make more presentations. Legally, Intel was obligated to offer the co-op ad program worldwide, in Europe and Asia-Pacific. "I was key there," says Pat Perry, "because I had great worldwide contacts. That came from my being in corporate sales and marketing for seven years." As Ted Jenkins noted, the stability of Intel's workforce and the fact that most people have held a variety of positions were useful in widening the web's pool of contacts.

As the deadline for *The Wall Street Journal* ad approached, Janice Wilkins, a controller and administrator, joined the Intel Inside web as Program Manager. "I came in at the height of activity," she recalls. "We were learning very rapidly, everyone doing a little of everything, but none of us realized the potential scope of the program. We thought we had about five hundred customers, and we had somewhere in the three thousand range! We also didn't realize how eager people would be to participate—acceptance was quick and eager, which made things even more chaotic. My role was to structure that chaos, to try to set up orderly procedures, and to make sure our assets were protected."

A number of times, Janice Wilkins pushed to bring in an outside consultant to give the web a reality check. "But the team vetoed it. They felt it went against Intel's culture—it's the *norm* here to trust your gut and take your chances, and they didn't think an outsider would understand that. I had confidence in them, so I backed off." Janice Wilkins admits that, as Program Manager and someone who was used to looking after the company's money, she was less comfortable with improvising than the others on the team. "But that was part of my role. If the effort was really going to be successful, we were going to have to get beyond the improvising stage. For one thing, there was so much money involved!"

The Intel Inside web managed to notify all the company's customers in time to permit Intel to participate in IBM's *Wall Street Journal* ad. After it appeared, other computer manufacturers began expressing strong interest in joining Intel's co-op program. According to Janice Wilkins, "Seeing our logo in print really made other customers want to sign up for the program. That was much more persuasive than getting a letter from us. So very quickly, Intel Inside began to take off. It was something people wanted to be part of."

By the end of the summer of 1992, the company's cash was flowing into co-op ads that appeared in mainstream newspapers and business magazines; within months, "Intel Inside" had become a mark of quality recognized by computer buyers. In the spring of

1993, the campaign was extended to television, and soon the company was moving ahead with a co-op program to affix Intel Inside labels on the boxes in which its customers' computers were sold. Thus had Intel developed an entirely new approach to marketing that had transformed it into a high-tech consumer products company with a strong identity among and direct ties to the general public.

In the process of effecting this transformation, the Intel Inside web had created a continuum of links that fulfilled Regis McKenna's definition of "evolutionary" marketing as "marketing that integrates a company's customers, sourcers, and suppliers into a single system, a coherent process." Only by achieving this level of integration, which truly recognizes a commonality of interests, can an organization hope to "own its market," McKenna points out. Owning the market means defining it, setting the standards for its operation, and expanding or narrowing it in order to suit the organization's evolving needs. Only by owning its market can a company hope to achieve the kind of substantial earnings that enable it also to take the leadership role in research and development.

As McKenna also points out, Japanese companies over the last two decades have been particularly successful in achieving ownership of their markets through use of *keiretsu*, those clusters of affiliated companies that band together for mutual advantage. The acceptance of interrelatedness implicit in the *keiretsu* structure has given many Japanese companies their edge in pricing, flexible supply, and service, the accent on relationships being the key to survival in today's complex and interrelated world. The individualistic heritage of many American organizations—a heritage reinforced by our outmoded antitrust laws—has tended to work against such cooperation, leaving U.S. companies to find other strategies for transcendence. The evolving web that grew out of Dennis Carter's early efforts to reach out directly to computer users helped the company achieve this kind of transcendence, strengthening its market ownership in the face of imitators. In effect, the web created an inclusive feedback loop among

Intel and its customers and suppliers that replicated the essentials of the *keiretsu* structure.

"The Process of Change Is Not like an Ink Stain"

Once the co-op advertising venture had been established, the Intel Inside web began its inevitable evolution into a full-fledged program, administered and structured along more conventional lines. The days of four-hour GYATs were over, and those who had formed the very core of the web began to assume other roles, though their work had transformed not only the company's notion of why it was in business, but the nature of the team members' jobs as well.

Ric Giardina, having given up his divisional job, set to work on a multidivisional team whose mission was to assure that naming and branding was integrated into the product development process, instead of being tacked on at the end. The work he did in the web transformed him into a lawyer with an acknowledged specialty in trademarks and copyrights. Cindy Tsuyemura, who now reports to Sally Fundakowski, spends the majority of her time with Ric, having also developed her expertise. Pat Perry took over the network of corporate MIS directors that Ann Lewnes had originally set up. Under Pat, the informal effort has become a worldwide program with ten full-time employees that works with technology experts at all the Fortune 500 companies. The unit serves both as a resource for research and development, and as a means of contact between Intel and major technology customers. Charlene Hama put her connections at the factories to use, overseeing the effort to put Intel Inside stickers on computer boxes. And Dennis Carter moved from being Andrew Grove's special assistant to the newly created position of Vice President of Corporate Marketing, from which he guides Intel's effort to reconceptualize itself as a presence in the consumer market rather than a maker of high-tech components.

"The process of change is not like an ink stain," Ric Giardina reflects. "It's not something that starts in one place and then spreads

all around. It's more like a lot of little splatters that keep getting bigger and bigger, and then some of them come together and coalesce." He views the Intel Inside effort, the Red X campaign, and the early attempt to reach out to end users as such splatters: the way they came together changed Intel's very notion of why it is in business. He points out that Intel has always had a tradition of task-oriented teams, but believes that the inclusive and permeable structure of the more recent webs has taken that propensity much further, encouraging a level of integration that has made the company more web-like, more inclusive and permeable as a whole.

The blurring of job descriptions, the nonhierarchical way of assigning tasks, the total dedication of the team: all these aspects of the Intel Inside effort made it comparable to what occurs in high-reliability organizations when they are confronted with stress. Although such organizations tend to be profoundly hierarchical in ordinary circumstances, the chain of command dissolves when tensions run high and physical danger becomes a factor; then everyone works together as specialists on an equal footing in an intensely collegial atmosphere. One of the challenges for business organizations is to find ways to sustain this process when mortal, physical danger is not a threat. The Intel Inside web managed to achieve this because the larger organization is geared toward giving people an extraordinary measure of flexibility and independence in normal times.

Cindy Tsuyemura captures the essence of what it is about Intel's culture that enables rapid and flexible response. "Certain things were very important to our team's success. To begin with, all of us, while we are very much individuals, also share certain qualities in common. We are not just experts in one area, but are knowledgeable about Intel as a whole. We've been around, worked for lots of people, so we know who to go to to get what we need, in terms of resources, champions, trainers, information, technology. Plus, we're all the kind of people who don't have preconceived ideas about what we'll do and what we won't: we'll stuff binders, draft a document, drive a customer to a factory. Our attitude is always, just get the job done. We don't worry about who does what, or who gets the credit, because we

aren't always looking over our shoulder, wondering if we're pleasing our boss."

Cindy believes that total team efforts work better at Intel than at most companies—"certainly better than anywhere I've ever worked" —because the company makes an effort to hire people who are strong, assertive, and opinionated. "Most organizations *say* they want strong people, but they don't know what to do with them. What they're really looking for is people who'll go along. They think go-along types will be better at teamwork, but this isn't true, because people who don't have strong beliefs don't have that much to contribute. They lack a sense of urgency, of commitment. Here at Intel, there's a mystique around individualists, people who are very vocal and verbal, people with strong opinions about how to get things done. These are the only kind of people who'll fight for a project, do whatever's necessary to get it through. Intel looks for that kind of person in the first place. Then also, they know how to keep them. They understand that strong individuals need to be left *alone,* need to work the way they want to, instead of always being questioned or forced to give an accounting. When you're free, you can move quickly, which is a great incentive to assertive people. In my experience, assertive people won't stick around if they don't feel free to *move."*

As success transformed the "renegade effort" that so attracted Sally Fundakowski into a full-scale co-op marketing program, the creativity that had characterized its evolution had its effect on the company as a whole. But what about the program itself? Would it remain flexible and creative now that its responsibilities and purposes had been spelled out? Certainly, that fluidity was tested in December 1994, when the Pentium Processor crisis hit and waves of customers began demanding replacements because of a flaw that turned up in an obscure algorithm. Intel was unprepared for the intense publicity that discovery of the flaw occasioned, which resulted directly from its focus on marketing to consumers. Ric Giardina and other "websters," as Sally called them, were pulled together on a multilevel team that

met twice daily for six weeks. Their decision to replace the processors on demand seemed to satisfy the press and the public, though ironically doing so will probably only strengthen Intel, since its imitators will hardly have the budget to offer to replace minor flaws in the future.

The real question for Intel Inside remains, what will happen as the crisis recedes and the program becomes institutionalized. Carlene Ellis, from her position as Vice President of Organization, worries about it. "I've been on projects," says Carlene, "that were done very much on the wing—flexible, innovative, everyone working together with tremendous focus. But then they grew and grew, and suddenly you couldn't see the outer limits: you couldn't get your vision wrapped around all that was going on. In a way, the whole issue with teams comes down to a question of peripheral vision: how can you grow a project in such a way that you can still see its outer limits—or beyond? Because when a project gets too big, your vision starts to scatter at the outer edges. And people don't really feel like a part of something if they can't see it whole."

This problem of growth is exacerbated when the way a unit works changes in response to its size, Carlene has observed. "The real disjunction arises when what has been a step function goes linear. A web operates by steps, by jumps—there's no fixed process yet. You're developing your process as you go along, which means you're on a learning curve all the time. But what if the web needs to double or increase to three times its size? That's not a natural act." Carlene reverts to her basketball metaphor. "It all comes down to, how do you change from basketball to football? When you're in the web, you're playing NBA rules, improvising. Then all of a sudden you've got to expand, so you have to put in processes and controls. You get a quarterback, and suddenly everyone's role is defined—who can carry the ball, who runs interference. Those sort of definitions break the web apart: the cohesion of the small group is gone. You're back to bureaucracy, which is about definition. You move from learning to training."

Carlene thinks that "the answer may lie in how the web is spun,

by which I mean integrated into the larger whole." If the organization of which the web is a part is itself fluid, the web can send out new radials and axes as it grows, retaining flexibility and subdividing into manageable size. "The key is to keep change a constant throughout the larger organization, so process is always being improvised. And I see that starting to happen in organizations now. The technology is pushing us in that direction. The speed of the technology demands you constantly innovate, and that in turn pushes you to improvise. So the old quarterback-style division of labor becomes obsolete: the rules of football don't allow for much improvisation!

"I sense this profound change coming in how people are going to be doing their work. It has to do with building innovation into everyone's daily process. I see it happening at high-tech companies here in the Valley, although it doesn't have strictly to do with high tech. It's more the fact that the technology is forcing us to perform all our actions in real time. People have real-time information to respond to —it's right there on the screen—which means they have to react to situations as those situations are taking place. We all saw it happening with Desert Storm: real time drove it, you could watch it unfold, and everyone in the field had to react, to improvise their responses. I do think this is why the metaphors we're starting to use now—the web, and I also like the amoeba—are all organic images. Real time forces you to organize structures that are more reflective of how life actually works. And once we start reflecting life, we have to let go of all those false barriers that were built in when work reflected the machine. Real time means that nothing can happen behind closed doors, because everyone has access to information. In our organizations, we're moving toward the essence of participatory democracy."

could not keep huge inventories on hand, and had to develop a more flexible system. Similarly, the web of inclusion offers organizations the means to create what might be called "just in time learning." Such learning would be specifically tailored to hone the skills of people in an organization in the course of performing their daily work—and to do so continually, flexibly, and in real time.

Culture and Tradition at Anixter

A great place to watch the paradox of an entrepreneurial company trying to make sophisticated training part of its process is at Anixter Inc., a global networking and cabling systems specialist headquartered in Skokie, Illinois. The organization has a colorful history, defined by a driven and independent sales force in which everyone runs his or her own business as an entrepreneur. Anixter has made every effort to keep this individualistic culture intact during an extraordinary period of growth that has taken it from $385 million in sales in the mid-1980s to $1.5 billion in 1993, a fifteen percent average increase for every year. Keeping what is best in its culture has been a particular challenge, given that the fast-growing company has had to hire people at a rapid rate.

In contrast to, for example, Intel, which has its roots in Silicon Valley culture and has been on the cutting edge of post-industrial technology from the start, Anixter began as a family-owned enterprise in a resolutely Second Wave kind of business run on a shoestring in the gritty Midwest. Nevertheless, having from the start identified its purpose as the fulfillment of *customized* wants rather than mass orders, it has positioned itself well for an age that puts an increasing premium on products and services tailored to specific needs.

The company was founded in 1957 by two brothers, Bill and Alan Anixter, who grew up on the west side of Chicago; their father was a boss in the Democratic machine who had lost all his money in the depression. Theirs was a tough world, familiar from the novels of Saul Bellow, in which people prided themselves on having street

people who report to those same vice presidents. And because the *Herald* building is primarily horizontal, its corridors provide space for random encounters, which helps inspire familiarity across levels. Nevertheless, the profoundly compartmentalized notions implicit in the physical design of the building stand in opposition to Dave Lawrence's efforts to push his staff to adapt a more web-like and inclusive workplace structure, one that emphasizes direct communication, the integration of tasks, flexibility, and a relative disregard for rank.

The contrast between how space is used at the *Miami Herald* and how it is used at Intel could hardly be greater, and it illustrates how physical design can help facilitate the formation of webs. As has been noted, the scorn for hierarchical privileges and perks that is a legacy of the individualistic Silicon Valley culture is evident as soon as one approaches Intel's huge complex, and discovers that there are no parking places reserved for executives. This designed-in egalitarianism extends to the way space is apportioned throughout the five-story glass-walled building, where everyone sits in a cubicle, including the President. The almost total lack of correspondence between one's position in the organization and the size and location of one's office emphasizes and encourages the development of the nonpositional power that is so valued an aspect of how the company functions.

The well-laid-out cubicles at Intel, with their sound-absorbent and comparatively high walls, provide a mix of privacy and quiet, diminishing both the isolation that is a feature of private offices and the chaos characteristic of open platforms. And because personal workspace is allocated in accord with what people need to accomplish their tasks rather than in order to reflect their rank, space is not viewed as a perk that helps to define status. Absent entirely is the "from Versailles to the pigsty" syndrome notable in many organizations, in which the top executives' offices, the boardrooms, and the building's entrance are wildly luxurious, while rank-and-file employees labor in inefficient squalor. Intel's use of cubicles also permits an unusual degree of flexibility: the dividing panels can be shifted to enlarge or diminish an office's size, or to accommodate a new assis-

tant or a new group of tasks. This facilitates Intel's policy of continual reorganizations, enabling people to change jobs without having also to change offices.

Perhaps the most noteworthy aspect of Intel's physical design is its cafeteria, a large and light-filled space built on a variety of levels, so that it feels open and intimate at the same time. Everyone in the company eats in the cafeteria, from the Chairman to the security guards, as well as workers from an Intel manufacturing plant that shares the headquarters' grounds. Tall glass doors open from the main room onto a landscaped courtyard, with a fountain, flowers, and plenty of trees, as well as tables and benches, so that people can enjoy their meals outdoors if they choose.

More striking than its humane and cheerful design, however, is how the Intel cafeteria is actually *used.* Remaining fully open from eight each morning until six at night, it serves as a meeting and conference room for people throughout the company. "Since private space is limited, we come here when we need to stretch out and talk to someone," explains Carlene Ellis. "It's especially helpful when you need to discuss something with a couple of people; the cubicles are too small for that. The cafeteria makes getting together easy—you don't have to schedule a conference room, you just tell someone to meet you downstairs. It's relaxed and informal, and you can get coffee or go outdoors if you want. There are days when I spend most of my time here. If anyone wants to find me, this is where they look."

Carlene points out that being interrupted is not a problem, for scattered around the room are small signs that say "One on One." Putting one of these on the table signals that a private conference is in session. "If people see a sign on your table, they won't stop to chat. So you can be very private even though you're visible." The cafeteria thus permits privacy to flourish within a public space, blurring the usually rigid distinction in organizations between what happens in private and what occurs in public. This helps to vanquish the unequal balance that prevails in most companies, where privacy is the privilege of those who wield positional power—and is also indistinguishable from isolation.

The Intel cafeteria, as a large and highly visible central gathering

space shared by all, creates a feeling of community. And by encouraging ongoing informal interaction among people at various levels, it diminishes the distance between top executives, mid-level managers, and support staff. Ultimately, the space serves a function similar to that of the large central plazas in European and Latin American towns, which create a sense of shared identity and interest among all citizens, rich or poor, by offering them a common and accessible spot in which to meet. In a business organization, the sense of shared identity that such a space creates can help people in the ranks to focus on the company's greater mission, rather than getting stuck in isolated concerns. A common space provides a common ground, and common ground is essential if webs of inclusion are to flourish.

Although Intel makes use of its physical design to encourage a sense of belonging within the organization, it does not use space in ways that reach out to the larger world. As one of thousands of large commercial and industrial buildings spread out along Route 101 as it surges north from San Jose, the Intel complex is isolated from everything that adjoins it; it can be reached only by means of an access road from the highway. As at the *Miami Herald,* Intel employees must use their cars if they want to run errands on their lunch hour or eat outside the complex; the supremely compartmentalized fortress mentality of suburban development prevails. And so despite Intel's thoughtful use of internal space to promote web-like and inclusive values, the exigencies of sprawl prevent it from relating to the larger physical landscape or the greater community of which it is a part.

Of Space and Time

Watching life swirl around me one afternoon in the Intel cafeteria, I recalled an observation made to me by Nancy Badore, at the time Director of Executive Training for Ford. "The real *stuff* of work," she noted, "gets done mostly in downtime, during those informal moments when people just happen to run across one another, or start up a casual conversation that meanders along until it leads to some new

defined as *teams that go the distance.* At the *Miami Herald,* we saw how what was originally configured as a team to address diversity issues evolved into a web because, in the process of doing their work, the team members began breaking down barriers between the business and editorial sides of the paper, thus reconfiguring how the organization as a whole was run. At Beth Israel Hospital in Boston, we saw how the introduction of primary nursing changed the nature of not only the nurses' jobs but those of everyone else, turning administrators into support staff and doctors into support professionals.

In the cases examined in this book, the form of each organization and its concerns were shaped by the individuals within the organizations—individuals whose *positions* did not necessarily reflect the influence they were able to exercise. These people changed their companies by their very presence. What they accomplished was a direct expression of *who they are,* and would not have been done in the same way or had had the same effect if someone else had done it. Ric Giardina tells us that he joined Intel for this very reason, because he sensed that it was "the kind of place where you could create something on your own, be imaginative, really leave your mark."

The entrepreneur and writer Paul Hawken notes that a prime source of satisfaction in starting a business lies in creating something that reflects who you are. He writes:

> I am suggesting that the best idea for a business will be something that is deep within you, something that can't be stolen because it is uniquely yours and anyone else trying to execute it without the (perhaps unconscious) thought you have given the subject will fail. It's not basically different from writing a novel. *A good business and a good novel are both faithful and uncluttered expressions of yourself.*

Successful entrepreneurs have always known the satisfaction of this kind of expression; even unsuccessful entrepreneurs feel it in some measure, because they are responsible for what they create. But peo-

focus on the long term can hardly serve as a model for American enterprise. Yet the secret of the family network, as Kotkin is quick to point out, is its absolute and unyielding emphasis on *values*. There are thousands of examples—some of them in this book—that show what people are capable of achieving when their work is a reflection of strongly held values. Web-like organizations are especially apt to be driven by clearly articulated values, since a tight focus on mission is the glue that holds their flowing structures together. Also, the people in webs of inclusion are more likely to take their organization's values seriously, since they play a role in helping to define them.

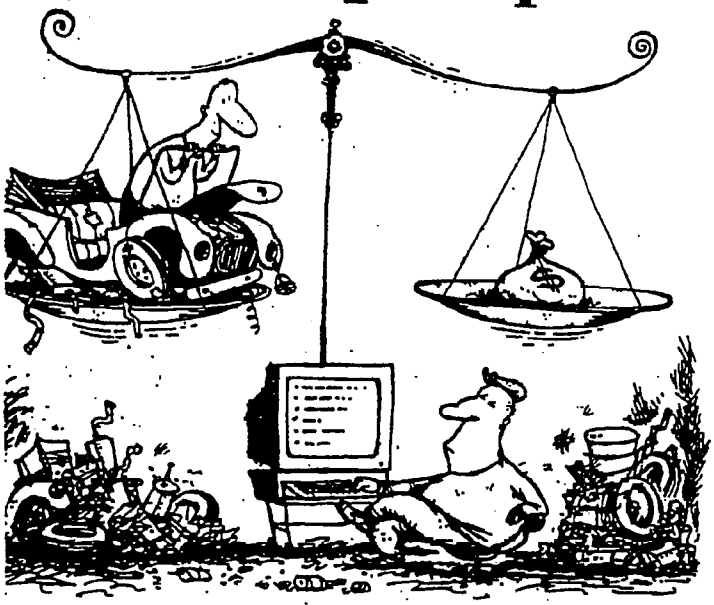
Gerry Laybourne speaks of the excitement she felt last year when starting Nickelodeon in the U.K.: "We had these meetings in this kind of bunker near Heathrow Airport. It was a real dump. We didn't even have chairs; we all sat on the floor. Just sat there for *hours,* planning everything, all of us together. It brought me back to the old days in this company, when it was just a small group, planning everything as we went. There we were again, this little band, determined to do what everyone assured us could not be done. We worked half the night—it was just *thrilling.*"

That's the kind of enthusiasm that money cannot buy. And it doesn't come from Gerry Laybourne being the boss. Ric Giardina expressed the same sentiments when he described his trademarking work for Intel; so did Vic Bubnow when talking about the *Herald*'s diversity committee. When people are this focused on achievement, they are able to use all their talents, one of the most gratifying experiences a human being can know. Organizations that engage their people by instilling an almost tribal sense of values can get them to focus on what's best for the company in the long term. That's what the risk of enterprise is all about.

Of course, if America's companies are to work this way, some changes will have to be made in how their shares are traded, so the market will not penalize them every time they fail to put the quarterly profits earned by their investors above everything else. Our mechanisms for financing business do not always support the changes in structure that we need to put in place; this is becoming more widely

Exhibit B-70

r the Scrapheap



BY DAVID CLARK FOR THE WASHINGTON POST

e material, entering the data into
y Mac computers. Based on scrap
that Bonnett regularly updates, the
uter software calculates payments to
uckers and prints out checks or cash
ers while the drivers are waiting.
ed knows instantly what he's buying
ow much is on hand," Floam said.
e's no guessing."

It is a level of precision that is invaluable in scheduling operations of the huge, costly shredders and sorters, which run up $12,000 of electric power a month at Davis Industries, Bonnett said.

The software is married to other programs at Davis Industries that manage its accounts and track the price and quantities

See SOFTWARE, page 20.

CYBERTALK

Newcomers Chip Away At the Market

Intel Holds Top Slot In Technology, Sales, Ads

By John Burgess
Washington Post Staff Writer

Intel Inside

You're shopping for a computer and you see that logo on one. It means that the machine contains a microprocessor made by the world's largest chip company, Intel Corp., and that probably makes you feel pretty secure about buying.

AMD Inside. Cyrix Inside.

Huh?

Not that you'll ever see those last two slogans. But you get the idea: You've probably never heard of Intel's two main competitors. Their sales are small and they don't come close to being household names whose mere mention creates warm and fuzzy feelings in potential computer buyers, even though they are quality products that have been on the market for years.

Behold now new efforts to get respect. Cyrix Corp. last week came out with Cyrix brand mail-order computers built around

See CYBER, page 22

ES

-BYE VIRUS

as the classic bad news, good news
ne last week at the 1996 Computer
Protection conference in Arlington by
itional Computer Security
ation.

bad news: According to a recent
of about 300 information technology
s for large corporations, the number
puter viruses circulating out there
to be going up. Ninty percent of the
ers said that their companies had
tered one in January. Just 70 percent
bered spotting a computer virus
the second half of last year.

good news: "The cure is not difficult,"
er Tippett, president of NCSA. Much
about software that can identify and
act viruses. Some kinds search for

THAT'S NOT FUNNY! (IT IS SO!)

Do April Fool's jokes have a place on-line?

Last week America Online of Vienna got a discussion going on the question with a gag news story. People who clicked on the

service's "Top News Update" item on on April 1 got a report that life had been discovered on Jupiter, complete with picture of the planet and speculation from an "expert" as to what form it might take, Reuter reported.

By early evening the "story" had generated 1,300 messages of comment. "Is

BESTSELLERS

Most popular titles in the Macintosh category sold by 10 Software Etc. stores in the Washington area in the week ended March 30:

	TITLE	PUBLISHER
1.	MacInTax	Intuit
2.	Math Blaster Episode 1	Davidson
3.	Winnie the Pooh And the Honey Tree	Disney
4.	Lion King Activity Center	Disney
5.	QuickBooks Version 4.0	Intuit
6.	Myst	Broderbund

WASHINGTON BUSINESS/AI

Trying to Chip Away at Intel's Lead

CYBER, from page 17

its fast new 6x86 chip. Flip through a computer magazine and you may see their ads, which are trying to affix the Cyrix name in the public mind. And Advanced Micro Devices Inc. (AMD) is touting a new chip of its own.

It's one of the great paradoxes of the computer business: In much of it, companies rise and fall so fast that you can't keep track. But in parts, very important ones, names endure year after year. Microsoft Corp. for software, Intel Corp. for the basic chip of the computer, the microprocessor.

According to Microprocessor Report, an industry newsletter in Sebastopol, Calif., Intel made about 90 percent of the 60 million microprocessors sold for Windows-type computers worldwide in 1995. Pentium is the company's flagship product now.

Gnawing on the remaining 10 percent is a pack of smaller companies led by Advanced Micro Devices Inc. and Cyrix. They make chips that mimic Intel's. They're not clones in the sense of being strict copies. That would be illegal. Rather, they work like Intel's but through different designs—they achieve the taste of an Intel chocolate cake, so to speak, but with a different recipe.

But try as they do, they can't break out of that smaller-player niche.

That's partly because Intel has proved very willing to cut prices and often has trounced them on technology. With $16 billion in sales last year, it's got a huge research budget and has been able to stay one generation ahead. Intel has begun selling the successor chip to the Pentium, called the Pentium Pro; the competitors are continuing to focus on matching the powers of the Pentium.

That's been the pattern: Intel pioneers a new generation of chip, dominates it for a while and collects billions of dollars in sales, then withdraws to higher, more profitable ground in the face of competition on the lower ground, bringing the market with it. It moved so quickly to the Pentium, some analysts say, that the competitor companies are probably in a weaker position today than they were two years ago.

Intel also has them beat on image. It has spent millions of dollars on TV and magazine ads to promote the "Intel Inside" slogan. The idea is to get consumers interested in what makes up something they own, like those General Motors Corp. ads that advised people to insist on "genuine GM parts" when getting their cars repaired.

The fact is that, as computers become mass-market appliances in millions of homes, brand loyalty is starting to count as much as it does in detergent or automobiles, if not more. When you're putting down $2,000 for a single purchase, you feel better seeing a trusted name.

This is true even though Intel's competitors generally have succeeded in delivering what they promised, chips that cost less but seem like Intel's. Technical compatibility has been generally good, industry watchers say. In many cases, you can plug the alternative chips into a circuit board and the computer won't know the difference.

And they're making progress in closing the technology gap. AMD's new 5k86 is comparable in performance to a 75 MHz or 90 Mhz Pentium (that's the lower end of the Pentium family), says Microprocessor Report, but costs about half as much. Cyrix's new 6x86 chip checks out as a bit faster than the highest-end Pentium, according to the publication.

The newcomers have made some progress in reaching the big leagues—Acer and Compaq Computer Corp. have used AMD chips in some machines, for instance. International Business Machines Corp. is putting Cyrix's 5x86 chip in some ThinkPad laptops.

But for the most part, where you find the alternate chips is in the unknown brands, the ones that advertise at the back of computer publications.

But in the future? The newcomers swear it's going to be different. With the 6x86 chip, Cyrix contends it's competing head to head with Intel at the high-end for the first time. AMD promises it will catch up with Intel by next year, fielding a matching high-end chip at the same time as the industry leader, rather than being a year or two behind. Watch then, they say—Intel's share will erode.

It's an adventurous notion, but stranger things have happened in this industry. ■

John Burgess's e-mail address is burgessj@washpost.com

Exhibit B-71

OUR ECONOMY'S SECRET WEAPON: THE GARAGE

MARCH 4 1996

$4.50

FORTUNE

Roberto Goizueta, the man atop the No. 1 brand

AMERICA'S MOST ADMIRED COMPANIES

The 'A' List

1. Coca-Cola
2. Procter & Gamble
3. Rubbermaid
4. Johnson & Johnson
5. Intel
6. Merck
7. Microsoft
8. Mirage Resorts
9. Hewlett-Packard
10. Motorola

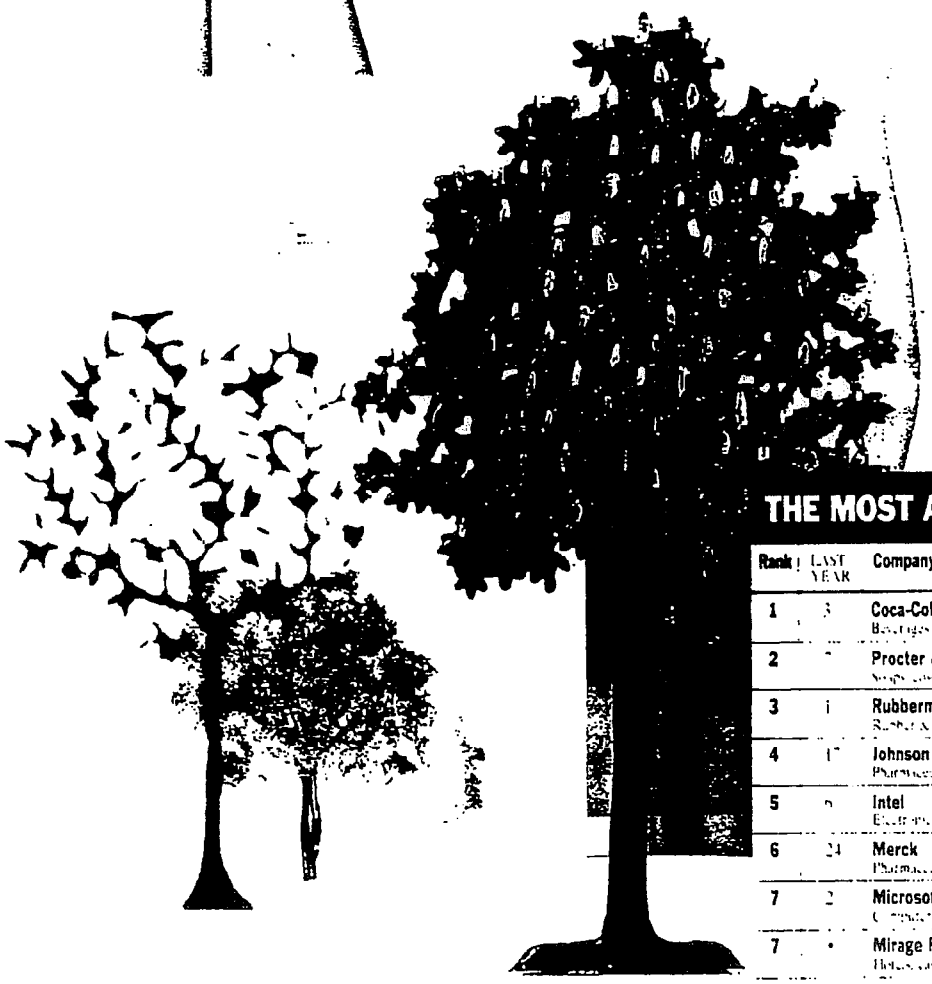
The Verdict: Brands Rule

orporate eputations

What a year it was: Coca-Cola blossomed, reaching the top at Rubbermaid's expense. Meanwhile, beleaguered Kmart, Salomon, and Morrison Knudsen fell like dead leaves to the bottom of the list.

Comebacks and comeuppances

Anne B. Fisher

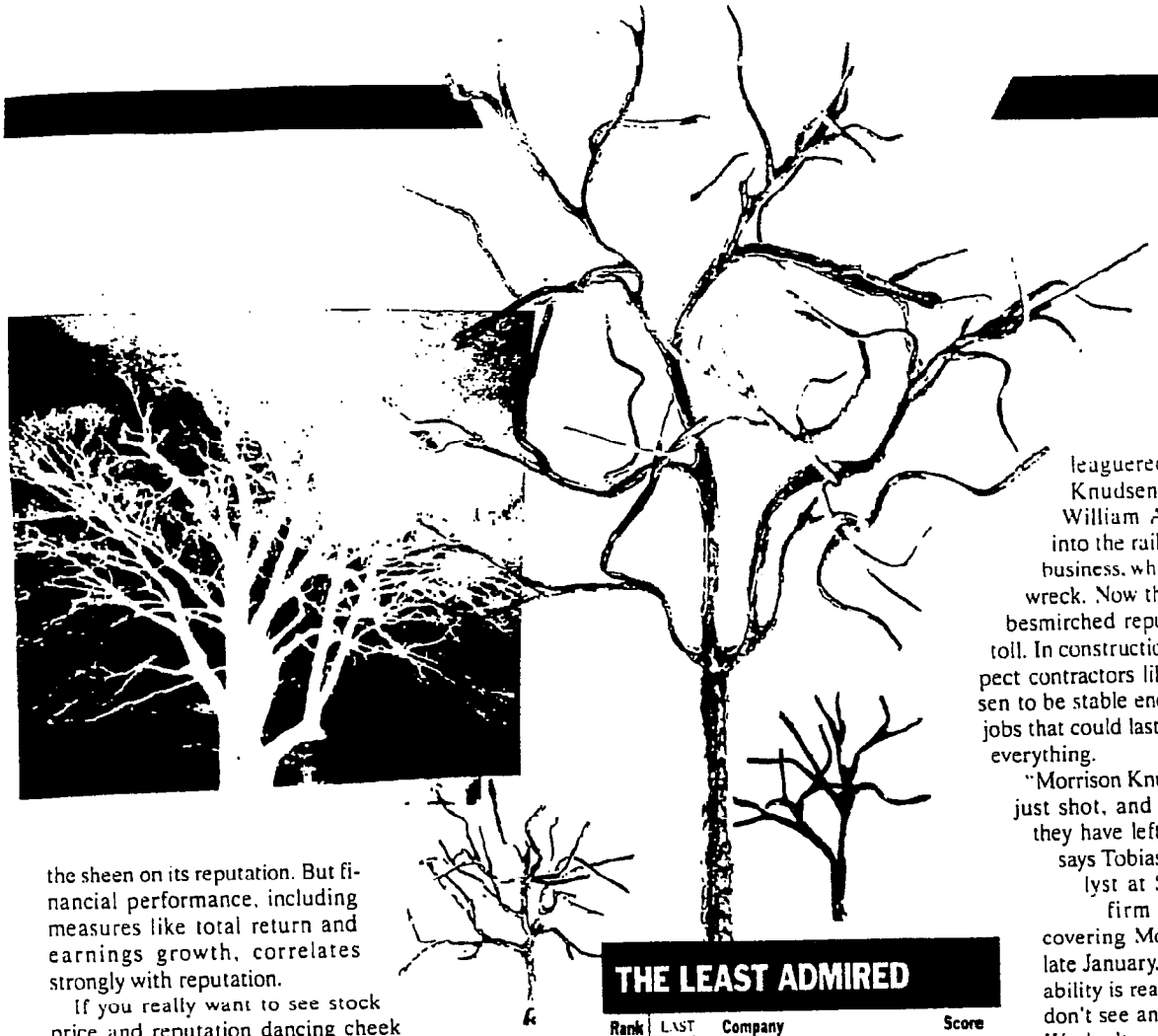


Each year we hear of more companies that have made an explicit corporate goal of improving their performance in FORTUNE's annual survey of corporate reputations. We even know of people whose bonuses depend on how well their companies perform. Why such intense focus on reputation?

Of course, it's nice to be liked. But these companies' motives aren't just warm and fuzzy. Far from it. One reason companies fret over their reputations is financial. Good name is to strong financial performance as chicken is to egg. It's not always clear which begets which, but it's awfully hard to have one without the other. In an attempt to measure exactly how closely reputation and performance are linked, the research firm Clark Martire & Bartolomeo studied the assets, profits, and ten-year annual return to shareholders of the FORTUNE 1,000 and correlated these and other financial indicators with companies' standings on the most admired list. Bigness alone, the study found, won't help: There was virtually no relationship between the size of a company's assets and

THE MOST ADMIRED

Rank	LAST YEAR	Company	Score
1	3	Coca-Cola Beverages	8.70
2	*	Procter & Gamble Soaps, cosmetics	8.55
3	1	Rubbermaid Rubber & plastic products	8.35
4	17	Johnson & Johnson Pharmaceuticals	8.32
5	9	Intel Electronics: semiconductors	8.30
6	24	Merck Pharmaceuticals	8.26
7	2	Microsoft Computer & data services	8.23
7	*	Mirage Resorts Hotels and casino hotels	8.23
9	10	Hewlett-Packard Computers, office equipment	8.19
9	4	Motorola Electronics: electronic equipment	8.19



the sheen on its reputation. But financial performance, including measures like total return and earnings growth, correlates strongly with reputation.

If you really want to see stock price and reputation dancing cheek to cheek, look at Coca-Cola, which is Numero Uno this year for the first time. Coke's shares, now at about $76, rose 44% over the past year. (For more on how Coca-Cola polishes its reputation, see the preceding story.) Rubbermaid, on the other hand, had a rocky year, dropping from the No. 1 spot to No. 3. Both its reputation and its stock price were dented by a truckload of troubles that all came along at once, including a feud with megacustomer Wal-Mart over pricing.

But reputation entails much more than just minting money. As measured in the survey, half of it comes from intangibles like the way a company treats its employees, how much it spends on research and development, and the strength of its management team. These abstractions count more than you might think.

Consider what can happen when your corporate image gets tarnished. A rather extreme case: Morrison Knudsen. The construction company, which in its prime built the Hoover Dam, took a huge free fall this year in the quality-of-management score and a dive to the lowest overall score of anyone but the perpetually beleaguered TWA. Morrison Knudsen's erstwhile CEO, William Agee, had plunged into the railcar and locomotive business, which ended up a train wreck. Now the Boise company's besmirched reputation is taking its toll. In construction, where clients expect contractors like Morrison Knudsen to be stable enough to take on big jobs that could last years, credibility is everything.

"Morrison Knudsen's reputation is just shot, and the few customers they have left are very nervous," says Tobias Levkovich, an analyst at Smith Barney. The firm officially stopped covering Morrison Knudsen in late January. "The company's viability is really questionable. We don't see any value in the stock. We don't see any way for them to recover."

THE LEAST ADMIRED

Rank	LAST YEAR	Company	Score
417	395	TWA Airlines	3.05
416	326	Morrison Knudsen Engineering, construction	3.12
415	392	Kmart General merchandise	3.36
414	393	USAir Group Airlines	3.77
413	380	A&P Food & drug stores	4.25
412	389	Continental Airlines Airlines	4.27
411	•	Amerco Trucking	4.29
410	•	Salomon Brokerage	4.34
409	384	Woolworth Specialist retailers	4.40
408	335	Standard Commercial Tobacco	4.44

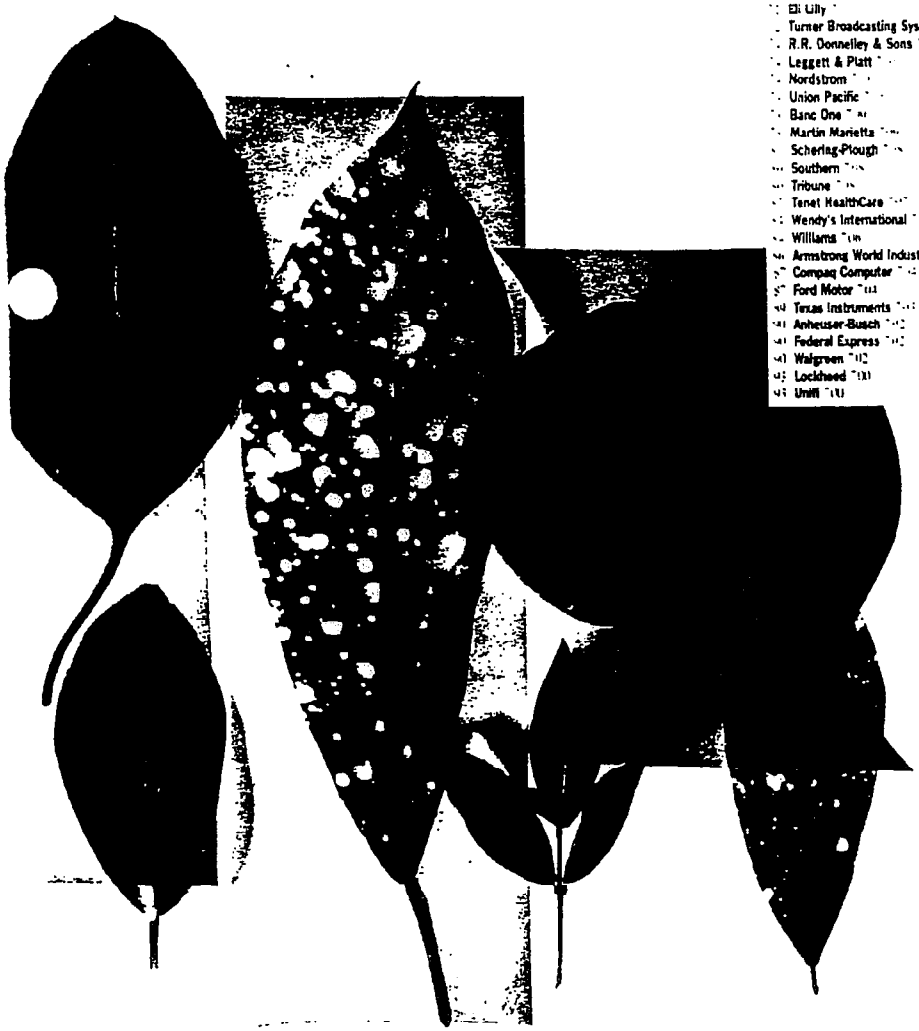
EVEN for companies with stellar reputations, this was a tumultuous year. Among the setbacks, surges, and surprises in 1995: Microsoft, rated tops in its industry at attracting and developing talented new blood, nevertheless slid from No. 2 on the Big List to No. 7. Perhaps the Justice Department's ongoing antitrust investigation suggests that the software maker isn't invincible. UPS, bedeviled by a long drivers' strike, still held the highest score in the package delivery business, even though it fell out of the top ten overall to the No. 25 spot. And how about newcomer Mirage Resorts, which popped up in the No. 7 slot (because it was ranked so high by its own industry)? Doesn't it run gambling casinos? Yup, and rivals say that nobody does it better.

Johnson & Johnson (No. 4) and Merck rejoined the ten most

ILLUSTRATIONS BY NOLA LÓPEZ

MOST ADMIRED

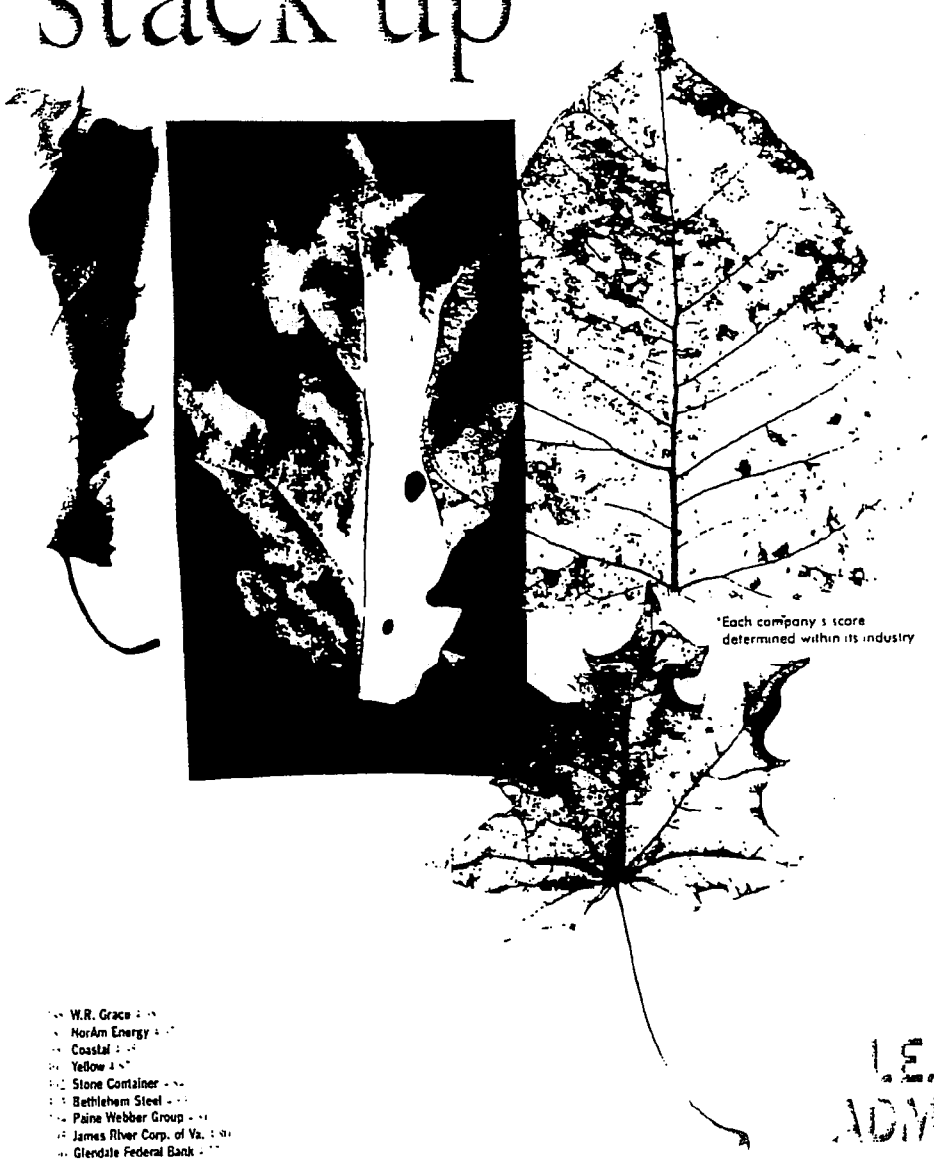
Merck
Microsoft
Hewlett Packard
Motorola
Minnesota Mining & Mfg.
Pfizer
Walt Disney
McDonald's
Gillette
Levi Strauss Associates
Berkshire Hathaway
Home Depot
Pronus
Boeing
Marriott International
Enron
Albertson's
PepsiCo
Du Pont
United Parcel Service
Corning
J.P. Morgan
United HealthCare
Intl. Flavors & Fragrances
General Electric
Publix Super Markets
Goodyear Tire & Rubber
Shell Oil
Merrill Lynch
Norwest
Capital Cities ABC
Kimberly-Clark
Southwest Airlines
Charles Schwab
Columbia HCA Healthcare
Exxon
Illinois Tool Works
SBC Communications
AT&T
Sysco
Alcoa
AlliedSignal
Mobil
Norfolk Southern
Wal-Mart Stores
Deere
Abbott Laboratories
Emerson Electric
CUC International
Cardinal Health
Clorox
Dow Chemical
Dow Jones
Fluor
Nucor
Host Marriott
Caterpillar
Viacom
American Intl. Group
Citicorp
General Mills
Oracle Systems
Sara Lee
Amoco
Xerox
Eli Lilly
Turner Broadcasting System
R.R. Donnelley & Sons
Leggett & Platt
Nordstrom
Union Pacific
Banc One
Martin Marietta
Schering-Plough
Southern
Tribune
Tenet HealthCare
Wendy's International
Williams
Armstrong World Industries
Compaq Computer
Ford Motor
Texas Instruments
Anheuser-Busch
Federal Express
Walgreen
Lockheed
Unifi
Sun Microsystems
W.A. Hanna
Reader's Digest Association
NationsBank
FPL Group
Gannett
Colgate-Palmolive
International Paper
Federal National Mortgage Assn
Shaw Industries
Penske Truck Leasing
McKesson
Phelps Dodge
Springs Industries
BellSouth
Safeway
U.S. Healthcare
VF
Coca-Cola Enterprises
ConAgra
Circus Circus Enterprises
CSX
Chrysler
Centex
Herman Miller
Monsanto
Office Depot
J.C. Penney
BankAmerica
CPC International
H.J. Heinz
HON Industries
Panhandle Eastern
Genuine Parts
Chevron
Interpublic Group
PPG Industries
Circuit City Stores
AMR
Brinker International
Golden West Financial
Morgan Stanley Group
Premark International
Reynolds Metals
Cooper Tire & Rubber
Dana
First Union
May Department Stores
Weyerhaeuser
Ameritech
Automatic Data Processing
Alco Standard
Honeywell
Knight-Ridder
American Brands
Eaton
Bristol-Myers Squibb
Foster Wheeler
Thermo Electron
Toys "R" Us
UAL
Winn-Dixie Stores
Kroger
State Farm Group
Johnson Controls
American Home Products
Bayer
Sonat
Avon Products
Computer Associates Intl.
Eastman Kodak
Newell
Roadway Services
Intl. Business Machines
Omnicom Group
Lowe's
Fed. Home Loan Mortgage Assn.
Mead
Unilever U.S.
General Dynamics
Pacific Gas & Electric
Russell
Supervalu
Washington Mutual
Bear Stearns
First Data
Liz Claiborne
Owens-Corning Fiberglas
Philip Morris
Bell Atlantic
United Technologies
Daimler-Benz
Ryder System
Tejas Gas
Georgia-Pacific
TRW
Sara Lee
Duke Power
Chemical Banking
Consolidated Freightways
Crown Cork & Seal
Dayton Hudson
Service Group
Household International
New York Times
Santa Fe Pacific
Black & Decker
Stanley Works
Texaco
Cummins Engine
American Express
Ingersoll-Rand
Burlington Resources
Hanson Industries N.A.
Union Carbide
Arco
Freeport-McMoRan
McDonnell Douglas
New York Life
Siemens
Hoechst Celanese
Phillips Petroleum
Hillenbrand Industries
Sears Roebuck
Teachers Ins. & Annuity Assn.
BASF
Dean Witter Discover
Rockwell International
Raytheon
American Electric Power
Dell Computer
Paccar
Whirlpool
MCI Communications
ADVO
Equitable Resources
WestPoint Stevens
American Greetings
Parker Hannifin
Tyco International
Alumax
MGM Grand
Northwest Airlines
Textron
Conrail
McGraw-Hill
Seagate Technology
Becton Dickinson
Halliburton
Humana
La-Z-Boy Chair
Tandy
Burlington Northern
Computer Sciences
First Financial Management
Northrop Grumman
Time Warner
Bergen Brunswig
Mark IV Industries
Tenneco
Peter Kiewit Sons'
American General
Cyprus Amax Minerals
GTE
SCEcorp
Federated Department Stores
UST
Caesars World
Owens-Illinois
QVC
Harcourt General
Limited
Texas Utilities
EG&G
Masco
Ralston Purina
Delta Air Lines
Hilton Hotels
IBP
Standard Products
American Standard
Dillard Department Stores
Vulcan Materials
American Stores
Fleming
Mitchell Energy & Development
Bridgestone Firestone
Landstar System
Travelers Inc.
Ball
Novell
Sprint
Adolph Coors
Loews
General Motors



8.5 8 7.5 7 6.5

ow **417** companies stack up

What makes a reputation? Is it financial performance, strong management, innovation? Curiously, one thread running through the best companies on our list: Twelve of the top 15 have great brands. Are companies like Coke and Intel onto something?

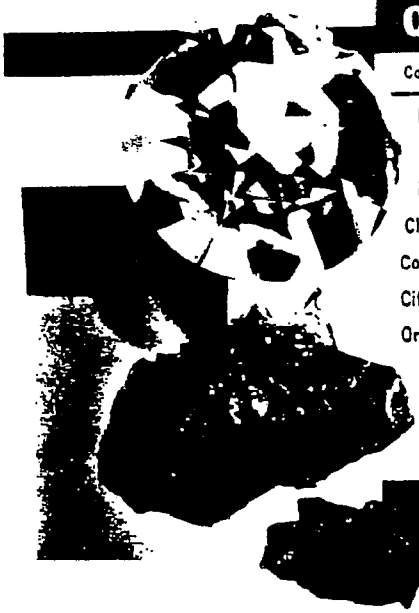


*Each company's score determined within its industry

Burlington Industries
Rhone-Poulenc Rorer
US West
Aramark
Zeigler Coal Holding
Chase Manhattan
HealthTrust
Great Western Financial
J.B. Hunt Transport
International
Air Express International
Bausch & Lomb
Alaska Air Group
Dial
Entergy
Kimball International
Morrison Restaurants
H.F. Ahmanson
Raychem
Warner-Lambert
Bankers Trust N.Y.
MascoTech
Fieldcrest Cannon
Pitney Bowes
Standard Federal Bank
TNT Freightways
Apple Computer
Public Service Enterprise Group
Dresser Industries
GenCorp
Nationwide Ins. Enterprise
Louisiana Land & Exploration
PriceCostco
Collins & Aikman
Turner Corp.
Metropolitan Life
Champion International
ITT
Safety-Kleen
Times Mirror
Mohawk Industries
Enserch
Alberto-Culver
Comdisco
Nynex
Digital Equipment
Gillett Holdings
Interco
Helene Curtis Industries
Consolidated Edison of N.Y.
Brown-Forman
International
Occidental Petroleum
Pittston
Emcor Group
Universal
Asarco
USX
Arkansas Best
RJR Nabisco Holdings
Dun & Bradstreet
Airborne Freight
Ryland Group
J.E. Seagram
Inland Steel Industries
Scott Paper
Mansel
Cigna
Unicom
Food Lion
America West Airlines
LTV
PacifiCare Health Systems
Kansas City So. Industries
Bally Entertainment
Kellwood
Archer Daniels Midland
Navistar International
Fruit of the Loom
FoxMeyer Health
Oryx Energy
Dibrell Brothers
Aetna Life & Casualty
Lehman Brothers Holdings
Chicago & NW Transportation
Triarc
Caremark International
Maxxam
Prudential Ins. of America
Melville
Whitman
Foamex
Shoney's
Boise Cascade
Transco Energy
National Steel
W.R. Grace
NorAm Energy
Coastal
Yellow
Stone Container
Bethlehem Steel
Paine Webber Group
James River Corp. of Va.
Glendale Federal Bank
Unisys
Westinghouse Electric
Beverly Enterprises
Southland
Flagstar
CBS
Family Restaurants
Southern Pacific Rail
Foodmaker
IPS Textile Group
California Federal Bank
Standard Commercial
Woolworth
Salomon
Amerco
Continental Airlines
A&P
USAir Group
Kmart
Morrison Knudsen
TWA

LEAST ADMIRED

5.5 | 5 | 4.5 | 4 | 3.5



BIGGEST GAINS OVER LAST YEAR

Company	Point change	% change	Score
Digital Equipment	1.25	28.7%	5.61
UAL	1.12	20.3%	6.64
Northwest Airlines	0.90	16.9%	6.24
Champion International	0.89	18.5%	5.71
Coca-Cola Enterprises	0.81	13.4%	6.87
Citicorp	0.77	12.1%	7.15
Oryx Energy	0.74	16.5%	5.23
Merck	0.67	8.8%	8.26
Boise Cascade	0.65	14.8%	5.04
Intl. Business Machines	0.64	10.8%	6.58

BIGGEST LOSSES OVER LAST YEAR

Company	Point change	% change	Score
Morrison Knudsen	-2.48	-44.3%	3.12
PacifiCare Health Systems	-1.87	-26.1%	5.30
Archer Daniels Midland	-1.36	-20.6%	5.25
Universal	-1.23	-18.4%	5.47
CBS	-1.22	-21.0%	4.58
Bankers Trust New York	-1.10	-15.8%	5.87
Standard Commercial	-1.08	-19.6%	4.44
Dibrell Brothers	-1.02	-16.4%	5.21
UST	-0.87	-12.5%	6.11
Yellow	-0.84	-14.7%	4.87

BIGGEST GAINERS AND LOSERS

admired after a conspicuous absence last year. Merck (No. 6) scored first among pharmaceutical makers in product quality. In 1994, when would-be health care reformers in Washington accused drug companies of getting obscenely rich at the expense of sick people, drug companies' reputations took a beating. In 1995 they bounced back. A fast-growing managed-care business and promising new treatments for osteoporosis and high cholesterol helped Merck regain its top-ten ranking. J&J's U.S. sales jumped 32% during last year's fourth quarter, thanks partly to Risperdal, a new antipsychotic drug, and Propulsid, a heartburn remedy. Neither product, though, is likely to match the popularity of Eli Lilly's $2 billion baby, Prozac, whose overnight celebrity nudged Lilly up to 72nd place from 169th.

REPORTER ASSOCIATE *Ani Hadjian*

And now take a look at this year's least admired. Three airlines—Continental (No. 412), USAir (No. 414), and TWA (No. 417)—are becoming fixtures at the bottom of the list, to nobody's great surprise. Despite its last-place finish, there may be hope for TWA. The company saw its stock take off last year, though from a base well below sea level. The airline's 1,176.9% total return for 1995 reflects a share price that went from 81 cents to a bit over $10. Some Wall Streeters believe the airline has finally got its costs in line, and a turnaround may be on the horizon. New faces in the reputation doghouse include Wall Street trading powerhouse Salomon, where Chief Executive Deryck Maughan has presided over a pay-for-performance scheme that's sent disgruntled talent fleeing to competing firms.

Much of the year's drama played out in the ranking's middle regions. Digital Equipment Corp., struggling along the comeback trail after a few truly dismal years, still ranks a ho-hum No. 337 out of 417 companies. But the computer maker no longer resides in the bottom-ten barrel and seems likely to keep on rising. Archer Daniels Midland, tarnished by allegations of price fixing and a curious and well-publicized hostility toward its customers, tumbled from No. 150 to No. 368. CBS, rated No. 301 a year ago, saw its score drop by about 20%, to 402nd place, reflecting industry insiders' view of new parent Westinghouse and its unglamorous boss, Michael Jordan.

Derivatives, which doubtless seemed like a clever idea at the time, sideswiped Bankers Trust (No. 312). The bank has paid out tens of millions

HOW IT WAS DONE

The 417 corporations included in the 14th annual Corporate Reputations survey are drawn from the new universe of companies that was created when the FORTUNE 500 industrial and service directories were merged last year. Seventy new names and five new industry groups make this the most comprehensive survey yet. To determine the rankings, FORTUNE asked more than 11,000 executives, outside directors, and financial analysts to rate the ten largest companies by revenues (if there were that many—our minimum was five) in their industry by the eight criteria shown on page 96. Companies got assigned to an industry group according to the business that contributed the most to their revenues. An index appears at the end of the listings.

QUALITY OF MANAGEMENT

MOST ADMIRED	Score
Coca-Cola	9.28
Procter & Gamble	9.03
Berkshire Hathaway	8.86
LEAST ADMIRED	**Score**
Morrison Knudsen	3.09
Kmart	3.67
TWA	3.75

QUALITY OF PRODUCTS OR SERVICES

MOST ADMIRED	Score
Mirage Resorts	9.15
Rubbermaid	9.14
Coca-Cola	9.01
LEAST ADMIRED	**Score**
TWA	3.74
Kmart	4.06
Southern Pacific Rail	4.32

ABILITY TO ATTRACT, DEVELOP, AND KEEP TALENTED PEOPLE

MOST ADMIRED	Score
Microsoft	9.00
Procter & Gamble	8.73
Intel	8.51
LEAST ADMIRED	**Score**
TWA	2.52
Morrison Knudsen	3.04
Kmart	3.15

VALUE AS A LONG-TERM INVESTMENT

MOST ADMIRED	Score
Coca-Cola	9.07
Berkshire Hathaway	8.90
Procter & Gamble	8.72
LEAST ADMIRED	**Score**
TWA	2.04
Morrison Knudsen	2.44
Kmart	2.78

USE OF CORPORATE ASSETS

MOST ADMIRED	Score
Berkshire Hathaway	8.86
Coca-Cola	8.74
Johnson & Johnson	8.35
LEAST ADMIRED	**Score**
Morrison Knudsen	1.98
TWA	2.90
Kmart	3.11

FINANCIAL SOUNDNESS

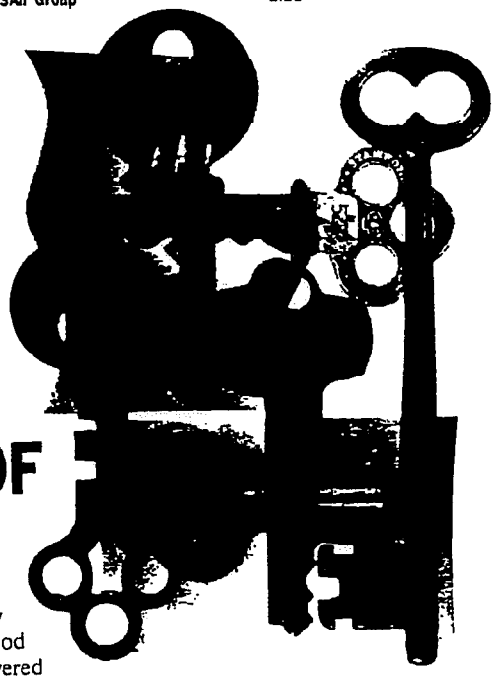
MOST ADMIRED	Score
Microsoft	9.37
Coca-Cola	9.27
Berkshire Hathaway	9.17
LEAST ADMIRED	**Score**
TWA	1.42
Morrison Knudsen	2.02
USAir Group	2.26

INNOVATIVENESS

MOST ADMIRED	Score
Enron	9.16
Rubbermaid	9.06
Intel	9.04
LEAST ADMIRED	**Score**
Kmart	3.28
CBS	3.43
TWA	3.91

COMMUNITY AND ENVIRONMENTAL RESPONSIBILITY

MOST ADMIRED	Score
Levi Strauss Associates	8.13
Johnson & Johnson	8.06
3M	7.99
LEAST ADMIRED	**Score**
Morrison Knudsen	3.78
Salomon	3.82
Kmart	4.09



EIGHT KEY ATTRIBUTES OF REPUTATION

of dollars in settlements to clients whose derivative deals went kerflooey, and has yet to resolve a vituperative lawsuit brought by Procter & Gamble. Voted No. 3 in its industry last year, Bankers Trust has since fallen to No. 10 (out of ten). The executives surveyed did give the bank high scores for innovativeness, raising the question of how many such innovations any company can withstand.

WHEN it comes to high finance, Berkshire Hathaway, Warren Buffett's Omaha-based conglomerate, fared much better. This year it tops the diversified-financial industry ranking in six out of eight categories. One of these is "value as a long-term investment," and no wonder. A share of Berkshire Hathaway stock went for about $70 in 1973. Its price today: $31,700.

If you've spotted some new names on the roster, there's a good reason. Altogether, the survey covered 70 new companies. That's because, beginning this year, the FORTUNE 1,000, from which the ten largest companies by revenues within each industry are drawn as candidates for most admired, merged service companies with industrials. This meant that a number of advertising and marketing companies, for example, became eligible for the first time, as did hotel and resort operators—hence Mirage Resorts' leap from nowhere into the top ten. Another significant addition: the food service industry. McDonald's appears here for the first time—and fittingly, since 1995 was a record year for profits *chez* Ronald. The burgermeister did well in almost every category except product quality, where it came in fourth, well behind No. 1–ranked Wendy's. Reflecting the growth of a world economy that increasingly ignores national boundaries, 15 of the biggest U.S. subsidiaries of overseas companies have joined the list as well.

What specifically makes or breaks a company's reputation? Asked to rate the eight attributes on FORTUNE's survey (see table above) in order of their importance, the 11,000 executives,

THE MOST ADMIRED

Company	Total return to investors	
	1985-95	1995
Coca-Cola	29.3%	46.1%
Procter & Gamble	20.0%	36.7%
Rubbermaid	13.0%	-9.8%
Johnson & Johnson	23.1%	59.1%
Intel	27.9%	78.2%
Merck	27.1%	76.8%
Microsoft	N.A.	43.6%
Mirage Resorts	22.2%	68.3%
Hewlett-Packard	17.4%	69.4%
Motorola	20.7%	-1.1%
S&P 500	14.9%	37.5%

THE LEAST ADMIRED

Company	Total return to investors	
Compound annual rate	1985-95	1995
TWA	N.A.	1,176.9%
Morrison Knudsen	-12.5%	-64.2%
Kmart	-0.8%	-42.3%
USAir Group	-8.9%	211.8%
A&P	2.4%	28.0%
Continental Airlines	N.A.	370.3%
Amerco	N.A.	20.9%
Salomon	-0.1%	-4.0%
Woolworth	1.8%	-12.5%
Standard Commercial	1.2%	-14.4%
S&P 500	14.9%	37.5%

WHAT THEY DID FOR SHAREHOLDERS

directors, and analysts polled put "quality of management" first, with "quality of products or services" a close second. ("Responsibility to the community and/or the environment" came in dead last. Oddly, "innovativeness" scored almost as low.)

So it figures that attracting topnotch executive talent is one way to shine up your image. Just ask Digital, whose quality-of-management score has improved the most among all 417 companies. When CEO Robert Palmer took on the top job in 1992, the computer maker had just lost $3.9 billion and was still bleeding. Its reputation, not surprisingly, was in the tank. "We were slow to adapt to changes in the industry, and our cost structure was way out of hand," Palmer says. He sold off some businesses and streamlined others, and he cleaned house in a big way, replacing almost all of Digital's top 200 managers. Some have been promoted from within, but many were stellar new hires wooed away from the same competitors who responded to our survey—and who thus have reason to know just how good Digital's management team really is.

Because about half of Digital's sales are international, Palmer looked around for a smart foreigner to run the PC division. He found his man in Enrico Pesatori, former head of North American operations for Italian electronics giant Olivetti. Pesatori doubled Digital's worldwide PC sales in just three years, then took the company's money-losing core systems group into the black.

None of this was lost on Wall Street analysts, who put the word out to investors that Digital was getting back on its feet. The company's stock has nearly quadrupled in the past 18 months, from about $19 in mid-1994 to $72 now. In January, Digital reported its fifth straight profitable quarter. "We want to keep this up," Palmer says, "and we will. Nothing flashy—just get a little bit better, every quarter, at what we do."

Now, let's talk flashy. Quality of service, another sine qua non of a company's good name, helped boost Mirage Resorts into the exclusive top-ten club. In this category, it's got the competition beat by a wide margin. The Mirage, Golden Nugget, and Treasure Island resorts in Las Vegas and a Golden Nugget in Laughlin, Nevada, rake in $1.4 billion a year; sales are growing 23% annually. Two new Las Vegas hotels are under construction. Stephen Wynn, Mirage's voluble CEO, hangs out with show-biz types and appears, tousle-haired and grinning, in TV commercials.

Wind Wynn up and he'll talk for hours about why people have such a good time at his hotels. "Look, let's be honest, a slot machine is a slot machine. It's a commodity. The only difference between ours and one in Atlantic City and one in London is that you keep coming back to our slots because you have buddies, you have a little warm spot there," he says. Wynn's strategy is simple: Is everybody happy? If not, fix it. He explains, "We tell our people, 'If you see a hotel guest with the tiniest frown on her face, don't ask a supervisor, take care of it. Erase the charge, send the dinner back, don't charge for the room.'"

Mirage spends major bucks on employee education programs—workers, many of whom are recent immigrants, can earn high school–equivalency degrees on the premises—and elaborate parties to honor staffers who've kept the most customers smiling. Last year George and Barbara Bush showed up to kiss and congratulate the employee of the year, a 27-year-old Vietnamese woman. "This kind of stuff is expensive," Wynn says, "but it's an investment." Apparently so. Average employee turnover in the Nevada hotel-casino game is about 43% a year. Mirage's turnover, at just 12%, is the envy of the industry. Of such stuff are sterling reputations made.

Exhibit B-72

The Brand's the Thing

Not so long ago, just about everyone had given up brands for dead. Now companies like Coke, Microsoft, and Disney are proving that having a strong name may be the ultimate competitive weapon.

Betsy Morris

Doug Ivester was at his desk at Coca-Cola headquarters on a Friday in early April 1993 when the news crossed the broad tape. Philip Morris was cutting the price of its Marlboro cigarettes by 40 cents a pack.

It hit him like a punch in the gut. Ivester, then on the hot seat as president of Coca-Cola USA, knew the announcement could send stocks of big brand-name companies like Coke's tumbling. He knew it would only fuel investor fears about the threat of so-called private-label goods, those cut-rate products often sold under a retailer's own label. He also knew it would make cost-conscious retailers even more prickly. And it would most certainly add to the chorus of naysayers who had been predicting that brands were on the ropes.

The day that would forever come to be known as Marlboro Friday struck too close to home for Coca-Cola. Its brand is considered the most valuable and best known in the world. Employees speak of their brand almost as if it were a religion. Executives at the Atlanta company like to say that if the place was, God forbid, obliterated off the face of the earth—blotto, no more bricks and mortar—they could walk right over to the bank and borrow $100 billion and rebuild Coca-Cola in a matter of months, just on the strength of the brand.

Ivester never thought that private labels were really that much of a threat to Coke. What worried him was that Coke would get caught in the general backlash against brands. He snapped into action: "We understood this was going to unfairly reflect on us. So we said, 'Let's run headlong into this ambush. Let's call all the people we know, and face this thing right up front.' "

Within minutes he and other top executives, including Coca-Cola CEO Roberto Goizueta, knew their strategy; four hours later they had shaped a presentation they would deliver over and over again in the months to come. To retailers, they would painstakingly explain that branded goods like Coca-Cola did more for them than private labels because they helped make stores more profitable: The kind of shoppers brands attract, for instance, spend three to four times more on groceries than do private-label shoppers. To analysts, they would explain why soft-drink makers were not nearly as vulnerable as cigarette companies to private labels: Coke, while it commands a premium for its soda, had not used its brand to grossly overcharge consumers, and therefore there was no big opportunity for private labels to undercut them.

It helped too that Ivester, who's now COO had already begun to overhaul Coke's marketing and advertising. The company had forged an unusual alliance with Hollywood hiring superagent Mike Ovitz to create those surreal white polar bear TV ads and other spots. Now Coke, with the help of Disney (where Ovitz has become president), is forming its own ad agency to keep the innovation going. And to strengthen its rapport with consumers, Coke had brought back its famous old hourglass bottle.

Much as Coke had hoped, the widely anticipated surge in the sales of private-label soft drinks in the U.S. basically fizzled. While Coke's share of the total soft drink market

Mr. Douglas Ivester

COO, Coca-Cola

Ivester, who many believe will replace Goizueta as CEO, charges that private brands are nothing but "parasites" that suck healthy companies dry.

has risen to 41.9% from 40.4%, that of private-label drinks sold in its main outlet, grocery stores, now stands at about 10%, almost identical to where it was on Marlboro Friday. The stock of Cott, the Toronto-based private-label upstart that had become the darling of Wall Street because of the fits it had given Coke and Pepsi in Canada and the trouble it was supposed to cause in the U.S., has plummeted to about $6 a share from $35 at the height of the private-label furor.

Coke's good fortune continues: This year it bubbled to the top of FORTUNE's Most Admired list along with such other big-brand behemoths as Procter & Gamble, Johnson & Johnson, and Rubbermaid. In fact, 12 of the top 15 companies on the list are household brand names. As this suggests, it is not just Coke that has successfully stood up to the private labels, but other branded-goods companies as well. Total sales of private-label goods, which shot up in the U.S. in the early Nineties, have plateaued, suggesting they are still, in the U.S. anyway, very much a cyclical phenomenon. Those who were writing off brands just three years ago are now singing a very different tune. Brands are once again a power to be reckoned with.

ONE SIGN that brands are back on the offensive: Ad spending, still considered one of the best tools for building brand equity, will rise again for the third straight year. Robert J. Coen, director of forecasting for McCann-Erickson, estimates that advertisers will spend $174.1 billion in 1996, up 7.8% from last year. Conversely, promotional spending for things like coupons and aisle displays—often considered detrimental to brands because it focuses consumers too much on price—is eroding slowly. As a share of total marketing spending, it has dropped from 47% in 1991 to 44% today.

Brands seem to be on everyone's mind these days. GM, for instance, recently hired marketing heavyweights from the packaged goods industry to help polish its car brands. And Silicon Valley techno-wizards like Intel and Microsoft, known in the past for caring more about microchips than marketing, are now trying hard to cozy up to Main Street America.

There's proof too of the power of the brand in the slow, sad death of Eagle Snacks. PepsiCo's Frito-Lay juggernaut drove it out of business in February, even though its well-heeled parent was Anheuser-Busch. Eagle was known for its quality snacks, but it never turned a profit and therefore never had the marketing muscle to establish enough of an identity with consumers.

And if anybody doubts that a clever company with a strong brand can still command a whopper of a "brand tax" (the price premium enjoyed by a well known brand), consider the $100-plus pricetags on some pairs of Nikes, or the $120 it costs a family of four just for the admission to Disneyland.

But brands today can do much more than command, say, a dime or two more, or even a dollar or so more, in the case of a roll of film or a box of cereal. Properly cared for, a brand can be a badge, an emblem, a global symbol that can bestow credibility and attract instant attention in a new country, a new category, a new industry. "What's the reason to trust a company in a country or in a business it knows nothing about? My God, it's the brand," says Laurel Cutler, an executive vice president at Foote Cone & Belding.

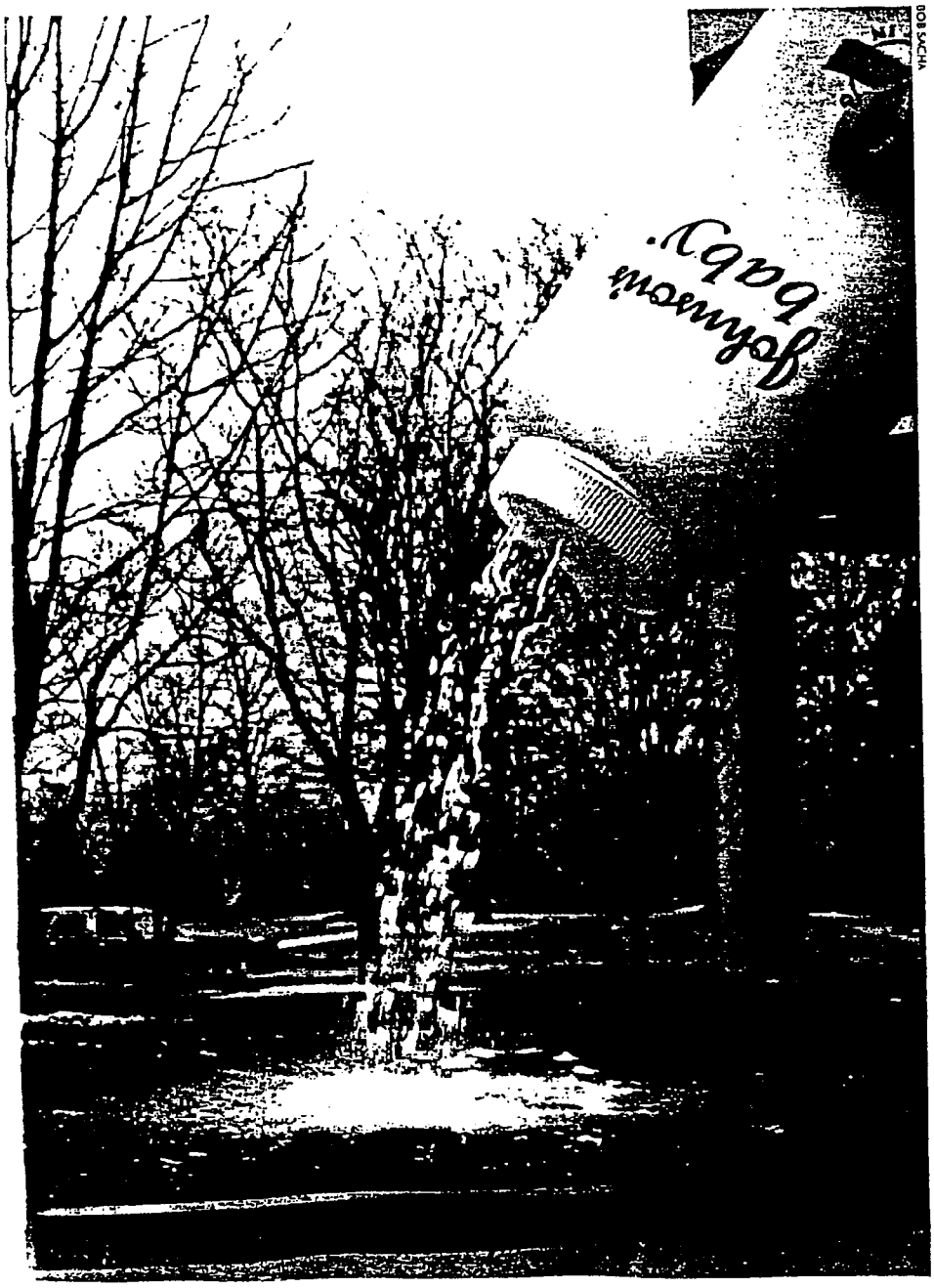
It is true that in the late Eighties and early Nineties, when brands were at their ebb,

REPORTER ASSOCIATE *Erin M. Davies*

tightfisted consumers balked at coughing up a premium for brands. Incomes were pinched, and many smart shoppers began to wonder if they were really getting extra value, or just underwriting a big company's massive advertising budget.

Now the zeitgeist is shifting. Sure, there will always be a niche market for private-label goods. But in this, the Age of Stress, a strong brand stands out as a beacon to the harried consumer, a safe haven from the daily cacophony of technologies, products, sales pitches, and media. "For me, the entire future for anyone in business is brand equity and the associations with it," says Disney's Ovitz. "The consumer is so overloaded today. There are so many messages out there. Everybody is competing for their attention. They are talking about 500 TV channels. For God's sake, the consumer can't handle 50. Anybody who said that brands were irrelevant in the 1980s will be singing the blues in the next millennium. They just won't exist."

The role brands play in the U.S. today, however, is far different than in the past. In the 1940s and 1950s, brands were revered as symbols of the good life. A Chevrolet in the driveway signified all things solid and American ("See the U.S.A. in your Chevrolet"). Disneyland opened as the "happiest place on earth." Barbie dolls represented all that little girls could grow up to become. Through the 1960s and early 1970s, brands, mirroring the economic prosperity of the time, spread a magnanimous message: Share the wealth. Virginia Slims said women could become players too; Coca-Cola gathered together people from all over the world on a hilltop in Italy in 1971 for a chorus of "I'd like to teach the world to sing in perfect harmony."



BOB SACHA

But Watergate, the oil crisis, and other political and economic shocks of the 1970s began to erode confidence in institutions. "Sliding personal incomes and a recession caused a rude awakening that there might not be enough wealth to go around after all," says J. Walker Smith, a managing partner at Yankelovich Partners, whose surveys identified many of these trends. By the competitive wheeling-and-dealing 1980s, brands had become much more of a symbol of one-upmanship. The BMW was "the ultimate driving machine," and owning one sent the message "I'm a winner, you're a loser," Smith says.

As if these epochal developments weren't bad enough for brands, along came a modest new technological development to make matters worse: the checkout scanner. The first ones were introduced in a Marsh Supermarket in Troy, Ohio, in June 1974, and within the decade had turned the packaged goods business into a free-for-all. "They were the new toys; the trade papers were filled with it. Suddenly we were able to measure weekly and daily sales by account, in smaller and smaller units," recalls Anthony Adams, a professor at Wharton and marketing consultant. Scanners illustrated to retailers and manufacturers alike the huge spikes in volume that could be generated almost instantaneously by promotional warfare: a special feature, a price cut, or a display at the end of a supermarket aisle. Spending on promotions increased, as did disillusionment with Madison Avenue. The per-

James Leneham

Head of Consumer Drugs, J&J

"If you have a brand that you know and trust, it helps you make choices faster, more easily. Can you imagine going shopping without them?"

cent of corporate America's marketing budget devoted to advertising fell.

The new technology gave retailers tremendous new muscle over the brandmakers, and with all the increased emphasis on discounts and promotions, consumers learned how to bargain. By the mid-Eighties, in a perverse twist on keeping up with the Joneses, the status of the brand became "not just about buying the BMW, but about getting it with the most features, at 20% less than the guy next door," says Yankelovich's Smith.

Brands were in trouble. And to make matters worse, corporate America was awash in the buyout boom. Big-brand makers were worrying more about acquiring each other or protecting themselves than they were about wowing consumers with new bells and whistles or low prices. They had also been lulled into complacency by both the earlier economic prosperity and America's long love affair with their brands. "Many companies were on the verge of becoming too arrogant," says Coke's Goizueta. "We are Coca-Cola, so by God, you have to have us." The private-label furor was actually just a symptom of a much bigger problem. Adds Alfred Zeien, the CEO of Gillette: "People were using brands to justify a big price differential without a significant difference in the value being offered. People were saying: 'I have a strong brand. It costs me a lot to advertise. Brand X doesn't have to advertise. I can charge more.' That is a very dangerous road to follow."

By the latter part of the 1980s, consumers were angry. They turned distinctly against brands, defining themselves not by what brands they owned but by what brands they didn't own, says Smith. And when a company tripped up—Coca-Cola with New Coke, Perrier with tainted mineral water, Intel with a flawed Pentium chip—there was hell to pay. Consumers were primed to consider alternatives such as private labels. The recession and economic hardships of the early 1990s only accelerated this trend.

Bojana Fazarinc

Marketer, Hewlett-Packard

H-P is changing from a tech-driven to a brand company. In the old days, says Fazarinc, "If we were trying to sell sushi, we would market it as cold, dead fish."

DAVID STRICK

BUT NOW America's affair with brands seems to be on the mend. Consumers better understand that a strong brand can reduce the risk of getting stuck with disappointing or faulty products, that it can make life easier. "If you have a brand that you know and trust, it helps you make choices faster, more easily. Can you imagine going shopping without them?" asks James Lenehan, worldwide chairman of Johnson & Johnson's consumer pharmaceuticals and professional group. And in the past 18 months, Yankelovich has begun to see a thaw in consumers' icy attitudes toward brands. "We see less of the 'in your face' vigilante attitude," says Smith. "In general, consumers want to trust again."

In large part, that's because companies are again making brands worth trusting. For many, the recent dark days were a harsh reminder of that most fundamental principle of brand building: that a brand has to be better than the rest of the competition. It has to deliver value. Consider the case of Gillette. The company had all sorts of problems in the 1980s, but it never stopped trying to build a better razor, perhaps because of the rude comeuppance it got back in 1962 at the hands of Wilkinson Sword. Wilkinson, which hadn't even been in the shaving business, swooped into the market with a new, coated stainless-steel blade, and Gillette lost 30% of its wet shaving business over the next three years.

NOLA LOPEZ

So now, as part of what CEO Zeien calls "the gospel from Mecca," 40% of Gillette's sales every five years must come from entirely new products. That requires about 20 new products a year. And it requires that they be authentic new products, not the kind of superficial line extensions that proliferated in the 1980s. He calls the latter the "putting blue dots in the powder" syndrome, referring to what sometimes happened with laundry detergents. "Can we say it is new and different when different means putting blue dots in it? Are we going to charge more for putting in blue dots?" These are questions he sometimes asks to chide his new-product people. The company's Sensor razor took a decade and big bucks to develop. But it was a complicated, double-bladed shaving breakthrough that's paying off greatly for Gillette.

Another part of the Gillette gospel has to do with pricing. To make sure its brands offer value, it takes a market-basket approach. The company keeps daily track of a collection of lowly items, including a newspaper, a candy bar, a can of Coke, all ranging from 10 cents to a dollar. And then it never raises its prices at a faster rate than the price of the market basket. "A lot of people argue you should charge what you can get," Zeien says. Gillette believes consumers have a relative-value consciousness. If the price of some things gets out of whack, "they feel as if they are getting ripped off."

Procter & Gamble learned about pricing the hard way as many of its biggest, most famous brands, like Pampers and Tide, got buffeted by both private-label and branded competition in the 1980s and 1990s. Hard to believe, since P&G wrote the bible on brand management. But it had gotten big and bureaucratic, and so hamstrung by its own rules that it forgot some of the basics. Prices got out of line, technology slipped, and it got sucked into a vortex of promotions and coupons. "I've been in this business for 33 years, and it seems that at least every decade, we get reminded of what this business is all about—providing a better value to consumers," says CEO John Pepper.

With the same resolve that makes its competitors quake, P&G has come storming back, with a wrenching makeover that has enabled it to bring costs down by $1.6 billion in the past four years. It plans to cut an additional $2 billion in the next four. Chastened, it has been striving for what it calls "everyday low pricing" and has brought list prices down dramatically since 1992, including cuts of 30% on Luvs, 22% for NyQuil, 9% for Tide and Cheer. It has also lit a fire under research and development. The company applied for 16,000 patents worldwide in 1995, more than double the number three years earlier. Suffice it to say that this marketing behemoth's reputation for brand-management acumen has been sufficiently restored in that Bill Gates tapped a 26-year P&G man, Robert Herbold, to help develop a better brand identity for Microsoft.

Yes, even an industry like high tech, where marketers have been way down on the corporate food chain, is fast discovering the value of a brand. Herbold's job as Microsoft's chief operating officer is multifaceted, but one particularly strong focus is increasing consumer awareness of Microsoft. A company whose boss is America's richest man and high tech's all-around poster boy has certain identity advantages, of course. But, says Herbold, "remarkably, a surprising percentage of software users don't even recognize the Microsoft name."

So Microsoft has been trying to stand out, launching Windows 95 last August with the music of Mick Jagger and Keith Richards and MTV-like advertising, and spending upwards of $200 million to flaunt its products. Awareness of Microsoft is up "significantly," Herbold says, although, he adds, "at this stage, it's still fairly low-hanging fruit."

DOWN in Silicon Valley, the "Intel Inside" logo stands as a beacon in the confusing and quickly changing world of technology. Intel Inside stands for a computer chip, for God's sake. But it is also a comfy name on a box that has somehow endeared itself to consumers, perhaps because it offers reassurance about a purchase that was most certainly fraught with confusion and anxiety. *Somebody*, after all, thought it was a good enough little piece of technology to give it a name.

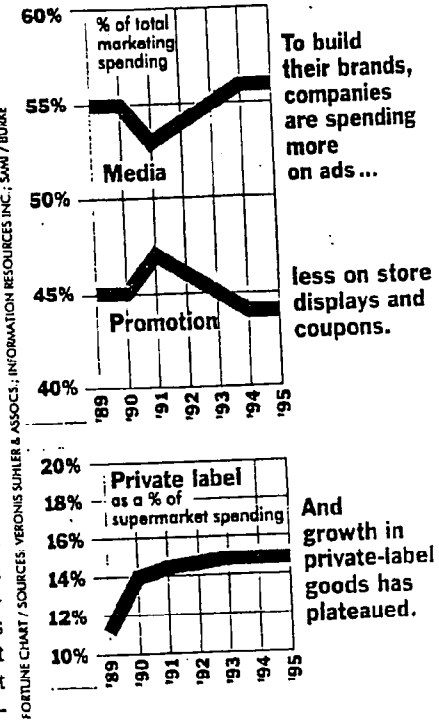
Intel Inside was born five years ago out of an identity crisis. Intel's chip had developed a brand identity throughout the industry as the "386." Intel had sued for trademark protection of the name, and fully expected to win the case. But late on a Friday afternoon in March 1991, it lost.

Dennis Carter, Intel's vice president of corporate marketing, went home to spend a long and intense weekend trying to figure out what to do. "We were in an untenable situation," he says. "In technology, where products change rapidly, the brand is doubly important—more important than in packaged goods, where a product may be more understandable because it's stayed the same for a long time."

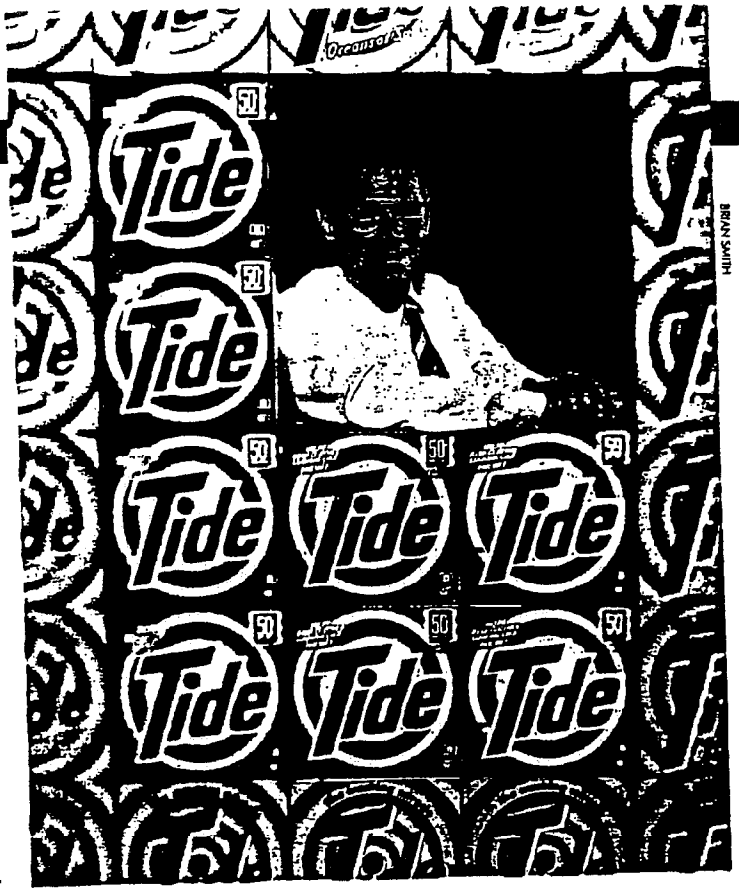
Carter spent the weekend reviewing all of Intel's marketing campaigns. Its agency had come up with the line: Intel, the computer inside. In Japan that had been successfully shortened to Intel In It. Carter had also studied the success of NutraSweet and Du Pont Teflon, both ingredients that had managed to make a name for themselves.

The following week he proposed Intel inside, and a cooperative advertising allowance for PC makers who agreed to use the logo in their own ads. The result has been one of the most successful marketing campaigns in the computer industry. Awareness of the company's chip increased from roughly 22%

BRANDS ARE BACK



FORTUNE CHART / SOURCES: VERONIS SUHLER & ASSOCS.; INFORMATION RESOURCES INC.; SAMI / BURKE



BRIAN SMITH

home-PC buyers in 1992 to more than 80% just two years later.

The high-tech crowd at Hewlett-Packard not only developed a brand, almost in spite of themselves, but then also discovered that a brand could blaze a trail into whole new markets. It was something of a revelation at a company where, as Bojana Fazarinc, H-P's corporate marketing communications manager, jokes, "In the past, if we were trying to sell sushi, we would market it as cold, dead fish." She's one of the people there whose job it has been to bring H-P out of the Dark Ages.

Over the past two years her group has put a lot of effort into determining the strength of the Hewlett-Packard name. "We had a fear that we would be considered too technical," says Fazarinc. What the company found instead "was that our foundation of technical innovation has given us an edge and a credibility."

John Pepper
CEO, Procter & Gamble
"I've been in this business for 33 years, and it seems that every decade, we get reminded what this business is all about —providing better value to consumers."

THAT'S UNDERSCORED by H-P's surprising recent success in personal computers, particularly in the home market. Testing H-P conducted before launching its Pavilion line of home PCs last August indicated that it had one of the strongest brands at retail. The affection people have for their headache-free LaserJet or DeskJet printers translated into a willingness to give H-P the benefit of the doubt in personal computers. "So basically, H-P, without having the computers themselves on the shelves, already was viewed as a leader in computer products sold at retail," says Webb McKinney, general manager of the home products division. The new line was marketed as "Not just a PC but an H-P." To the industry's surprise, it has gained the No. 5 spot in the home market over the past three months. "I think it's a great product; I don't want to denigrate it. But it really was the brand," says McKinney.

If a strong brand can be a huge asset in crossing over into brave new product worlds, it can also put you way ahead in the race to go global. McDonald's is one of the largest single-product advertisers in the world: it spent some $1.5 billion on advertising and promotion in 1994, the most recent figure. The payoff is especially evident when the Golden Arches go up overseas. After McDonald's opened its doors in Johannesburg, South Africa, a few months ago, thousands of people stood in line; some had been there overnight. South African Zulu dancers in tribal costumes performed in front of the restaurant, and a choir of local gold miners sang special songs in tribute. Says CEO Michael Quinlan: "It continually amazes me, but when we go into a new community or a new country, when we open the first day, we time and again set new sales records, new customer records. We open up with the Golden Arches; the sales team looks great in their uniforms. It is a huge event. It is a happening."

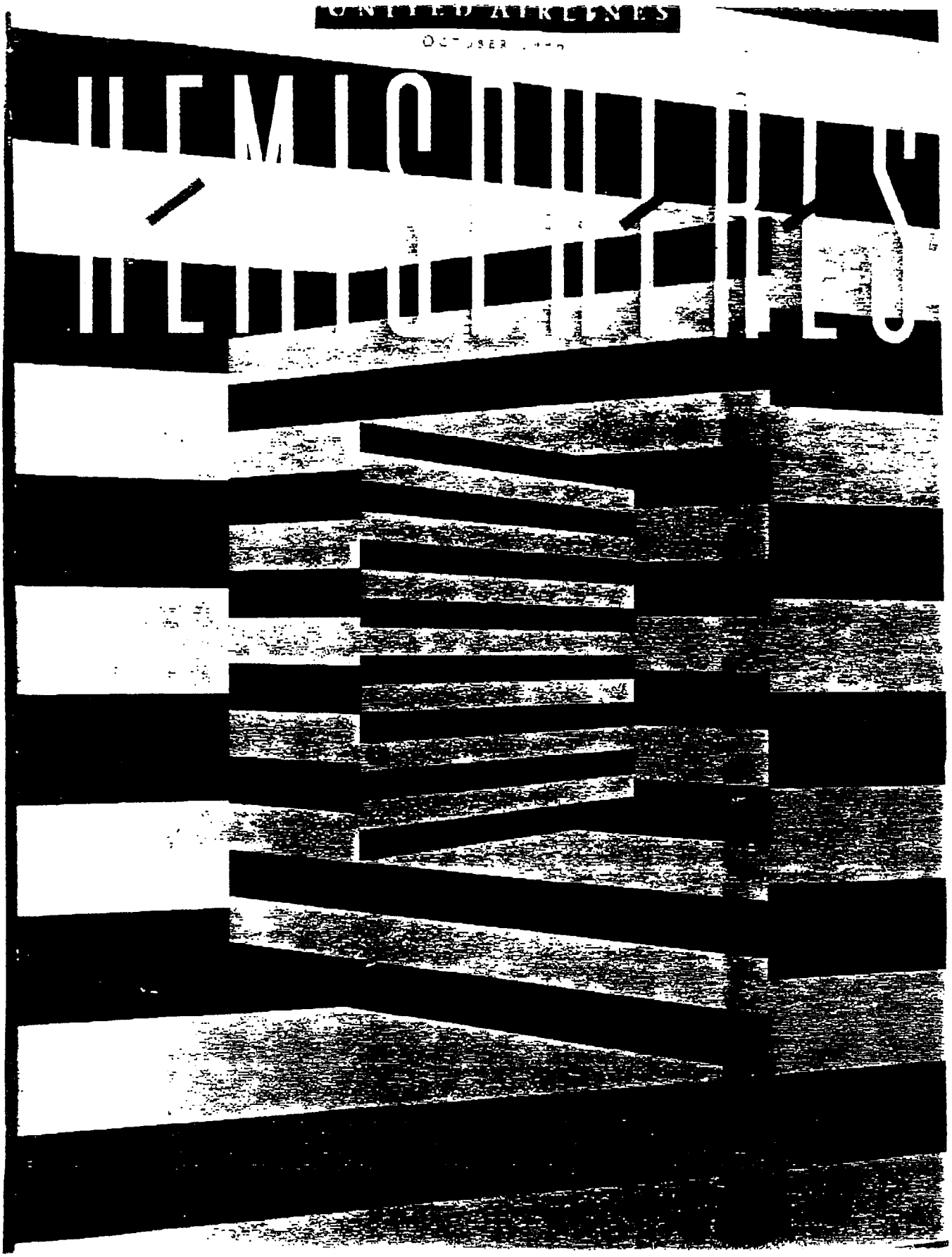
Coca-Cola knows the feeling. Just after Coke increased its presence in Poland four years ago, one of its red-and-white delivery trucks actually drew applause when it stopped at a traffic light in Warsaw. And when several of Goizueta's friends returned from Western China recently, they told him how impressed they were with all the Coca-Cola street banners they'd seen. They were mistaken, though. The cities they'd visited weren't ones where Coke has a strong presence. They had assumed it was Coke, just because the signs were red and white. Most companies can only dream of that kind of brand identity.

Coke knows, though, that no matter how strong your brand, you must stay vigilant. The company is now betting on the shape of its old hourglass bottle. Coke believes that the icon may be a powerful and instantaneous way to stand out in a world of clutter. So it has reintroduced the contour bottle in plastic and glass. It has put a picture of it on the can and plans eventually to introduce a contour can. The company is also putting contour bottles without "Coke" written on them on billboards that don't even identify the product. The aim: to generate near-instantaneous communication to consumers. Big-brand companies "will have to be far more nimble in terms of how they tailor their messages and programs to fit the way consumers are listening," says Ivester, the heir apparent to Goizueta.

Disney too has established itself as a shortcut for consumers—a safe haven, if you will, for families trying to find their way through all the dizzying changes in media and entertainment. If there was ever an example of fully integrated marketing, Disney is it. Take a movie like *Toy Story*. It got all sorts of exposure on the Disney Channel, in the Disney stores, in the Disney catalogue, and through cross-promotions with partners like Burger King. Powerful stuff. If there are kids in the house, just try to escape it. A Disney project of any sort has the ability to flash on the collective consciousness up to 425 million times in a three-month period through the company's parks, stores, films, TV programs, videos, games, and music or on the Internet, according to an internal company survey conducted last year. And that's before a dollar is spent in paid advertising or any exposure is given on its ABC network. CEO Michael Eisner calls it "the multiplier effect." The brand enhances *The Little Mermaid* and *The Little Mermaid* enhances the brand.

Almost since television was invented, people have been trying to determine how many ads we're exposed to. Media Dynamics estimated three years ago that the average adult in the U.S. is exposed to as many as 247 ads a day. That doesn't include all the myriad other messages that call out from signs and

Exhibit B-73

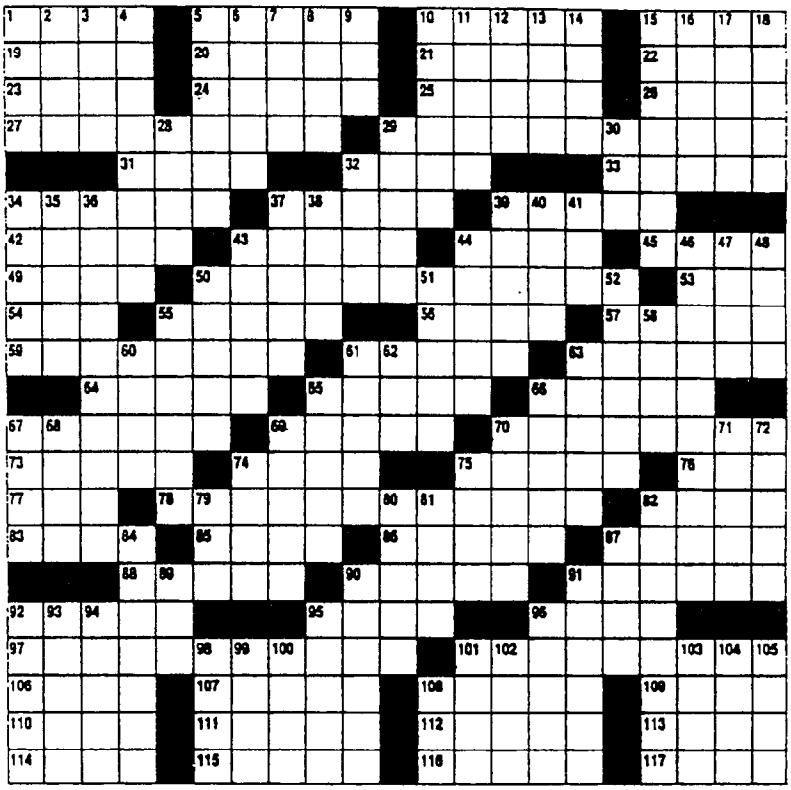

UNITED AIRLINES

CROSSWORD PUZZLE

THE RENAISSANCE

BY JOHN M. SAMSON

No dilettantes here, but true masters of learning,
in paint or in stone they described human yearning.
Keep these artists in mind as you ponder the clues.
A true child of the Renaissance will follow the muse.



Across

1 Sing like Tormé
5 Hone a razor
10 Stylish
15 Crimson Tide, for short
19 Tibetan monk
20 Emperor Selassie
21 Shin
22 Devilish
23 News flash
24 Barkin in *Sea of Love*
25 Truman's vice president
26 Drawn-out
27 *Magdalen* sculptor
29 *Annunciation* frescoist
31 Calhoun in *Red Sundown*
32 Sea swallow
33 Sing Swiss-style
34 Rosette members
37 Kind of tale
39 Temptress
42 Carroll's adventuress
43 Iraqi port
44 Shakespearean shrew
45 Rudiments
49 Caliber
50 *Pietà* sculptor
53 Alley-___
54 Hall-of-Fame Giant
55 Rich cake
56 Nonsense poet
57 ___ Dame
59 *Mona Lisa* painter
61 Beelzebub
63 Caressed
64 Peregrinates
65 Confronted
66 Diameter halves
67 Hansel's sister
69 Recluse
70 *Trinity* frescoist
73 Soda container size
74 River deposit
75 Hoity-___
76 Blunder
77 World Series mo.
78 Pisa Baptistery pulpit sculptor
82 Stephen Baldwin film
83 Bibliophile's love
85 Stage award
86 Janet of swimming
87 Tigger's creator
88 Helps with a heist
90 Surgical souvenirs
91 Gainsayer
92 Lanzhou locale
95 Strategy
96 Arm of the Amazon
97 *Henry VIII* painter
101 *Antiope* painter
106 Travel org. (abbr.)
107 *The Client* star
108 Ex-governor Alexander
109 Aladdin's loss
110 British gun
111 Hair tint
112 Poetic Muse
113 *The Time Machine* people
114 Sniggler's catch
115 Beaverlike
116 Scatter
117 Copenhagen citizen

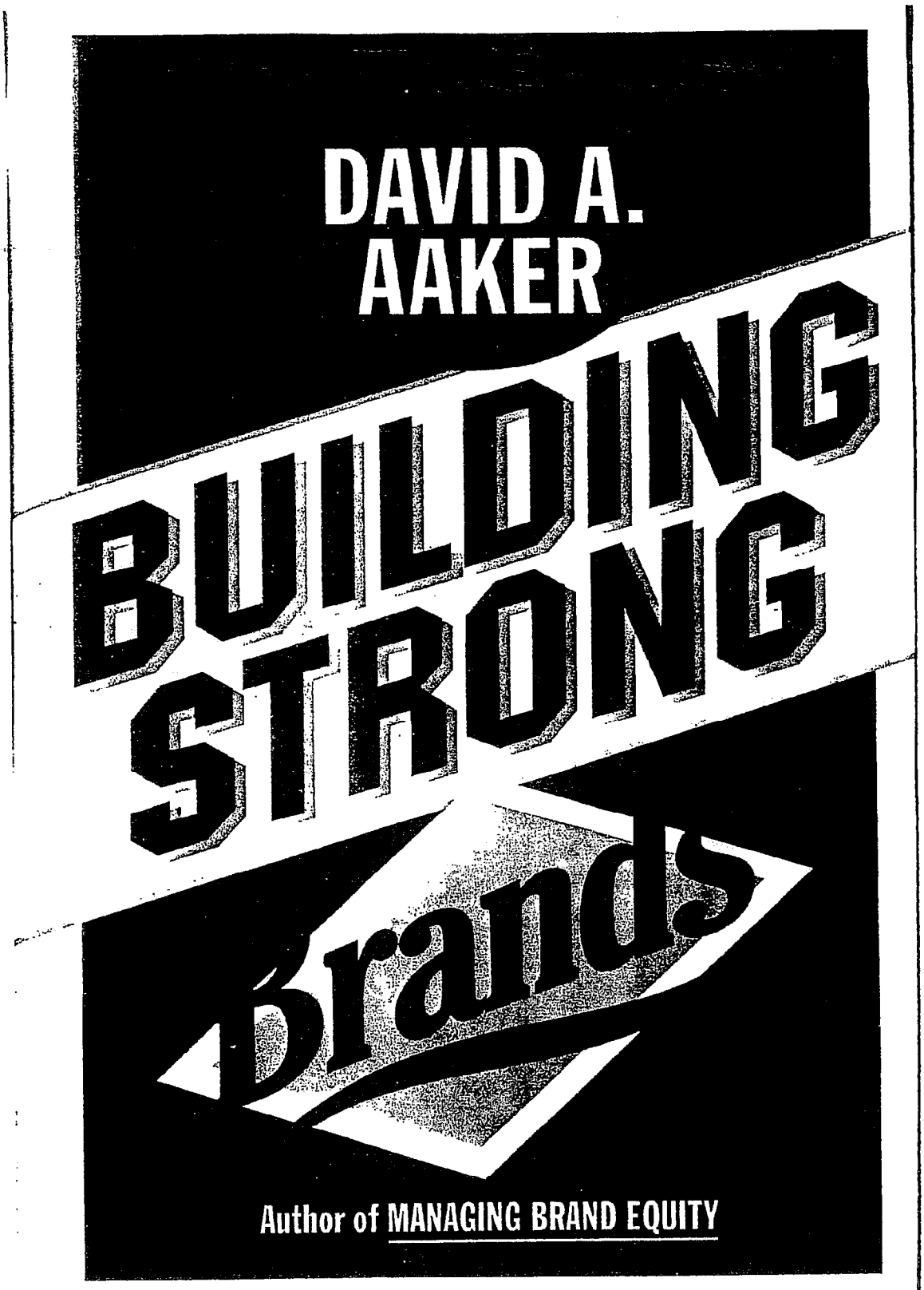
Downs

1 Lost traction
2 Clouseau's valet
3 Church corner
4 American larch
5 See-through curtains
6 Calculate
7 Brooklet
8 Butter alternative
9 Female swan
10 Like van Gogh's night
11 Where to see the *Last Supper*
12 *SOS* group
13 Nothing, in Nice
14 Hotness
15 Wife of Mars
16 Bypass
17 Shred
18 Star in Perseus
28 Lacquered metalware
29 Untamed
30 Look
32 Spare item
34 Oral
35 Transport
36 *Paradise* painter
37 Ipso ___
38 Tennis great
39 *Dragons of Eden* author
40 Anatomical canal
41 Electrical unit
43 Kookaburra and cuckoo
44 Work dough
46 *The Birth of Venus* painter
47 Nucleus
48 Zipped
50 Gourmet mushroom
51 Change
52 TV's ___ *at a Time*
55 Alehouse
58 Of the ear
60 Jot down
61 Stocking stuffer
62 Kind of bandage
63 City of SW Colombia
65 Lunacy
66 *The Invisible Man* star
67 Lump of clay
68 *Miami Vice* hero
69 Detroit team
70 Complains
71 Papas in *Z*
72 Law partner
74 Ayr resident
75 Potentate
79 Mineral suffix
80 State tree of Texas
81 Catcher Rodriguez
82 Wangled
84 Jayhawkers
87 No more than
89 Pooh-___
90 Tricky pitch
91 Monkey Trial lawyer
92 *Funny Farm* star
93 Hurry-scurry
94 Pentium manufacturer
95 Intrinsically
96 Palaver
98 German river
99 *Star Wars* princess
100 ___-up job
101 Links transport
102 Poet Khayyám
103 Fiesta
104 ___ *Fire* Springsteen
105 Mayberry moppet
108 Paul or Brown

Solution on Page 131

OCTOBER 1996

Exhibit B-74


DAVID A.
AAKER
BUILDING
STRONG
Brands
Author of MANAGING BRAND EQUITY


AAKER BUILDING STRONG BRANDS
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CIP

INTEL INSIDE

Intel makes microprocessors, which are the heart of personal computers. Their successive product generations were called the 8086, 286, 386, and 486 microprocessors. Unfortunately, Intel did not obtain trademark protection on its numbering system, and thus the 386 and 486 names were available to competitors such as AMD, Chips and Technologies, and Cyrix who made their own chips and applied the X86 name to them.

Intel responded in 1991 by encouraging computer firms like IBM, Compaq, Gateway, and Dell to put the "Intel Inside" logo in their ads and on their packages. The enticement was a cooperative advertising allowance from Intel amounting to 3 percent of the companies' Intel purchases (5 percent if they used the logo on packaging). An Intel Inside ad is shown in Figure 1–4.

The campaign, which was initially budgeted at $100 million per year, worked on several levels. It generated more than ninety thousand pages of ads in an eighteen-month period, which translated to a potential 10 billion exposures. During that period, the recognition of Intel among business end users increased from 46 percent to 80 percent, the same level that Nutrasweet enjoyed among consumers after years of exposure of the Nutrasweet logo. The brand equity of Intel, as measured by the price discount needed to get a customer to accept a computer without an Intel microprocessor, appeared to be positively affected. During 1992, the first full year of the Intel Inside campaign, Intel's worldwide sales rose 63 percent.

Why should the Intel Inside program make a difference to consumers? No reason was provided as to why an Intel microprocessor is

graph. For example, the recall and recognition of each of twenty automobile brands could be measured, and these measurements could be used to position each brand on the graph. One finding consistent across dozens of product classes is that brands tend to follow the curved line shown in the figure. There are two exceptions, each of which reveals the importance of recall.

One exception is healthy niche brands, which fall below the line because they are not known to a substantial group of consumers, and therefore have relatively low overall recognition. But because they do

better. In fact, it is likely that many customers did not even know what a microprocessor was.

A customer's logic might have been something like this: Computer makers, including industry leaders like IBM and Compaq, are expending a lot of money and effort to tell me that Intel makes a part of this computer. These people are not dumb. Therefore the component must be an important one, and Intel must be a good supplier. I could do some research to determine what a microprocessor is and how much better Intel is than its competitors, or I could just pay a little more and get Intel. An easy decision—I will simply rely on the reassurance of the Intel brand name.

Interestingly, the Intel Inside campaign actually originated in Japan, where Matsushita used it as a way to build high-tech credibility for its computers. Japan is a country in which the prestige and visibility of corporate names is extremely important. By building up the Intel corporate name, Matsushita created credibility for itself.

(A postscript: The Pentium chip, which succeeded the 486 in late 1994, was found to make some arithmetic errors under certain conditions. Instead of immediately acknowledging the error and offering to replace the involved products—few customers may have actually gone through the bother—Intel claimed the problem was rare and could be ignored. Intel belatedly did adopt a customer-oriented return policy, but only after a storm of damaging protest from the press and the public. Because Intel's equity was based on awareness and the presumption that a customer did not have to know what happens "inside," the incident had considerable potential for damage. Although initial sales were not affected, recovering from the incident presents a challenge for Intel.)

have high recall among their respective loyal customer groups, their low recognition is not necessarily an indication of poor performance. And healthy niche players sometimes have the potential to expand recognition and thus the scope of their customer base.

The second exception is the graveyard, an area in the upper-left-hand corner populated by brands with high recognition but low recall. Being in the graveyard can be deadly: Customers know about the brand, but it will not come to mind when considering a purchase. Breaking out of the graveyard can actually be hindered by high recog-

FIGURE 1–4
Intel Inside Ad

much more would you pay to be able to buy a Toyota Camry instead of a Honda Accord?"

A more sensitive and reliable measure of price premium, however, can be obtained using conjoint or trade-off analysis. This well-developed market research approach presents consumers with a series of simple choices, which are then analyzed together in order to determine the importance of different dimensions to consumers. For example, consumers might first be asked, "Would you prefer a Toyota Corolla at $14,000, a Honda Civic at $13,000, a Saturn at $12,500, or a Chrysler Neon at $12,000?" If the Saturn is selected, then the process is repeated, but this time with the Saturn priced at $13,000. If the Civic is then chosen, the next set will include the Civic with a $13,500 price. The value of the brand emerges from such a study.

The Best Single Measure of Brand Equity?

The price premium may be the best single measure of brand equity available, because it directly captures the loyalty of customers in a most relevant way. If they are loyal, they should logically be willing to pay a price premium; if they are not willing to pay more, the loyalty level is shallow. Indeed, as noted above, Allstate's research to identify the key drivers of its brand equity focused on what variables influenced the price premium.

There is a natural desire to obtain an estimate of the financial value of a brand. Knowing the brand's value helps to calibrate brand-building investments, and changes in value can assist in the evaluation of marketing programs. One convenient aspect of the price premium is that it can be the basis for a crude estimate of brand value (the price premium associated with existing customers, multiplied by unit sales).

Of course, distribution channel realities may prevent the price premium from affecting the brand's price in the marketplace. Whereas many customers might be willing to pay a 10 percent premium to obtain Coke, the price-sensitive segment and aggressive retailers may make the realization of this price premium in the supermarket infeasible. Nevertheless, the price-premium-based brand value estimate can be helpful.

Intel is one firm that tracks its price premium. Every week, interviewers are in computer stores asking people how much of a discount would be needed before a customer would feel comfortable buying a

Goodyear, and Coke), brand equity had about the same impact on stock return as did return on investment, the accounting value known to be associated with stock market movement. This relationship was found even after controlling for both advertising expenditures and awareness.

INTERBRAND'S TOP BRANDS

Interbrand, a UK-based branding consulting company, used a very different approach to identify the strongest brands in the world. Its a set of criteria, chosen subjectively, included the business prospects of the brand and the brand's market environment, as well as consumer perceptions. Five hundred brands were evaluated based on seven criteria:

1. *Leadership*. A brand that leads its market sector is more stable and powerful than the second-, third-, and fourth-place brands. This criterion reflects economies of scale for the first-place brand in communication and distribution, as well as the problems that also-rans have in maintaining distribution and avoiding price erosion.
2. *Stability*. Long-lived brands with identities that have become part of the fabric of the market—and even the culture—are particularly powerful and valuable.
3. *Market*. Brands are more valuable when they are in markets with growing or stable sales levels and a price structure in which successful firms can be profitable. Some markets, such as frozen dinners and some areas of consumer electronics, are so rife with debilitating price competition that the prospects of any brand being profitable are dim.
4. *International*. Brands that are international are more valuable than national or regional brands, in part because of economies of scale. More generally, the broader the market scope of a brand, the more valuable it is; a national brand is worth more than a regional brand.
5. *Trend*. The overall long-term trend of the brand in terms of sales can be expected to reflect future prospects. A healthy, growing brand indicates that it remains contemporary and relevant to consumers.

6. *Support*. Brands that have received consistent investment and focused support are regarded as stronger than those that have not. However, the quality of support should be considered along with the level of support.
7. *Protection*. The strength and breadth of a brand's legal trademark protection is critical to the brand's strength.

Based upon these criteria, Interbrand determined that the top ten brands in the world in 1990 were as follows:

1. Coca-Cola
2. Kellogg's
3. McDonald's
4. Kodak
5. Marlboro
6. IBM
7. American Express
8. Sony
9. Mercedes-Benz
10. Nescafé

The business-oriented (versus consumer-oriented) view of the Interbrand criteria is useful in part because it is a step closer to putting a financial value on the brand—in fact, Interbrand uses its brand ratings to determine a multiplier to apply to earnings. The subjectivity of both the criteria and the assessment of the brands, however, makes the dimensions difficult to defend and affects the reliability of the resulting measures.

It is easy to challenge the assumptions reflected in the dimensions. Small niche brands, for instance, may be more profitable than so-called leadership brands. Older brands may lose their brand strength. The ability of a market to create or protect margins is difficult to project. A local brand can have advantages in connecting with customers, and thus it may be more profitable than an international brand that must deal with substantial coordination problems. Growth in brand sales, especially if obtained by sacrificing margins, is not necessarily healthy. Further, the Interbrand system does not consider the potential of the brand to support extensions into other product classes. Brand support may be ineffective; spending money on advertising does necessarily indicate effective brand building. Trademark protection, although necessary, does not of itself create brand value.

WHY MEASURE BRAND EQUITY ACROSS PRODUCTS AND MARKETS?

What is a stronger brand name—Kodak, American Express, Mercedes, Ford, or IBM? Why is a brand strong or weak? How is the

Exhibit B-75

John Neff: Stocks Could Fall 20%

Why CEOs Are Learning to Love Mergers

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INTEL

Andy Grove's Amazing Profit Machine

–and his plan for five more years of explosive growth

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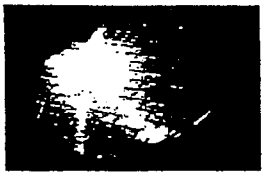


Intel's Amazing Profit Machine

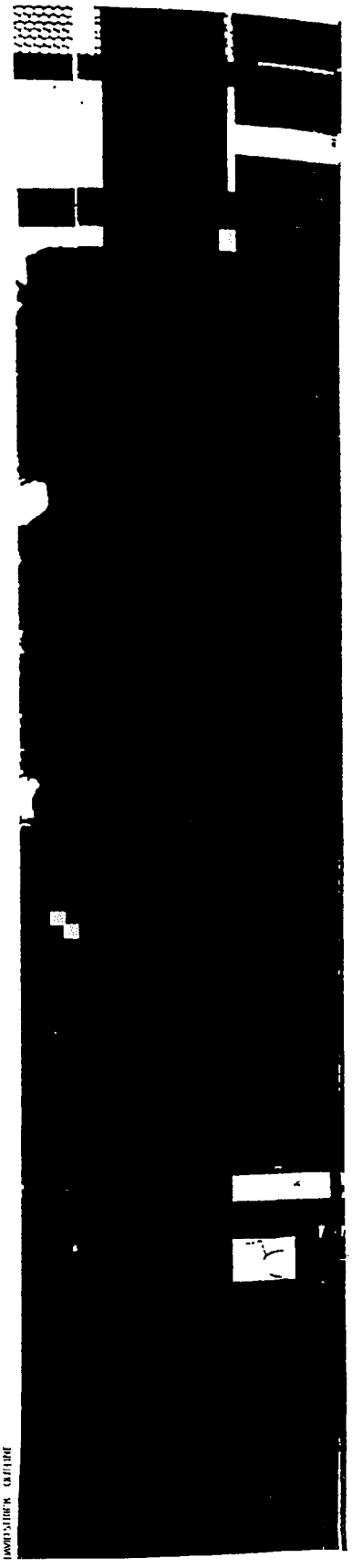
In the past five years, CEO Andy Grove has redefined his company, transforming it from a maker of chips into an industry leader. The result: Intel is poised for another five years of explosive growth.

by David Kirkpatrick

After the close of trading on January 14, the world's leading manufacturer of computer chips stunned no one by announcing record 1996 earnings of $5.2 billion on sales of $20.8 billion. Shareholders have grown accustomed to that kind of performance from Andy Grove's Intel. Since Grove took over as CEO in January 1987, Intel's average annual return to investors has been an astounding 44%.

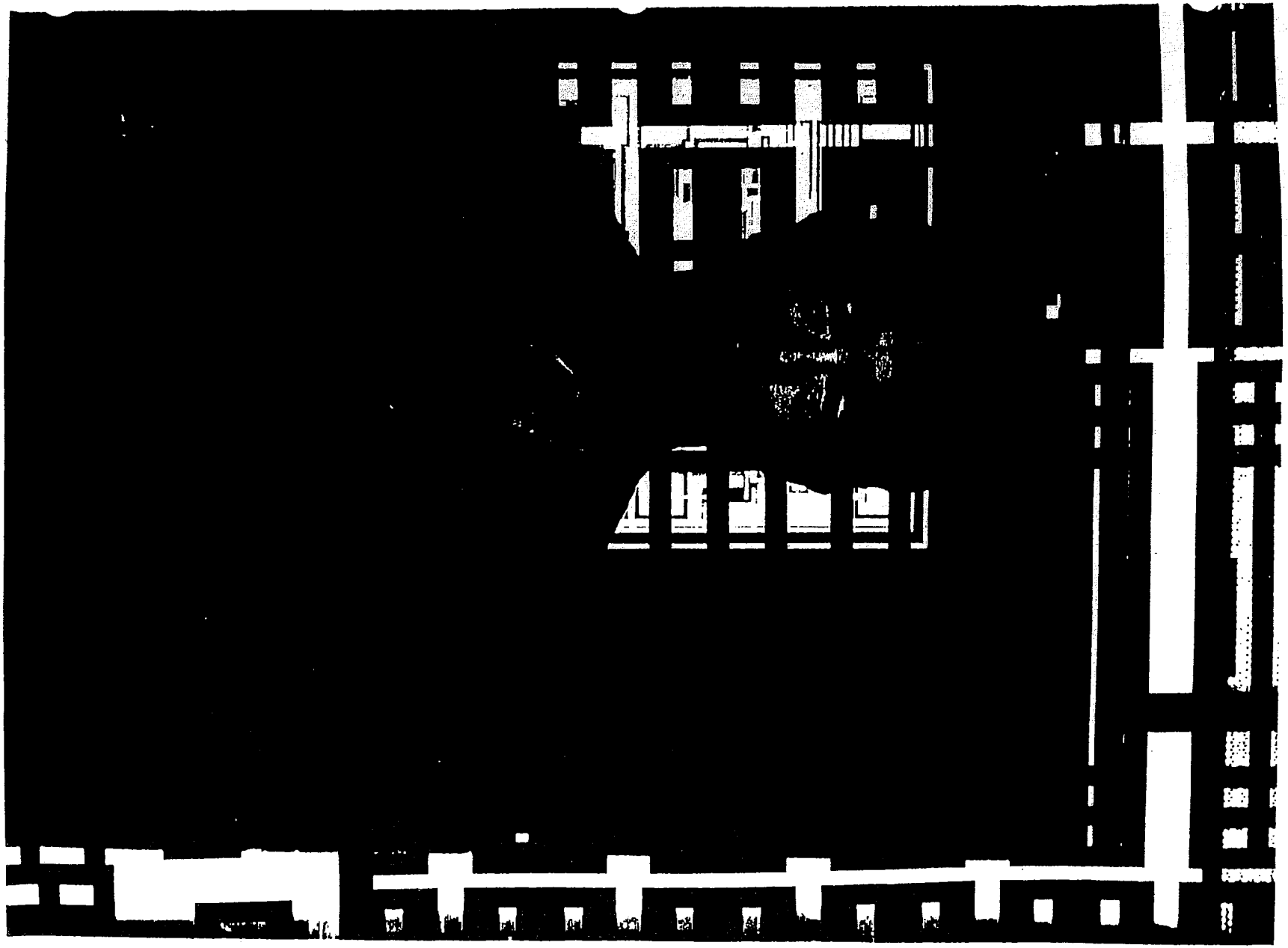
More revealing than the earnings report was an executive-suite shuffle announced a day earlier. On May 21, Grove will become chairman, replacing Gordon Moore, who founded the company with Robert Noyce, the co-inventor of the integrated circuit. The shift is largely symbolic: Moore will continue to work three days a week, and Grove will continue to run the place, as he has for years. But the announcement did make one thing perfectly clear: Andy Grove now operates in no man's shadow.

To understand the significance of the move, you must know that in the storied past of Intel, one idea looms largest: Moore's prescient prediction in 1975 that the power of a computer



The CEO

Andy Grove wants to make the PC the central appliance in your life, so that you buy more of his chips (like the Pentiums on the silicon wafer shown above).

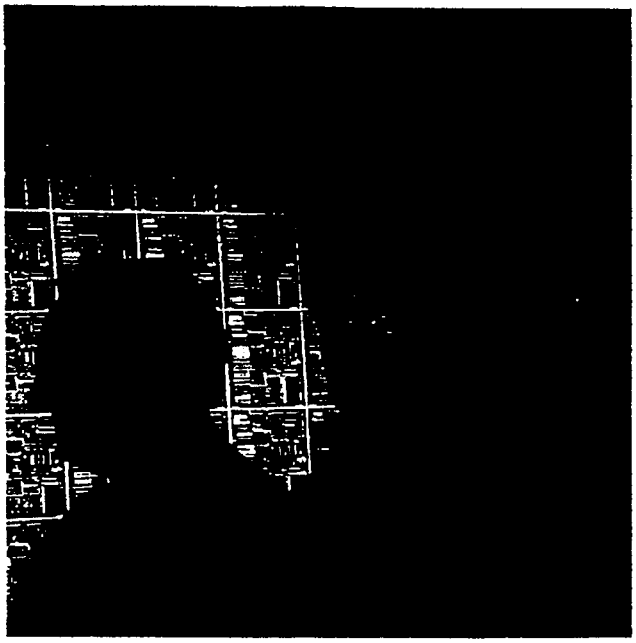


chip would double every 18 months. What CEO Grove has done for the past ten years is to deliver brilliantly on the promise of that "law." Intel has consistently been the company to supply PC manufacturers with the hot chips they need to power each generation of new, exciting PCs. Its competitors—among those that have survived are Advanced Micro Devices (AMD) and Cyrix—are little more than also-rans. Intel microprocessors power more than 80% of all PCs in the world.

But Moore's law is not a law of physics. It is, says Albert Yu, Intel's general manager for microprocessor products, "a law of technology and business." So far, Moore's law has been sustained by a regular cycle: Computer makers and software companies (especially Microsoft) develop new features and programs that require more power. Intel, meanwhile, creates brawny new chips to meet those new demands. Selling chips at prices high enough to earn gross margins now hovering around 60%, Intel uses its profits to build new chip factories, which presently cost some $2 billion a pop—thus readying itself for the next turn of the cycle. Predictable enough in recent years, yes; immutable, no. Says Yu: "This thing could stop. If people don't buy a chip with more functions, there's no money to develop the next round."

The famously worried Grove—author of the current business best-seller, *Only the Paranoid Survive*—came to appreciate this fully only a few years ago. He decided that basing the business on the premise that others would create demand for microprocessors was suicidal. What if Microsoft, say, shifted its R&D from developing next-generation software to making its current products work more efficiently on today's PCs? Fewer people would want new machines powered by Intel's hot, new, expensive chips.

So Grove embarked on a radical approach to stay ahead of competitors and keep Intel growing. In recent years he has molded the giant chipmaker into much more than a supplier of parts. It now aims to be the visionary leader of the entire computer industry. From here on, Grove declares, Intel will create the demand. He explains: "If we don't make computers more useful, there won't be demand for the chips we'll be making in a few years. So we have to create users and uses for our microprocessors. We get the market growth we earn—by our development efforts, our investments, and our proselytization. That's absolutely in our psyche now."



The Heir Apparent

President-designate Craig Barrett is a no-nonsense manager and an avid outdoorsman.

Intel's transformation is a personal triumph for Grove, 60. Even though he was one of the handful of employees who got the company up and running in 1968, Grove has never been considered a founder—a status reserved for Moore and Noyce. They have been celebrated as legends and visionaries, aided in their success by Andy Grove, the efficient manager. But now he must be considered their equal. Says Regis McKenna, the Silicon Valley marketing pioneer who worked closely with Intel's management in the early days: "Intel in the past was fairly conservative. But today it's much more willing to take leading-edge positions, because Andy realized Intel has the power to create the market. He may be the best manager in the world. He has achieved as a manager the stature held by Noyce and Moore in the past as inventors."

For the past five years Grove has pursued a series of projects that seem to have little to do with making chips. He's been spending time in Hollywood, chatting with the kind of moguls that hobnob at Herb Allen's Sun Valley, Idaho, summer get-together; quietly investing in a range of small companies that do things as esoteric as construct 3-D interactive "worlds" on the Internet, even trying to help Starbucks set up a video-conferencing network for its customers. Grove's peregrinations have sometimes seemed puzzling, but now the reason for them is clear. To ensure Intel's success over the coming five years, he has been maneuvering to make the PC the central appliance in our lives. In Grove's vision, we will use PCs to watch TV, to play complex games on the Internet, to store and edit family photos, to manage the appliances in our homes, and to stay in regular video contact with family, friends, and co-workers. If Grove's vision comes to pass, Intel will thrive. If it doesn't, Intel's strategy falls apart.

"Intel is on a treadmill of new-product introductions fed by increasing demand for microprocessors," says Scott Randall, a security analyst at SoundView Financial in Stamford, Connecticut. "The day that treadmill slows down is the day their business plan has to be rethought." That's why Grove has boosted the budget for projects that contribute to market development but have nothing directly to do

"Andy realized Intel has the power to create the market. He may be **the best manager in the world,**" says Regis McKenna. "Grove has achieved as a manager the stature held by Noyce and Moore in the past as inventors."

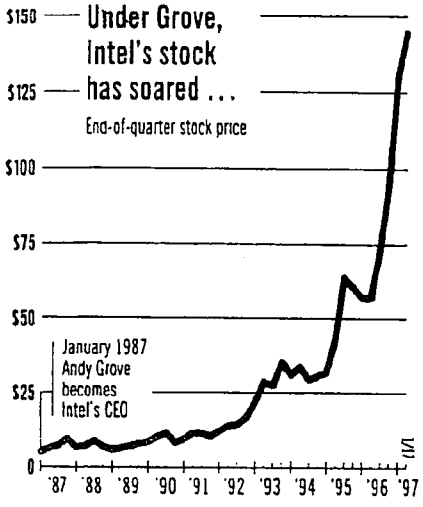
with microprocessors. Such spending has gone from zero in 1990 to more than $500 million in 1996. Intel is the only company in the computer hardware business that can afford that kind of money: Its earnings exceed the aggregate profits of the top ten PC manufacturers *combined.*

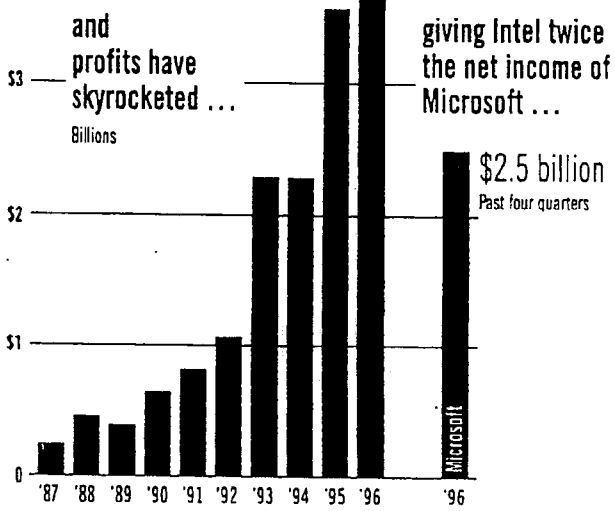
Intel does exactly one thing that no competitor can match: build state-of-the-art microprocessors in quantities of tens of millions. Intel continually improves its chip designs: more to the point, it is the only manufacturer that can afford to keep building the gargantuan plants required to make them. In 1996, Intel spent $5 billion on capital projects and R&D; every nine months or so it puts up a new chip plant, or "fab," each a $2 billion bet on the future. Explains Craig Barrett, who was named president on January 13: "We build factories two years in advance of needing them, before we have the products to run in them, and before we know the industry's going to grow." Says Grove: "Our fabs are fields of dreams. We build them and hope people will come."

Not that Grove lacks a road map of the technological future. At the Comdex computer trade show in Las Vegas last November, he stood before 7,000 attendees and confidently described the Intel chip of 2011. Today's Pentium Pro microprocessor contains 5.5 million transistors; Intel chips then will pack a cool billion. Today's top clock speed of 200 megahertz will soar to ten gigahertz (or 10,000 megahertz). Last year Intel sold about 60 million processors; by 2011 it hopes to be selling many hundreds of millions annually. Says Michael Slater, publisher of *Microprocessor Report*: "I see no clear technology threats. The biggest long-term threat to Intel is that the market growth slows."

That is the threat that worries Grove. When Intel introduces a new microprocessor (the Pentium Pro is the latest), chips from the first wave of production sell for as much as $1,000 each. They power

The Astounding Numbers at Andy Grove's Intel





and making Intel one of the top earners of the FORTUNE 500.

Company	1996 profits in millions	% change 1995–96
Exxon	$7,510	16%
General Electric	$7,280	11%
Philip Morris[1]	$6,246	15%
IBM	$5,429	30%
Intel	**$5,157**	**45%**
General Motors[1,2]	$4,289	–38%
Ford[1]	$3,868	6%
Merck[1]	$3,833	15%
Citicorp	$3,788	9%
Du Pont[1]	$3,750	1%

[1]Estimate. [2]General Motors spun off EDS.

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FORTUNE CHARTS

top-of-the-line PCs and servers, which tend to be purchased by early adopters, technophiles who just can't wait. As Intel increases production, it lowers the price, stopping somewhere just north of $200 when the chip is the hot mass-market processor. That figure is low enough to ensure unit sales in the multimillions but high enough to secure huge margins.

Even at that price, Intel chips are expensive enough that PC manufacturers must charge at least $1,500 per machine to earn a profit. Says Slater: "Intel's business model is dependent on selling processors for in excess of $200, so they are also dependent on $1,500 PCs being predominant." Consumers will spend that kind of money only if they're persuaded that a new PC will help them do very cool things.

That's one reason Intel needs to make sure that the PC remains a cutting-edge device. The other reason is that Intel can't get away with charging $200 a chip for very long. Eventually its competitors catch up technologically and undersell Intel. Intel does then lower prices, of course. But it must also have its next-generation chip ready, to begin the cycle anew and keep margins high. Says Marc Schulman of Technology Strategies consulting firm in Stamford, Connecticut: "Intel is in the same position as auto manufacturers who want us to buy a new car every three years. It's planned obsolescence."

The business model allows little margin for error, which is why Intel can no longer afford to rely on others to create demand for PCs. Around 1990, Grove started moving the company from being an industry follower to a leader. Intel's 486 chip had started to catch on, but a potential problem was threatening to stall the next generation (later named Pentium): The speed of the microprocessor was starting to outpace the performance of the rest of the machine. The existing "bus," the internal network that directs electrons around the computer, would serve data at a rate far slower than the Pentium chip would be able to handle. Consumers might buy a PC to get the power of a Pentium and be disappointed.

Until then, bus designs had come from IBM or other PC makers. In 1990, however, Grove knew of no sufficiently fast designs in development. An Intel division had a proposal for a bus called PCI, but Grove didn't think Intel should get involved. "The notion that we would step forward and initiate a re-architecting of the computer for me was very strange," Grove recalls. "Where did we get off doing buses? I remember having a very heated argument with the executive who was pushing for it. But finally he convinced us that if we didn't do it, a new bus wouldn't become accepted." Today PCI is the standard bus on PCs.

The bus decision set the stage for what Grove calls his epiphany. At Comdex in 1991, Grove delivered a keynote speech involving what he referred to at the time as the "mother of all demos." He showed how a notebook PC equipped with PCI and special computer chips could receive E-mail messages and graphics delivered over a wireless network. At the time, that was a real breakthrough. Dell, IBM, and other companies endorsed the vision, and sent representatives to appear with Grove onstage. The demo was a smashing success. Grove was amazed at his company's ability to stage-manage so many players. He realized that this kind of leadership could become Intel's key competitive strength. "That was the 'Aha!' for me," he says.

> "Intel is **on a treadmill of new-product introductions** fed by increasing demand for microprocessors," says an analyst. "The day that treadmill **slows down** is the day their business plan needs to be rethought."

Around that time, Grove visited his friend Steve Jobs, who had left Apple Computer to found Next (which Apple recently announced it would purchase). Next was building a high-performance but pricey computer specially tuned for multimedia applications and ease of use. Jobs demonstrated the machine for his friend, and Grove returned to Intel inspired. Says Frank Gill, an Intel executive vice president: "Andy came back and said, 'I want you guys to do that same kind of development for the entire industry, to make PCs as good as the Next computer.' "

Five years later, the fruits of that effort are visible:

THE LABORATORY. In 1991, Grove created the Intel Architecture Labs (IAL) in Hillsboro, Oregon, an R&D operation focused on the PC. The labs now house about 600 employees—mostly programmers—in two vast buildings set on flat farmland 25 miles west of Portland. Says director Craig Kinnie: "Our primary objective is to grow the market for all products, not just Intel products."

Many of the labs' projects involve creating new software. One project aims to make it easier for Websites to deliver video via the Internet. Intel programmers created something called the Streaming Media Viewer, which software makers can incorporate into their products so that consumers can view video as it arrives from the Web. For $199, any Website owner can buy an IAL-designed add-in circuit card that enables the site's computer to broadcast video. But guess what—the card will work properly only with a fast microprocessor.

IAL software is also helping popularize Internet telephony. Many small companies, like VocalTec and Quarterdeck, sell programs that let PC owners make long-distance voice calls via the Internet. For the most part, such products have been incompatible, limiting the number of people you could reach if you used one. IAL helped develop a new way to make calls, worked with the Internet industry to get it adopted as a standard, then gave away Intel software that met the standard. It also licensed the software to Microsoft, which gives it away on its Website. The moves forced VocalTec and the other telephony companies to modify their software to meet Intel's standard. Soon most Internet phones will be able to talk to each other. Crows Gill: "Until we took a role in driving the standards, Internet telephones were largely toys. Now there's an industry consensus around this specification."

Next Intel will promote software that it has designed for Internet videophones. Intel expects that manufacturers will build this function into PCs this year. If that happens, people who buy a high-powered PC this fall will get a feature that only three years ago required special hardware, like the videophone that AT&T sold for $1,000. That kind of innovation could persuade users to keep paying $1,500 or more every few years for a new PC.

GROVE IN HOLLYWOOD. On December 12, Grove & Co. made a glitzy Hollywood debut with the launch of the CAA Media Lab. A windowless, high-concept cave, the lab is housed in the Beverly Hills head-

quarters of the Creative Artists' Agency—Michael Ovitz's old hangout and still one of the most powerful forces in entertainment. The media lab is designed to show what the PC can do as a display medium and as a tool for the creation of new kinds of content. CAA plans to shuttle stars, musicians, directors, and other "talent" through the lab for tutorials.

At the gala opening, a couple of Intel execs chatted up *Cheers* veteran–turned –Larry Flynt impersonator Woody Harrelson. Later, in the lab's stylish mock living room, jazz musician Herbie Hancock and CEO of database maker Informix, Phil White, sat down together to watch an interactive digital promo starring Danny DeVito. DeVito conveyed Intel's seductive pitch—that technology now enables entertainers to communicate with consumers without a big studio as intermediary. "On the Net you can go direct to your fans," DeVito's digitized image told the talent from behind a digital cigar. "All kinds of media are getting married, and they're having a baby—a very lucrative baby."

Intel is the only manufacturer that can afford **the gargantuan plants required to make millions of microprocessors.** Every nine months or so, it builds a new chip "fab," each a $2 billion bet on the future.

Ron Whittier, Intel's point man on the media lab, is senior vice president in charge of content. He spends all his time figuring out ways to get compelling material—for entertainment, leisure, and business—ready for future generations of PCs. "The media and software industries have to be in sync with the platform," he says. "Otherwise it affects our time line for selling processors." Adds Avram Miller, Intel's director of business development: "I want people in Hollywood to understand that the time is now. The PC in the home will have higher production values—advanced graphics, higher resolution, and more interactivity—than any other platform." Television manufacturers, watch your wallets.

INTEL, VENTURE CAPITALIST. Intel now owns shares in over 50 companies, and the total market value of its investments exceeds half a billion dollars. Some of the companies in which it has a stake are the Palace, which creates virtual communities on the Internet; Digital Planet, which has developed episodic, interactive stories on the Web; and Willisville, a tiny outfit that is looking to combine shopping, chat, and storytelling online. Says Grove: "We make media investments in order to lure the companies into our infrastructure, into our world."

One of Intel's biggest media holdings is in CNET, which runs Internet sites and produces broadcast TV shows devoted to technology. Last July, just before CNET went public, Intel paid a little under $9 million for a 4.5% stake; it is now worth some $17 million. Intel helps CNET in a variety of ways. For instance, the companies are working together on Mediadome, a Website that made its debut on New Year's Eve. It aims to show off the most up-to-the-minute combinations of media and technology with such events as live Webcasts of technology-enhanced concerts. Intel brings in the talent, as well as movie and television properties that can be adapted into "Webisodes." "We work very, very closely with Intel," says CNET CEO Halsey Minor.

As a venture capitalist, Intel is aggressive, willing to spend on some pretty esoteric projects if there's a chance they might spark demand for the processing power only Intel can provide. Says an executive at a big PC company that also invests in

The Content Guy

Ron Whittier helped Intel set up this media lab, located within the offices of the Creative Artists' Agency in Beverly Hills.

new-media startups: "Intel gets there before us all the time in venture deals. You go, 'How did they do that?' "

One example: This year Grove embraced OZ Interactive, a small San Francisco outfit that specializes in 3-D Internet software. The firm defines itself in a press release as "scientists aspiring to art and artists hacking code." Grove is so impressed by OZ that he took Skuli Mogensen, the company's 28-year-old Icelandic president, to last summer's Allen & Co. media executive retreat at Sun Valley. Mogensen explains his product: "It's a browser that enables you to walk around in 3-D spaces and meet other people. You can create your own persona, change clothes, be a woman or a monster, or talk like a woman or a monster." Sound esoteric? Grove doesn't think so: He gave OZ early access to PCs equipped with Intel's new MMX multimedia technology, to ensure that OZ software was ready to roll when Intel introduced MMX in January.

Other PC development projects are even further removed from Intel's core activities. One example is systems integration. Intel is talking to Walt Disney about new ways of distributing its content electronically. It is designing an electronic videoconferencing network for the World Economic Forum, an influential group of CEOs and government leaders. And it is in the late stages of discussion with Starbucks about building a high-bandwidth network that would link together selected cafés. The companies are coy about providing details, but soon you may be able to send and receive video E-mail while sipping your latte at Starbucks.

Grove is particularly interested in pushing digital photography (see Digital Watch). "This is a big job for microprocessors," he says. "We want to take a lot of expense out of digital cameras and make picture taking less complex than it is today. We'll be working with Kodak, Konica, Sony, and Hewlett-Packard, among others." He's also focusing resources on Asia, Intel's fastest-growing market, to help adapt the PC to Asian needs. Intel has a 70-person software lab in Shanghai developing multimedia and 3-D content in Chinese.

Grove's PC efforts have already had a big impact. Michael Slater remembers that the PC of 1991 was "very weak" when compared with Apple's Macintosh. "But those differences have narrowed—very much because of Intel's attention to the platform," he says. Even competitors applaud Intel's market development. Says Jerry Sanders, CEO of AMD: "Anything they do that creates demand for computing power is a good thing. The whole industry is pulled along by that spending."

There's just one major complication—Intel is no longer completely in sync with Microsoft. Says Grove: "We are driven to move the PC platform forward with a single mind. Microsoft has a bit of a split interest. New computers matter to them, but the installed base matters as well." Microsoft makes lots of money supplying software designed for the 250 million machines sold in the past. While it also depends on success with new buyers, it does not depend on them as much as Intel.

"We are driven to move the PC platform forward with a single mind," says Grove. **"Microsoft has a bit of a split interest.** New computers matter to them, but the installed base matters as well."

Still, Microsoft and Intel do generally cooperate in trying to stimulate demand for PCs. The tension shows up when it comes to the Internet, where Netscape, not Microsoft, dominates the market for browser software. Says Intel's Kinnie: "If a Microsoft person thinks they have a way to use their technology to get a proprietary position on the Internet, they'll do it. But our overall motivation is always to grow the market. We see our role as establishing an open framework so everyone can go innovate their brains out." So when it comes to Internet software, Intel works as closely with Netscape as it does with Microsoft.

PC manufacturers by and large applaud Intel's efforts at innovation. They worry, however, that immensely profitable Intel might claim even more of their comparatively meager take. Last June, for example, MCI started selling, under its own brand, an Internet server designed and built by Intel. If MCI had not offered the server to its business customers, they might have turned to Compaq or another server company.

Such tension will only increase as Intel pushes the PC industry ever harder. But Grove doesn't think the company has any alternative. "I always worry that we're taking on too much," he says. "But we have a very crass reason to be a driving force. We build large factories and we have to fill them. It can't scare you when you don't have a choice."

Intel has no mandatory retirement age, and at 60, Grove has no plans to step down anytime soon. But in the January 13 announcement, he relinquished the company presidency to Barrett, who is 57. Though Intel won't confirm the widely held perception that Barrett is in line to succeed Grove, the move was significant. As he revealed in a cover story in FORTUNE last May, Grove has prostate cancer. He is no longer getting treatment, and the disease seems to be in check. Nevertheless, Grove wrote, "I know I will be stuck with this fear for the rest of my life."

Given the question of the CEO's health, it's fair to ask who is this man Grove has anointed. An outdoorsman, Barrett fishes on his private ranch in Montana, and resides in Phoenix because it's closer to mountains he loves to hike. He travels to Santa Clara three days a week, and works from an Intel office near his home the other two days. His wife, Barbara, is a lawyer who finished second in the 1994 Republican gubernatorial primary.

At Intel, Barrett is known as a no-nonsense manager who turned the company's manufacturing operations into a key strategic asset. They were barely adequate until he took them over in the mid-1980s. Since 1990 he has been chief operating officer. His role won't change when he adds the presidency on May 21—he'll still be in charge of the company's day-to-day operations.

Last May, in that FORTUNE article, Grove wrote, "I have a rule in my business: to see what can happen in the next ten years, look at what has happened in the last ten years." In the past ten years, Grove has turned Intel into perhaps the most self-reliant company in the technology world. In so doing, he has put his stamp on the company and emerged from the long shadows cast by Moore and Noyce. If Barrett someday takes over as CEO, it is Grove's legacy that he will promulgate. Asked where Intel is headed, Barrett says, "We picture ourselves going down the road at 120 miles per hour. Somewhere there's going to be a brick wall to cross, but our view is it's better to run into the wall than to anticipate it and stop short." Sounds an awful lot like Andy Grove.

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PSCRIPT Page Separator

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Exhibit B-76

Steve Jobs's Secret Plan to Take Back Apple

FORTUNE

MARCH 3, 1997

America's MOST ADMIRED Companies

Masters of Innovation

1. Coca-Cola
2. Mirage Resorts
3. Merck
4. United Parcel Service
5. Microsoft
6. Johnson & Johnson
7. Intel
8. Pfizer
9. Procter & Gamble
10. Berkshire Hathaway

$4.50 U.S. /

09>

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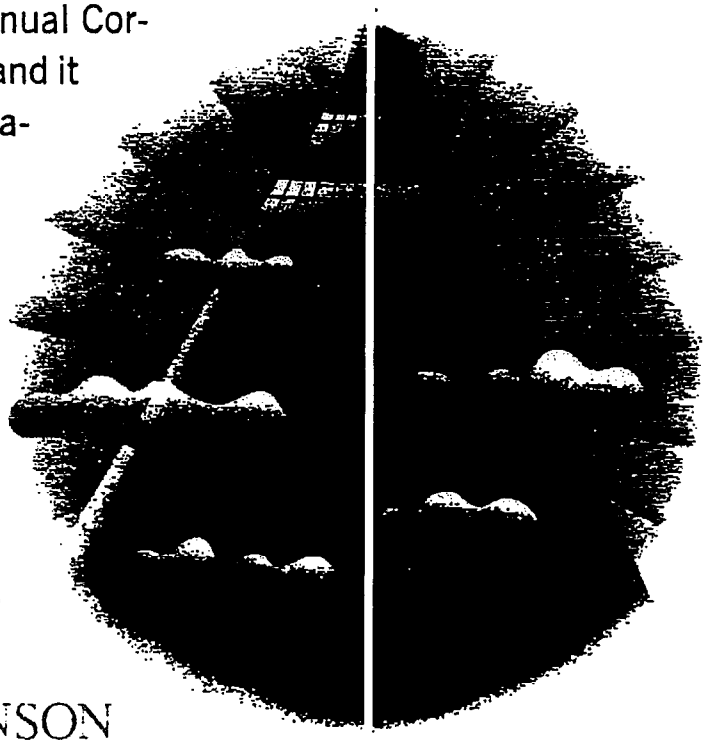
AMERICA'S MOST ADMIRED COMPANIES

The results of FORTUNE's 15th annual Corporate Reputations Survey are in, and it was a year of surprises. Yes, Coca-Cola once more clung to the summit, and TWA again occupied the cellar. But there was plenty of movement among America's most renowned companies in the middle. Rubbermaid slipped from the top ten after a decade-long run, and the once mighty AT&T posted the year's biggest slide.



BY EDWARD A. ROBINSON

THE MOST ADMIRED

RANK		COMPANY	SCORE
1	[illegible]	Coca-Cola Beverages	8.87
2	[illegible]	Mirage Resorts [illegible]	8.44
3	[illegible]	Merck [illegible]	8.34
4	[illegible]	United Parcel Service [illegible]	8.31
5	[illegible]	Microsoft [illegible]	8.29
6	[illegible]	Johnson & Johnson Pharmaceuticals	8.27
7	[illegible]	Intel Electronics	8.27
8	[illegible]	Pfizer Pharmaceuticals	8.23
9	[illegible]	Procter & Gamble Soaps, cosmetics	8.18
10	17	Berkshire Hathaway Diversified financial	8.18

THE LEAST ADMIRED

RANK		COMPANY	SCORE
431	[illegible]	TWA Airlines	3.42
430	408	Standard Commercial Tobacco	3.76
429	415	Kmart General merchandise	3.82
428	•	Canandaigua Wine Beverages	4.03
427	416	Morrison Knudsen Engineering, construction	4.05
426	401	Flagstar Food services	4.07
425	414	USAir Group Airlines	4.13
424	399	Beverly Enterprises Health care	4.31
423	411	Amerco Trucking	4.44
422	407	Cal Fed Bancorp Savings institutions	4.44

Early in '96, TWA [illegible] mend. Then came the crash of Flight [illegible] and a PR meltdown. It's TWA's second straight year as the least admired.

After a year defined by the slick image-making of presidential politics, it's refreshing to note that corporate reputations are built on firmer ground. Indeed, FORTUNE's 15th annual survey of corporate reputations shows once again that what elevates companies above their peers is a lot of honest hard work. In the preceding pages, we've described the major role of innovation in enhancing companies' standings. In addition, there emerge this year three other bedrock elements of success: the soundness of a company's financial structure, the caliber of its management, and its value to investors over the long term. Eight of the top ten companies in the survey excel in these key attributes of success (see box). And Coca-Cola, which repeats this year as America's most admired company, beat all comers in each.

This year's list, prepared by the research firm Clark Martire & Bartolomeo, brought some real surprises. Three new companies appeared in the top ten—United Parcel Service (No. 4), Pfizer (No. 8), and Berkshire Hathaway (No. 10). They joined perennial top performers like Merck (No. 3), Microsoft (No. 5), and Intel (No. 7). The basement featured four newcomers: Cal Fed Bancorp (No. 422); Beverly Enterprises (No. 424), a health care provider; Flagstar (No. 426), a food service firm; and Canandaigua Wine (No. 428). They accompany some repeat performers—Kmart (No. 429), Standard Commercial, a tobacco and wool concern, (No. 430), and Trans World Airlines (No. 431). TWA achieves the highly dubious distinction of being the least admired company for three straight years.

But what a year it was for repeat winner Coca-Cola. The Summer Olympics provided the Atlanta-based soft drink maker with a spectacular showcase for its ubiquitous global brand. Coke also scored points for its business prowess, articulated eloquently in its bold capture of a major PepsiCo bottler in South America. Chairman and CEO Roberto Goizueta says that a big part of what attracted the bottler to Coke was the enthusiasm, honesty, and quality of his work force. Says Goizueta: "Employees with integrity are the ones who build a company's reputation. Working for the Coca Cola company is a calling. It's not a way to make a living. It's a religion." And amen to Coca-Cola's results: It earned $3.5 billion last year, a 17% increase over 1995. It also provided a whopping 43.3% total return to investors in 1996, 23 points higher than the S&P 500 index, and its ten-year performance delivered a platinum 29.8% average annual return.

That kind of return buys a lot of admiration, but Intel's 1996 total return to investors of 131.2% deserves outright worship. Intriguingly, the Santa

ILLUSTRATIONS BY TERRY ALLEN

Please flip open to next page ······►

57 major advisory roles in telecommunications privatizations and restructurings.

78 integrated health care delivery networks created or expanded.

1,620 new technology ventures counseled in growth strategies annually.

28,105 risk management recommendations implemented for banking, securities, commodities, insurance and investment companies.

$400 million saved for manufacturers through supply chain improvements.

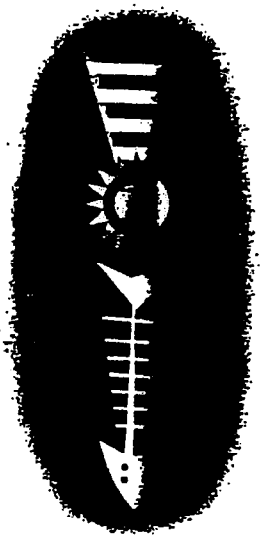
Continental Airlines Chairman and CEO Gordon Bethune has a lot to smile about. By vastly improving its service to customers, his company vaulted up nearly 100 places on the list

THE MOST ADMIRED

Coca-Cola
Mirage Resc
Merck
UPS
Microsoft
Johnson & J
Intel
Pfizer
Procter & G.
Berkshire H
3M
Hewlett-Pac
Corning

BIGGEST GAINERS AND LOSERS

THE 431 BE



BIGGEST GAINS OVER LAST YEAR

COMPANY	% CHANGE	SCORE
Continental Airlines	37.3%	5.86
PacifiCare Health Systems	27.0%	6.74
Oryx Energy	20.8%	6.31
Omnicom Group	15.0%	7.56
Salomon	22.4%	5.31
Herman Miller	13.9%	7.78
Freeport-McMoRan	14.5%	7.30
Morrison Knudsen	29.6%	4.05
Hilton Hotels	14.5%	6.94
Tyco International	13.5%	7.10

BIGGEST LOSSES OVER LAST YEAR

COMPANY	% CHANGE	SCORE
AT&T	–23.7%	5.61
Caliber System	–20.9%	5.21
Tenet Healthcare	–17.8%	5.81
Humana	–17.7%	5.09
Viacom	–15.1%	6.08
Arkansas Best	–18.3%	4.46
Apple Computer	–16.8%	4.87
Intl. Flavors & Fragrances	–12.2%	6.71
Warnaco Group	–14.1%	5.55
Consolidated Freightways	–14.1%	5.55

Clara, California, chipmaker drew higher praise for its innovation than for its financial performance—which says a lot about its engineers. Mirage Resorts, which got high marks for its ability to provide quality service, to attract good people, and to innovate, moved from No. 7 to No. 2. CEO Stephen Wynn's transformation of mundane hotels and casinos into sparkling gaming palaces has forever changed Las Vegas. For his efforts, Wynn's company was rewarded with the fourth-highest overall ranking in quality of management.

Another first-rate manager, Warren Buffett, drove Berkshire Hathaway, the holding company he runs, into the No. 10 spot. Berkshire's financial reputation scores remained even (read: excellent) with last year's. Likewise, Procter & Gamble, the Cincinnati-based household products maker, notched its highest score in the management column, apparently reflecting the exemplary job CEO John Pepper has done in cutting more than $3 billion in costs over the past five years.

As for those companies that took a hit to their reputations, let's start with Rubbermaid, the housewares giant that bestrode the No. 1 spot for two years before Coke's ascension in 1995. The Wooster, Ohio, company lost its decade-long residency in the top ten, falling to No. 22. Once heralded as a model of how to run a company, Rubbermaid this year saw its quality-of-management score drop by 12%. The company is still feeling the effects of a wrong turn it made a couple of years ago. Forced to raise prices after its cost of raw materials increased, it passed

HOW THIS WA

This year's survey of A companies comprises 4 panies, divided into 4 More than 13,000 senic and financial security ar largest companies (or in dustry by the eight key a year we added two new and temporary help. We arate categories: proper also eliminated ties in th to six decimal places an dex of companies appea

Scoring scale ···► 9

8.5

Mirage Resorts
Merck
UPS
Microsoft
Johnson & Johnson
Intel
Pfizer
Procter & Gamble
Berkshire Hathaway
3M
Hewlett-Packard
Corning

Home Depot
Levi Strauss Associates
Walt Disney
McDonald's
General Electric
Gillette
Boeing
Enron
Rubbermaid
Herman Miller
Cardinal Health
Goodyear Tire & Rubber
USAA
Motorola
American Intl. Group
J.P. Morgan
Shell Oil
Omnicom Group
M.A. Hanna
Interpublic Group

American Brands
Kimberly-Clark
Du Pont
Oracle
Merrill Lynch
Fed. Natl. Mortgage Assn.
Mobil
Norfolk Southern
Albertson's
Caterpillar
Exxon
Southwest Airlines
Coca-Cola Enterprises
Alcoa
Leggett & Platt
Anheuser-Busch
Deere
Emerson Electric
Xerox
Mangowar
General Re
Sun Microsystems
Citicorp
Walgreen
Fed. Home Loan Mtg. Assn.
Freeport-McMoRan
Williams
Chubb
Abbott Laboratories
Wal-Mart Stores
Marriott International
Morgan Stanley Group
Liz Claiborne
Southern
Freeport-McMoRan C&G
Sysco
Fluor
Eli Lilly
Northwestern Mut. Life
Campbell Soup
Lockheed Martin
Armstrong World Ind.
CUC International
Eastman Kodak
Federal Express
Chrysler
Compaq Computer
FPL Group
General Mills
Sara Lee
Dow Chemical
Columbia/HCA Healthcare
PanEnergy
Tyco International
HON Industries
Publix Super Markets
Nucor
State Farm Group
Amoco
United HealthCare
Olsten
Nordstrom
Dow Jones
Washington Mutual
ConAgra
Unifi
Sears Roebuck
Schering-Plough
IBM
Springs Industries
Monsanto
Estee Lauder

Nestle
Gannett
Tribune
Premark International
Shaw Industries
Golden West Financial
Household International
PepsiCo
Union Pacific
Safeway
AMR
Alco Standard
Hilton Hotels
AlliedSignal
Charles Schwab
Circus Circus Enterprises
American Home Products
Illinois Tool Works
United Technologies
Allstate
CPC International
McKesson
Clorox
CSX
Honeywell
Chevron
Brunswick
SBC Communications
Burlington No. Santa Fe
Ryder System
BankAmerica
VF
H.J. Heinz
Bristol-Myers Squibb
A. Schulman
Colgate-Palmolive
New York Life Insurance
Cyprus Amax Minerals
Russell
Genuine Parts
Textron
Philip Morris
Marsh & McLennan
Sonat
Cooper Tire & Rubber
Texas Instruments
NationsBank
PacifiCare Health Systems
Unilever
American Express
Banc One
Arrow Electronics
Vulcan Materials
Mitchell Energy & Devel.
Intl. Flavors & Fragrances
Travelers Group
Dell Computer
NGC
Host Marriott
XN Energy
Phelps Dodge
First Data
AGYO
American Honda Motor
Computer Associates Intl.
Turner Broadcasting
Dean Witter Discover
May Department Stores
Brinker International
Parker Hannifin
Kroger
Ingersoll-Rand
Automatic Data Proc.
Circuit City Stores
ITT Hartford Group
UAL
Office Depot
J.C. Penney
Bergen Brunswig
Knight-Ridder
Harrah's Entertainment
Toys "R" Us
Johnson Controls
BP America
Ford Motor
Texaco
Kimball International
Chase Manhattan
American Electric Power

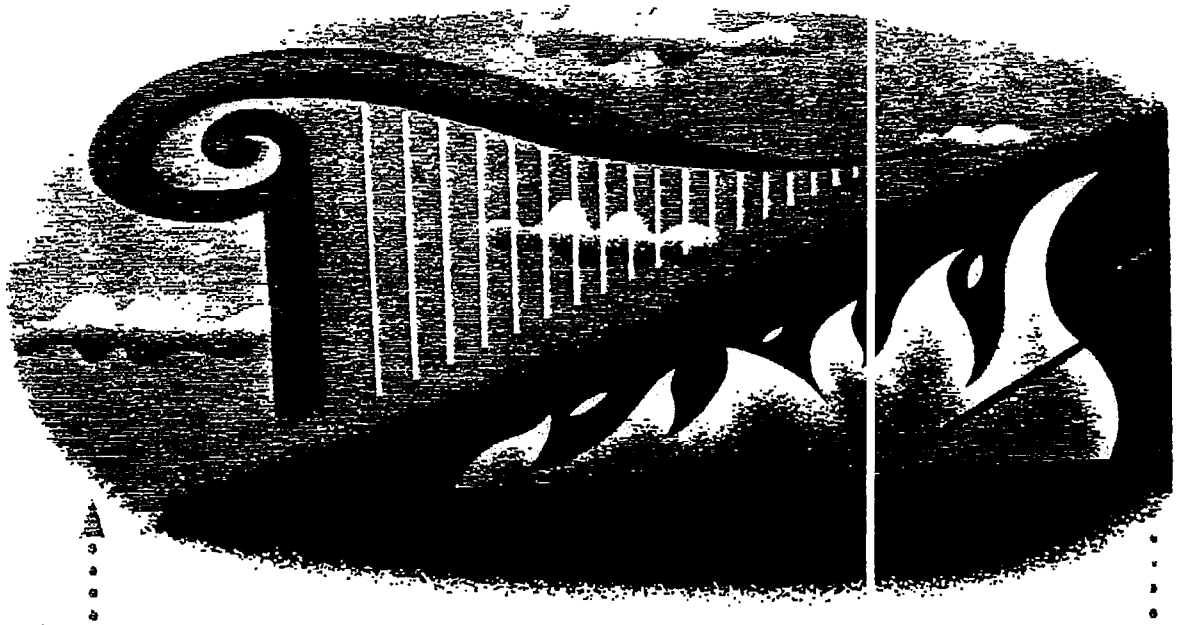
Weyerhaeuser
WestPoint Stevens
PPG Industries
Mead
Arco
New York Times
Rockwell International
International Paper
Thermo Electron
Halliburton
American Greetings
Lowe's
Principal Mutual Life Ins.
Dover
Seagate Technology
Union Camp
Black & Decker
TRW
First Union
Cummins Engine
Dana
Tejas Gas
AK Steel Holding
Northwest Airlines
Jacobs Engineering Group
Foster Wheeler
Pacific Gas & Electric
Student Loan Mktg. Assn.
Polaris Industries
Edison International
Daimler-Benz AG
Siemens
McDonnell Douglas
Centex
Reynolds Metals
Reader's Digest Assn.
Stanley Works
Texas Utilities
Pulte
Warner-Lambert
R.R. Donnelley & Sons
TIAA
Tenneco
BellSouth
Computer Sciences
Bayer
Dayton Hudson
U.S. Healthcare
Equitable
Orys Energy
Owens-Corning
Supervalu
ITT
Cone Mills
Sprint
Avon Products
Phillips Petroleum
Alumax
American Stores
Bear Stearns
A.G. Edwards & Sons
Roadway Express
Ameritech
Raytheon
General Dynamics
CREF
Bridgestone/Firestone
Kelly Services
McGraw-Hill
Becton Dickinson
Standard Fed. Bancorp.
Union Carbide
MCI Communications
Newell
First Chicago NBD
Entergy
Asarco
B.F. Goodrich
RJR Nabisco Holdings
Coleman Holdings
Adolph Coors
ITT Industries
Limited
Furniture Brands Intl.
Burlington Industries
Winn-Dixie Stores
Sundstrand
Mark IV Industries
Loews
US Freightways
Delta Air Lines
Bell Atlantic
Peter Kiewit Sons'
Landstar System
Viacom
Mohawk Industries
Liberty Mutual Ins. Group
American Standard
Hoechst Celanese
Pitney Bowes
BASF
Federated Dept. Stores
Raychem
Baxter International
Case

EST AND

WAS DONE

of America's most admired
ses 431 FORTUNE 1,000 com-
to 49 distinct industry groups.
senior executives, outside directors,
rity analysts were asked to rate the ten
(or in some cases fewer) in their own in-
key attributes of reputation (see box). This
new industry groupings: recreation equipment
). We divided insurance companies into two sep-
roperty and casualty, and life and health. We have
s in the rankings by carrying each company's score out
es and then rounding it off to two decimal places. An in-
ppears at the end of the listings.

8 7.5 7 6.5



WORST COMPANIES

Northrop Grumman
Bankers Trust N.Y.
CDI
Crown Cork & Seal
J.B. Hunt Transport Svcs.
Food Lion
Volt Information Sciences
Pharmacia & Upjohn
Canon U.S.A.
Dresser Industries
PriceCostco
Charter One Financial
Conrail
Metropolitan Life Ins.
Comdisco
Dillard Department Stores
Continental Airlines
IBP
Times Mirror
Air Express International
Equitable Resources
Collins & Aikman
American General
Aramark
Tenet Healthcare
Whirlpool
EG&G
Time Warner
Masco
General Motors
Fleetwood Enterprises
H F Ahmanson
Owens-Illinois
Dun & Bradstreet
Fleet Financial Group
U.S. Industries
Airborne Freight
Nationwide Ins. Enterprise
Helene Curtis Industries
Cigna
USG
Pittston
Bausch & Lomb
Polaroid
Public Svc. Entpr. Group
NorAm Energy
Georgia-Pacific
GTE
MascoTech
Alaska Air Group
AT&T
Great Western Financial
Consolidated Freightways
Warnaco Group
WellPoint Health Netwks.
Hovnanian Enterprises
Alberto-Culver
USX

Ball 5.49
Bally Entertainment 5.49
Enserch 5.49
UST 5.37
Ruby Tuesday 5.37
Fleming 5.37
Con Edison of N.Y. 5.34
Turner Corp. 5.31
Tandy 5.32
LTV 5.26
Unicom 5.25
Melville 5.23
Salomon 5.21
US West 5.21
Fred Meyer 5.21
Schuller 5.18
Aetna Life & Casualty 5.16
Champion International 5.13
Inland Steel Industries 5.10
Brown-Forman 5.07
Caliber System 5.07
Triarc 5.07
Health Systems Intl. 5.05
J.E. Seagram 5.02
W.R. Grace 5.02
Occidental Petroleum 5.02
Archer Daniels Midland 5.01
Digital Equipment 5.01
Foamex International 5.01
Paine Webber Group 5.01
Humana 5.00
Fieldcrest Cannon 5.00
Dial 5.00
Westinghouse Electric 5.00
Universal 5.00
Kellwood 5.00

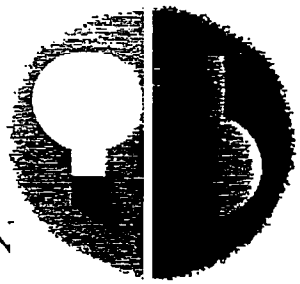
FHP International 4.99
Maxxam 4.96
Outboard Marine 4.96
Southland 4.93
James River of Va. 4.91
Nynex 4.88
Apple Computer 4.87
Prudential Ins. of Amer. 4.84
Unisys 4.83
Dimon 4.78
A&P 4.77
Boise Cascade 4.77
Lehman Brothers Holdings 4.74
Meriset 4.73
America West Airlines 4.72
Woolworth 4.72
Bethlehem Steel 4.67
Shoney's 4.67
Fruit of the Loom 4.63
Glendale Federal Bank 4.63
Yellow 4.59
Foodmaker 4.56
Southern Pacific Rail 4.56
Whitman 4.55

Stone Container 4.48
Family Restaurants 4.47
Arkansas Best 4.46
Cal Fed Bancorp 4.44
Amerco 4.42
Beverly Enterprises 4.39
USAir Group 4.37
Flagstar 4.37
Morrison Knudsen 4.36
Canandaigua Wine 4.36

THE LEAST ADMIR

Kmart
Standard Comm
PHA

6 5.5 5 4.5 4



EIGHT KEY ATTRIBUTES OF REPUTATION

[illegible] eight attributes [illegible]

[illegible] *pot.*

Bear Stearns analyst William Deatherage, and AT&T isn't used to competing with nimble adversaries.

Another high-profile tumble was suffered by entertainment giant Viacom, which nose-dived from No. 63 to No. 290. Though it basked in the glory of two blockbuster movies produced by its Paramount unit—*Mission: Impossible* and *Star Trek: First Contact*—it experienced turmoil in the executive suite when Chairman Sumner Redstone jettisoned CEO Frank Biondi.

Moving to the resurrection department, it's plain to see that some companies seized on the opportunities a purring economy offered. Case in point: Continental Airlines, which won bragging rights as this year's comeback kid, climbing from No. 412—sixth worst—to No. 317. CEO Gordon Bethune's hands-on management approach and the airline's much improved quality of service were reflected in our survey, with 34% and 32% jumps in each category, respectively. But it didn't hurt

INNOVATIVENESS

MOST ADMIRED	SCORE
Enron	9.01
Mirage Resorts	8.90
Intel	8.87
LEAST ADMIRED	**SCORE**
TWA	3.68
Kmart	3.79
Cal Fed Bancorp	3.81

ABILITY TO ATTRACT, DEVELOP AND KEEP TALENTED PEOPLE

MOST ADMIRED	SCORE
Microsoft	9.05
Coca-Cola	8.81
Mirage Resorts	8.52
LEAST ADMIRED	**SCORE**
TWA	2.62
Morrison Knudsen	3.65
Standard Commercial	3.69

QUALITY OF MANAGEMENT

MOST ADMIRED	SCORE
Coca-Cola	9.30
Berkshire Hathaway	9.16
Microsoft	8.93
LEAST ADMIRED	**SCORE**
TWA	3.75
Canandaigua Wine	3.87
Archer Daniels Midland	3.92

QUALITY OF PRODUCTS OR SERVICES

MOST ADMIRED	SCORE
Coca-Cola	9.23
Mirage Resorts	9.15
Walt Disney	8.83
LEAST ADMIRED	**SCORE**
Kmart	4.04
Southern Pacific Rail	4.15
TWA	4.27

VALUE AS A LONG-TERM INVESTMENT

MOST ADMIRED	SCORE
Coca-Cola	9.11
Berkshire Hathaway	8.81
Microsoft	8.73
LEAST ADMIRED	**SCORE**
TWA	2.67
USAir Group	3.21
Apple Computer	3.22

FINANCIAL SOUNDNESS

MOST ADMIRED	SCORE
Coca-Cola	9.44
Microsoft	9.42
United Parcel Service	9.19
LEAST ADMIRED	**SCORE**
TWA	2.23
Kmart	2.85
Standard Commercial	2.98

COMMUNITY AND ENVIRONMENTAL RESPONSIBILITY

MOST ADMIRED	SCORE
Coca-Cola	8.35
Herman Miller	8.23
Corning	8.03
LEAST ADMIRED	**SCORE**
Standard Commercial	3.60
Archer Daniels Midland	3.92
Amerco	3.94

USE OF CORPORATE ASSETS

MOST ADMIRED	SCORE
Berkshire Hathaway	8.84
Coca-Cola	8.74
McDonald's	8.25
LEAST ADMIRED	**SCORE**
Morrison Knudsen	2.98
Standard Commercial	3.56
Kmart	3.59

[illegible] HEY DID FOR SHAREHOLDERS

THE MOST ADMIRED

COMPANY	TOTAL RETURN TO INVESTORS 1986–96	1996
Coca-Cola	29.8%	43.3%
Mirage Resorts	27.9%	25.4%
Merck	22.1%	24.0%
United Parcel Service	N.A.	N.A.
Microsoft	44.5%	88.3%
Johnson & Johnson	22.2%	18.1%
Intel	43.8%	131.2%
Pfizer	21.7%	34.0%
Procter & Gamble	21.9%	32.1%
Berkshire Hathaway	28.3%	6.2%
S&P 500	11.8%	20.3%

N.A. Not available

THE LEAST ADMIRED

COMPANY	TOTAL RETURN TO INVESTORS 1986–96	1996
TWA	N.A.	–36.7%
Standard Commercial	6.6%	113.4%
Kmart	0.5%	45.6%
Canandaigua Wine	11.8%	–12.6%
Morrison Knudsen	N.A.	N.A.
Flagstar	N.A.	–71.0%
USAir Group	–4.2%	76.4%
Beverly Enterprises	–2.3%	20.0%
Amerco	N.A.	66.7%
Cal Fed Bancorp	–14.6%	55.6%
S&P 500	11.8%	20.3%

N.A. Not available

that the robust economy drove demand for air travel higher, prompting industrywide hikes in ticket prices. That helped the company post record year-end operating profits—$556 million. Not bad for a company that used to simply lose less money than usual during good economic years. Says Bethune: "We were ready to capitalize on a good rising tide, and we didn't have any holes in our boat."

The least admired companies turned in dismal performances in the financial soundness, management [illegible] and long-term investment categories. TWA, for instance, actually flew high during the first six months of the year, with the company's share price climbing from around $10 in January to a $23 high in April. Then came the Flight 800 crash in July and the airline's achingly slow response. TWA failed so poorly in communicating with families of the victims that one PR manager at another airline faxed TWA a how-to guide in crisis management. Later in the year the airline announced that, to curb losses in its transatlantic business, it would initiate a major rollback in its operation at New York City's Kennedy airport. Shares now hover around $6.

Meanwhile, Kmart ranked poorly again as its turnaround appeared to run out of gas. Analysts say the Troy, Michigan, retailer desperately needs revenue growth, but can't lower prices without risking erosion in its fragile earnings picture. Kmart CEO Floyd Hall might find solace in the fact that the company's quality-of-management score rose 25% this year. Then again, the retailer has one of the worst rankings in the use-of-corporate-assets category and was also slapped in the quality-of-service column. Analysts are apocalyptic about the company's future. "It's a lost cause," says Robert F. Buchanan of NatWest Securities.

Some companies like Microsoft ranked well because of their ability to attract and keep talented people. Microsoft takes this issue very seriously, and the software colossus, known for luring high-IQ workers to Redmond, Washington, leads the field in attracting hot talent to its ranks. In fact, two companies that posted big gains in reputation this year [illegible] Smith Barney [illegible] Maughan [illegible] That being [illegible] No. [illegible] to No. [illegible] in the [illegible]

But advertising giant Omnicom Group fared even better. It [illegible] from No. [illegible] to No. [illegible] experiencing a [illegible] increase in its [illegible] score. Nothing draws [illegible] to your ship like a clearly defined destination and a plan to get there, and last year Omnicom provided [illegible] It made an unambiguous move into cyberspace with its acquisitions of minority stakes in eight interactive advertising agencies. Wall Street liked what it saw, and the stock rose from $35 last year to a recent $48 per share. "At one time Omnicom was playing catch-up with its competitors," says Karen Fi[illegible]ker, an analyst with Furman Selz. "Today it's receiving credit for its strategy and for achieving some aggressive earnings expectations."

There are no magic tricks here, or at other companies that scored well this year. There's just solid performance—the surest way anyone has found to shine a corporate reputation.

USING CAPITAL WISELY

[illegible]

THE MOST ADMIRED

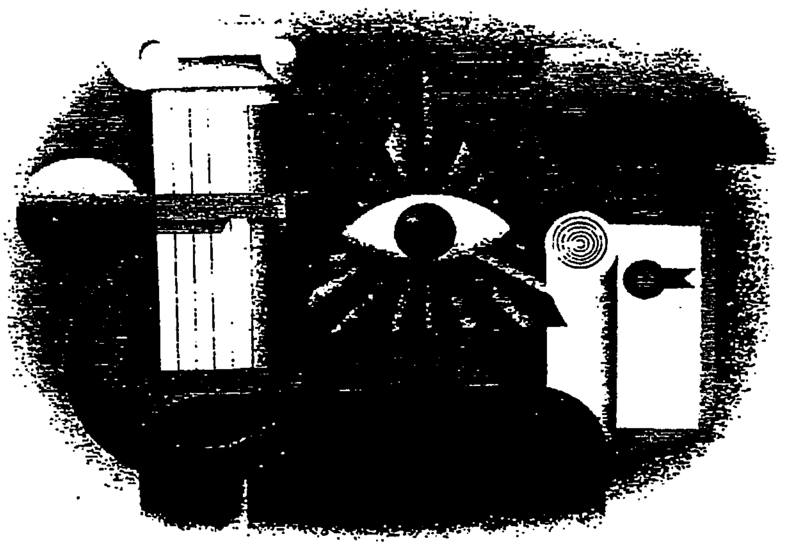
COMPANY	EVA 1995
Coca-Cola	$2,[illegible]40
Mirage Resorts	$3
Merck	$1,[illegible]15
United Parcel Service	$[illegible]35
Microsoft	$1,[illegible]45
Johnson & Johnson	$[illegible]41
Intel	$2,[illegible]31
Pfizer	$[illegible]62
Procter & Gamble	$[illegible]24
Berkshire Hathaway	[illegible].A.

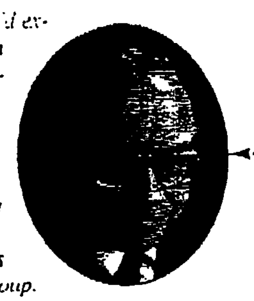
THE LEAST ADMIRED

COMPANY	EVA 1995
TWA	–$161
Standard Commercial	–$21
Kmart	–$1,294
Canandaigua Wine	$10
Morrison Knudsen	–$12
Flagstar	–$235
USAir Group	–$155
Beverly Enterprises	–$119
Amerco	–$60
Cal Fed Bancorp	–$93

COMPANIES RANK IN THEIR OWN INDUSTRIES

Who knows a company better than its competitors? Here's how peers rank one another in their own industry groups.





It's just what you'd expect from Warren Buffett and Berkshire Hathaway: high scores in management, investment value, and use of corporate assets. Berkshire repeats as No. 1 in its group.

THE MONEY GAME

A year of big deals and bull market euphoria has left bankers happy. Again J.P. Morgan leads the pack in banks, and Merrill Lynch is the lead bull among brokerage houses.

COMMERCIAL BANKS

1996	1995	COMPANY	SCORE
1	[illegible]	J.P. Morgan	7.57
2	[illegible]	Citicorp	7.31
3	5	BankAmerica	6.85
4	[illegible]	NationsBank	6.74
5	[illegible]	Banc One Corp.	6.73
6	3	Chase Manhattan[2]	6.52
7	7	First Union	6.42
8	•	First Chicago NBD	6.16
9	10	Bankers Trust New York	5.97
10	•	Fleet Financial Group	5.72

SAVINGS INSTITUTIONS

1996	1995	COMPANY	SCORE
1	[illegible]	Washington Mutual	7.06
2	[illegible]	Golden West Financial	6.96
3	5	Standard Federal Bancorp.	6.18
4	•	Charter One Financial	5.90
5	4	H.F. Ahmanson	5.75
6	[illegible]	Great Western Financial	5.57
7	[illegible]	Glendale Federal Bank	4.60
8	[illegible]	Cal Fed Bancorp[3]	4.44

BROKERAGE

1996	1995	COMPANY	SCORE
1	1	Merrill Lynch	7.46
2	3[1]	Morgan Stanley Group	7.23
3	2	Charles Schwab	6.93
4	3	Bear Stearns	6.25
5	•	A.G. Edwards & Sons	6.24
6	6	Salomon	5.31
7	5	Paine Webber Group	5.10
8	4	Lehman Brothers Holdings	4.74

INSURANCE: LIFE & HEALTH[4]

1996	1995	COMPANY	SCORE
1	•	Northwestern Mutual Life	7.18
2	3	New York Life	6.80
3	•	Principal Mutual Life	6.44
4	4	Teachers Ins. & Annuity Assn.	6.35
5	•	Equitable	6.32
6	7	Metropolitan Life	5.88
7	6	Nationwide Ins. Enterprise	5.69
8	8	Cigna	5.68
9	9	Aetna Life & Casualty	5.26
10	10	Prudential Ins. of America	4.84

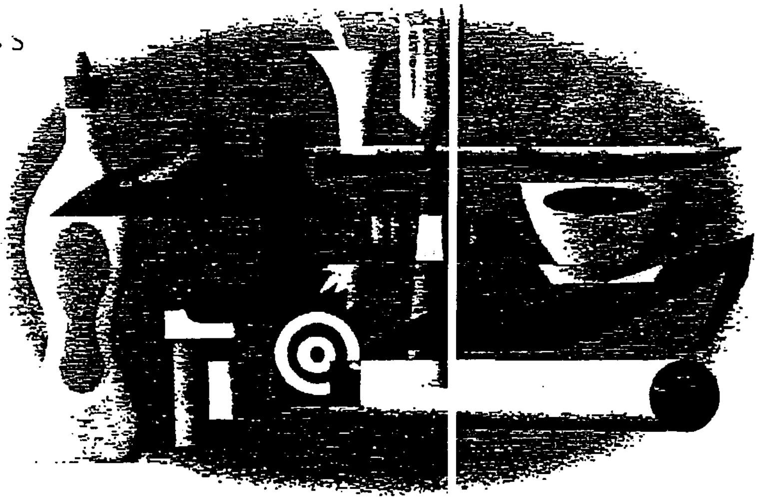
INSURANCE: PROPERTY & CASUALTY[4]

1996	1995	COMPANY	SCORE
1	•	United Svcs. Automobile Assn.	7.62
2	1	American International Group	7.58
3	•	General Re	7.32
4	•	Chubb	7.26
5	2	State Farm Group	7.08
6	•	Allstate	6.90
7	5	Travelers Group	6.70
8	•	ITT Hartford Group[5]	6.60
9	9[5]	Loews	6.10
10	•	Liberty Mutual Ins. Group	6.08

DIVERSIFIED FINANCIAL

1996	1995	COMPANY	SCORE
1	1	Berkshire Hathaway	8.18
2	2	Fed. Natl. Mortgage Assn.[5]	7.45
3	4	Fed. Home Loan Mtg. Assn.	7.30
4	5	Household International	6.95
5	•	Marsh & McLennan	6.76
6	6	American Express	6.74
7	7	Dean Witter Discover	6.66
8	•	Student Loan Marketing Assn.	6 40
9	•	College Retirement Equities Fnd.	6.20
10	3	American General	5.83

•Not ranked last year. Chemical Banking Corp. changed its name to Chase Manhattan after [illegible] 31, 1996. Acquired by First Nationwide Holdings January 3, 1997. Ran[illegible] last year [illegible] new categories replacing insurance. One of three companies resulting from the [illegible]



Wal-Mart may [illegible] the general-merchandise category, but the momentum belongs to Sears, which has [illegible] its brand name and reconnected with shoppers.

SPECIALIST RETAILERS

1996	1995	COMPANY	SCORE
1	1	Home Depot	7.99
2	3	Circuit City Stores	6.60
3	2	Office Depot	6.58
4	4	Toys "R" Us	6.54
5	5	Lowe's	6.44
6	7	Limited	6.13
7	8	PriceCostco	5.92
8	5	Tandy	5.42
9	9	Melville[1]	5.33
10	10	Woolworth	4.72

FOOD & DRUG STORES

1996	1995	COMPANY	SCORE
1	1	Albertson's	7.41
2	3	Walgreen	7.30
3	2	Publix Super Markets	7.10
4	4	Safeway	6.95
5	6	Kroger	6.60
6	7	American Stores	6.25
7	5	Winn-Dixie Stores	6.12
8	8	Food Lion	5.96
9	9	Southland	4.92
10	10	A&P	4.77

FOOD SERVICES

1996	1995	COMPANY	SCORE
1	1	McDonald's	7.95
2	2	PepsiCo	6.95
3	4	Brinker International	6.62
4	3	Wendy's International	6.49
5	5	Aramark	5.82
6	6	Ruby Tuesday[2]	5.47
7	7	Shoney's	4.67
8	10	Foodmaker	4.58
9	9	Family Restaurants	4.47
10	8	Flagstar	4.07

GENERAL MERCHANDISE

1996	1995	COMPANY	SCORE
1	1	Wal-Mart Stores	7.24
2	2	Nordstrom	7.06
3	6	Sears Roebuck	7.05
4	4	May Department Stores	6.63
5	3	J.C. Penney	6.56
6	5	Dayton Hudson	6.32
7	7	Federated Department Stores	6.05
8	9	Dillard Department Stores	5.86
9	•	Fred Meyer	5.31
10	10	Kmart	3.82

THE BRAND'S THE THING

P&G remains soap king. Philip Morris cut costs in its food business, grew tobacco sales, and jumped to second place behind American Brands.

SOAPS, COSMETICS

1996	1995	COMPANY	SCORE
1	1	Procter & Gamble	8.18
2	•	Estée Lauder	7.01
3	3	Clorox	6.89
4	4	Colgate-Palmolive	6.82
5	6[3]	Unilever U.S.	6.74
6	2	Intl. Flavors & Fragrances	6.71
7	5	Avon Products	6.28
8	9	Helene Curtis Industries	5.69
9	8	Alberto-Culver	5.53
10	6	Dial	5.04

HEALTH CARE

1996	1995	COMPANY	SCORE
1	2	Columbia/HCA Healthcare	7.11
2	1	United HealthCare	7.07
3	8	PacifiCare Health Systems	6.74
4	4	U.S. Healthcare	6.32
5	3	Tenet Healthcare	5.81
6	•	WellPoint Health Networks	5.54
7	•	Health Systems Intl.	5.18
8	5	Humana	5.09
9	7	FHP International	4.99
10	10	Beverly Enterprises	4.31

Kmart, a longtime denizen of the reputation cellar, finished worst in the quality-of-service category and has left analysts bearish on its turnaround prospects.

FOOD

1996	1995	COMPANY	SCORE
1	•	Campbell Soup	7.18
2	2	General Mills	7.14
3	1	Sara Lee	7.13
4	3	ConAgra	7.06
5	•	Nestlé	6.99
6	4	CPC International	6.89
7	4	H.J. Heinz	6.84
8	4[4]	RJR Nabisco Holdings	6.15
9	9	IBP	5.85
10	10	Archer Daniels Midland	5.11

H.J. Heinz won praise for its expansion into the pet food business and its rising share price, but it fell in its group partly due to a strong showing by Campbell Soup—No. [illegible] last year.

BEVERAGES

1996	1995	COMPANY	SCORE
1	1	Coca-Cola	8.87
2	3	Coca-Cola Enterprises	7.38
3	2	Anheuser-Busch	7.36
4	4	Adolph Coors	6.14
5	5	Brown-Forman	5.21
6	5	J.E. Seagram	5.15
7	7	Whitman	4.55
8	•	Canandaigua Wine	4.03

TOBACCO

1996	1995	COMPANY	SCORE
1	1	American Brands	7.49
2	7	Philip Morris	6.76
3	2	UST	5.47
4	3	Universal	5.02
5	5	Dimon	4.78
6	6	Standard Commercial	3.76

• Not ranked last year. [1] Name changed to CVS. [2] [illegible] Restaurants. [3] Rank last year [illegible]. [4] Rank last year [illegible].

[illegible] REPUTATIONS

[illegible]

ELECTRIC & GAS UTILITIES

1996	1995	COMPANY	SCORE
1	[illegible]	Southern	7.22
2	[illegible]	FPL Group	7.14
3	[illegible]	American Electric Power	6.50
4	[illegible]	Pacific Gas & Electric	6.40
5	5	Edison International[1]	6.40
6	[illegible]	Texas Utilities	6.37
7	[illegible]	Entergy	6.16
8	3	Public Svc. Enterprise Group	5.65
9	[illegible]	Consolidated Edison of N.Y.	5.44
10	10	Unicom	5.35

MINING, CRUDE OIL

1996	1995	COMPANY	SCORE
1	1	Freeport-McMoRan	7.30
2	•	Freeport-McMoRan Cpr. & Gld.	7.22
3	4	Cyprus Amax Minerals	6.80
4	5	Vulcan Materials	6.72
5	5	Mitchell Energy & Devel.	6.71
6	10	Oryx Energy	6.31
7	3	Asarco	6.15

PETROLEUM REFINING

1996	1995	COMPANY	SCORE
1	1	Shell Oil	7.57
2	3	Mobil	7.45
3	2	Exxon	7.40
4	4	Amoco	7.07
5	5	Chevron	6.87
6	•	BP America	6.53
7	5	Texaco	6.52
8	7	Arco	6.47
9	8	Phillips Petroleum	6.28
10	9	USX	5.51

PIPELINES

1996	1995	COMPANY	SCORE
1	[illegible]	Enron	7.89
2	[illegible]	Williams	7.27
3	[illegible]	PanEnergy[2]	7.10
4	[illegible]	Sonat	6.76
5	•	NGC	6.70
6	•	KN Energy	6.67
7	[illegible]	Tejas Gas	6.41
8	[illegible]	Equitable Resources	5.84
9	[illegible]	NorAm Energy	5.64
10	[illegible]	Enserch	5.49

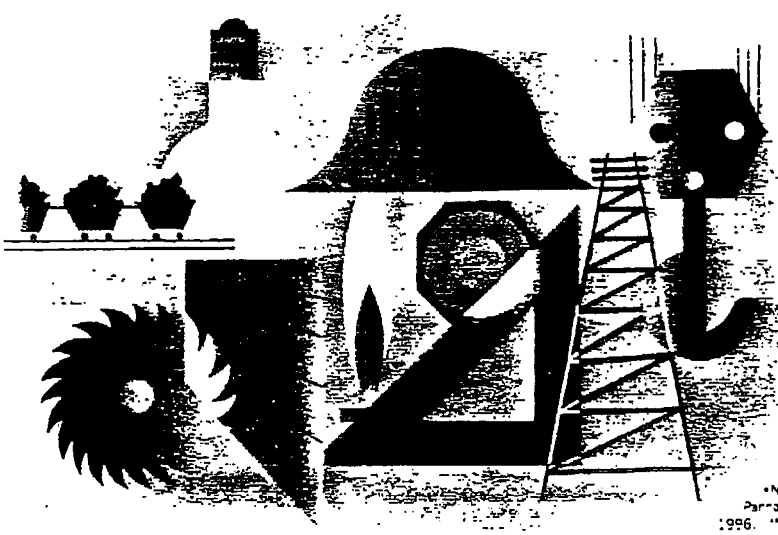
Shell Oil, the U.S. affiliate of the Royal Dutch/Shell Group, remained tops in its group by impressing rivals with its stellar financial performance.

BUILDING BLOCKS

Tyco International forged ahead to No. 2 in metal products, while Morrison Knudsen remains last in its crowd—even though it gained nearly 30% in its overall score.

ENGINEERING, CONSTRUCTION

1996	1995	COMPANY	SCORE
1	1	Fluor	7.20
2	5	Halliburton	6.45
3	•	Jacobs Engineering Group	6.41
4	3	Foster Wheeler	6.41
5	2	Centex	6.38
6	4	Pulte	6.37
7	6	Peter Kiewit Sons'	6.09
8	•	Fleetwood Enterprises	5.76
9	7	Turner Corp.	5.43
10	10	Morrison Knudsen[3]	4.05



METAL PRODUCTS

1996	1995	COMPANY	SCORE
1	[illegible]	llette	7.91
2	[illegible]	co International	7.10
3	[illegible]	inois Tool Works	6.92
4	5	anley Works	6.38
5	3	ewell	6.17
6	4	rown Cork & Seal	5.97
7	8	lasco	5.79
8	•	.S. Industries	5.70
9	10	lascoTech	5.63
10	9	all	5.49

BUILDING MATERIALS, GLASS

1996	1995	COMPANY	SCORE
1	1	orning	8.03
2	2	rmstrong World Industries	7.17
3	3	wens-Corning	6.31
4	4	wens-Illinois	5.75
5	5	JSG	5.68
6	•	chuller[4]	5.28

METALS

1996	1995	COMPANY	SCORE
1	1	Alcoa	7.38
2	2	Nucor	7.09
3	3	Phelps Dodge	6.67
4	•	AK Steel Holding	6.41
5	4	Reynolds Metals	6.38
6	5	Alumax	6.25
7	7	LTV	5.36
8	6	Inland Steel Industries	5.22
9	8	Maxxam	4.95
10	10	Bethlehem Steel	4.67

PILLS, PLASTIC AND PAPER

Merck and Johnson & Johnson swapped slots this year, and Pharmacia & Upjohn joined the top ten pharmaceuticals. Eli Lilly, maker of Prozac, remained steady.

PHARMACEUTICALS

1996	1995	COMPANY	SCORE
1	2	Merck	8.34
2	1	Johnson & Johnson	8.27
3	3	Pfizer	8.23
4	4	Abbott Laboratories	7.24
5	5	Eli Lilly	7.19
6	5	Schering-Plough	7.05
7	8	American Home Products	6.92
8	7	Bristol-Myers Squibb	6.83
9	10	Warner-Lambert	6.36
10	•	Pharmacia & Upjohn	5.94

•Not ranked last year. [1]Name changed from SCEcorp. [2]Name changed from Panhandle Eastern. [3]Acquired by Washington Construction Group [illegible] 1996. [4]Name changed from Manville.

TEXTILES

1996	1995	COMPANY	SCORE
1	[illegible]	Unifi	7.05
2	[illegible]	Springs Industries	7.03
3	[illegible]	Shaw Industries	6.96
4	[illegible]	WestPoint Stevens	6.48
5	•	Cone Mills	6.29
6	[illegible]	Burlington Industries	6.13
7	[illegible]	Mohawk Industries	6.08
8	[illegible]	Collins & Aikman	5.83
9	[illegible]	Triarc	5.20
10	[illegible]	Fieldcrest Cannon	5.06

RUBBER & PLASTIC PRODUCTS

1996	1995	COMPANY	SCORE
1	[illegible]	Rubbermaid	7.81
2	[illegible]	Goodyear Tire & Rubber	7.64
3	3	M.A. Hanna	7.52
4	4	Premark International	6.96
5	•	A. Schulman	6.83
6	5	Cooper Tire & Rubber	6.76
7	8	Bridgestone/Firestone	6.19
8	6	Mark IV Industries	6.10
9	9	Raychem	6.05
10	10	Foamex International	5.11

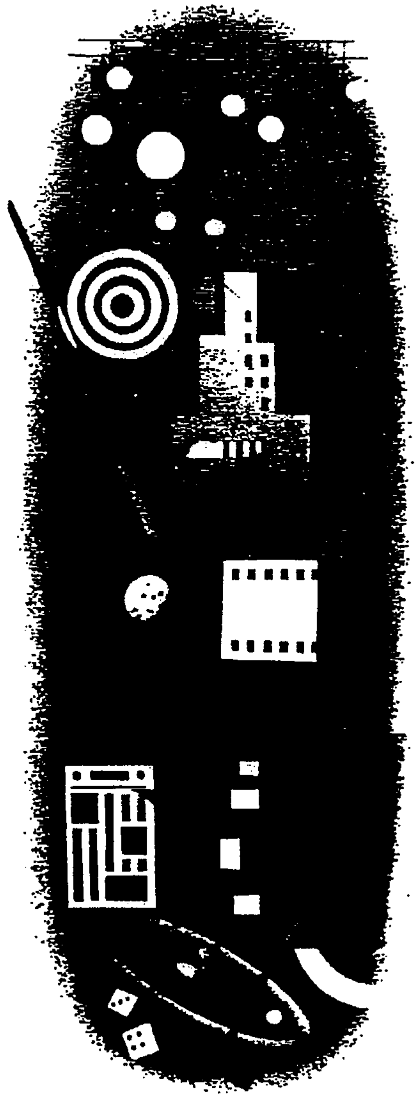
Rubbermaid bounced out of the overall top ten after a decade-long run, thanks to a lower management rating and a hassle with Wal-Mart that hurt earnings.

CHEMICALS

1996	1995	COMPANY	SCORE
1	1	Du Pont	7.48
2	2	Dow Chemical	7.12
3	3	Monsanto	7.03
4	4	PPG Industries	6.48
5	5	Bayer	6.32
6	5	Union Carbide	6.17
7	[illegible]	Hoechst Celanese	6.07
8	3	BASF	6.05
9	10	W.R. Grace	5.12
10	9	Occidental Petroleum	5.11

FOREST & PAPER PRODUCTS

1996	1995	COMPANY	SCORE
1	[illegible]	Kimberly-Clark	7.49
2	3	Weyerhaeuser	6.48
3	4	Mead	6.47
4	2	International Paper	6.45
5	•	Union Camp	6.42
6	5	Georgia-Pacific	5.64
7	5	Champion International	5.23
8	10	James River Corp. of Va.	4.91
9	8	Boise Cascade	4.77
10	9	Stone Container	4.49



HOW ABOUT THOSE FROGS!

With some savvy acquisitions and hit ads like those featuring the "Bud-weis-er" frogs, Omnicom leaped to the top of the crowd on Madison Avenue.

ADVERTISING, MARKETING

1996	1995	COMPANY	SCORE
1	3	Omnicom Group	7.56
2	2	Interpublic Group	7.50
3	1	CUC International	7.17
4	4	ADVO	6.67

PUBLISHING, PRINTING

1996	1995	COMPANY	SCORE
1	[illegible]	Dow Jones	[illegible]
2	[illegible]	Gannett	6.98
3	[illegible]	Tribune	6.97
4	[illegible]	Knight-Ridder	6.54
5	[illegible]	New York Times	6.45
6	3	American Greetings	6.45
7	[illegible]	Reader's Digest Association	6.38
8	[illegible]	R.R. Donnelley & Sons	6.36
9	9	McGraw-Hill	6.18
10	10	Times Mirror	5.85

ENTERTAINMENT

1996	1995	COMPANY	SCORE
1	1	Walt Disney	7.97
2	4	Turner Broadcasting System*	6.66
3	3	Viacom	6.08
4	5	Time Warner*	5.80

Mike Ovitz is long gone, but when you have villainess Cruella De Vil and her 101 Dalmatians, your reputation doesn't suffer. Disney is the top entertainer for the fourth straight year.

HOTELS, CASINOS, RESORTS

1996	1995	COMPANY	SCORE
1	1	Mirage Resorts	8.44
2	3	Marriott International	7.24
3	8	Hilton Hotels	6.94
4	5	Circus Circus Enterprises	6.92
5	4	Host Marriott	6.69
6	•	Harrah's Entertainment	6.54
7	•	ITT[1]	6.29
8	10	Bally Entertainment	5.49

RECREATIONAL EQUIPMENT

1996	1995	COMPANY	SCORE
1	•	Brunswick	6.87
2	•	Polaris Industries	6.40
3	•	Coleman Holdings	6.14
4	•	Outboard Marine	4.94

Illinois-based Brunswick is the kingpin of our debut Recreational Equipment group. The $3 billion company also makes fishing gear and marine products.

• Not ranked last year. Acquired Capital Cities/ABC February 9, 1996. [illegible] Turner Broadcasting System October [illegible] 1996. [1] One of three companies resulting from the breakup of [illegible]

[illegible]

[illegible] ...soft, HP, IBM, SBC, and Intel dominate.

COMPUTER & DATA SERVICES

1996	1995	COMPANY	SCORE
1	[illegible]	Microsoft	8.29
2	[illegible]	Oracle	7.46
3	[illegible]	First Data	6.67
4	[illegible]	Computer Associates Intl.	6.66
5	[illegible]	Automatic Data Processing	6.60
6	[illegible]	Computer Sciences	6.33
7	9	Comdisco	5.88
8	10	Dun & Bradstreet	5.74
9	[illegible]	Novell	5.54
10	[illegible]	Unisys	4.80

COMPUTERS, OFFICE EQUIPMENT

1996	1995	COMPANY	SCORE
1	1	Hewlett-Packard	8.06
2	3	Sun Microsystems	7.32
3	2	Compaq Computer	7.15
4	4	Intl. Business Machines	7.04
5	5	Dell Computer	6.70
6	6	Seagate Technology	6.43
7	7	Pitney Bowes	6.05
8	•	Canon U.S.A.	5.94
9	9	Digital Equipment	5.11
10	8	Apple Computer	4.87

SCIENTIFIC, PHOTO & CONTROL EQUIP.

1996	1995	COMPANY	SCORE
1	1	Minnesota Mining & Mfg.	8.14
2	2	Xerox	7.35
3	5	Eastman Kodak	7.16
4	3	Honeywell	6.88
5	4	Thermo Electron	6.45
6	6	Becton Dickinson	6.18
7	8	Baxter International	6.00
8	7	EG&G	5.81
9	10	Bausch & Lomb	5.67
10	9	Polaroid	5.66

TELECOMMUNICATIONS

1996	1995	COMPANY	SCORE
1	1	SBC Communications	6.86
2	3	BellSouth	6.35
3	6	Sprint	6.29
4	4	Ameritech	6.22
5	5	MCI Communications	6.17
6	[illegible]	Bell Atlantic	6.09
7	7	GTE	5.64
8	2	AT&T	5.61
9	[illegible]	US West	5.31
10	10	Nynex	4.88

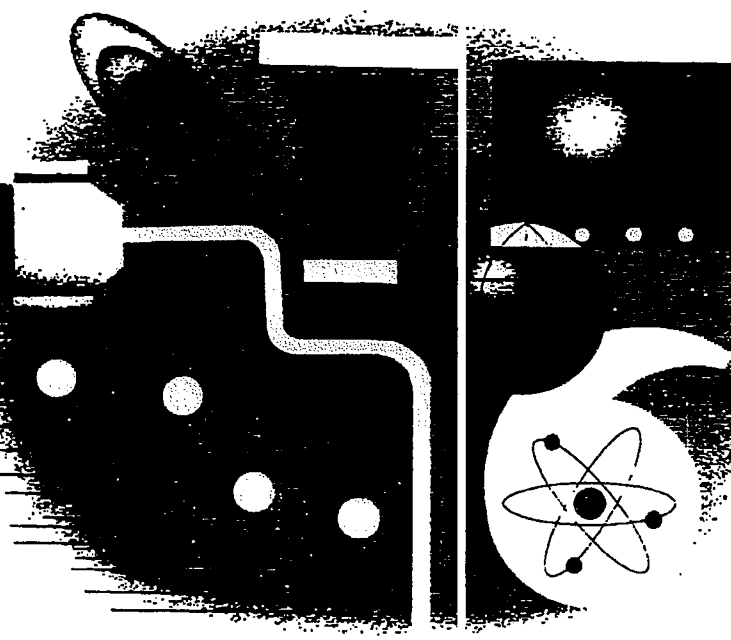
ELECTRONICS, ELECTRICAL EQUIPMENT

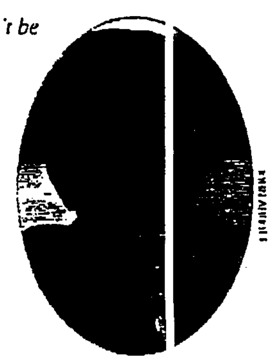
1996	1995	COMPANY	SCORE
1	[illegible]	Intel	8.27
2	[illegible]	General Electric	7.92
3	[illegible]	Motorola	7.61
4	[illegible]	Emerson Electric	7.35
5	[illegible]	Texas Instruments	6.75
6	[illegible]	Rockwell International	6.45
7	[illegible]	Siemens	6.39
8	[illegible]	Raytheon	6.21
9	[illegible]	Whirlpool	5.81
10	[illegible]	Westinghouse Electric	5.03

TEMPORARY HELP

1996	1995	COMPANY	SCORE
1	•	Manpower	7.34
2	•	Olsten	7.06
3	•	Kelly Services	6.18
4	•	CDI	5.97
5	•	Volt Information Sciences	5.95

Intel CEO [illegible] Grove [illegible] proud of [illegible] The company's reputation [illegible] among the [illegible] ry's best. Investors, on the other hand, are proud of [illegible] Intel delivered a stunning 131.2% total return in [illegible]





AT&T CEO Robert Allen can't be too pleased that his company posted this year's biggest drop in the reputation rankings. The telecom giant seemed uncertain as it faced nimble competitors in newly deregulated markets.

*Not ranked last year. †Rank last year in computers, office equipment.

INDEX
TO AMERICA'S MOST ADMIRED

Exhibit B-77

Snaring the masses, one computer giant eyes Net conquest

Technology: Microsoft leads the way in ad spending switch

By Bradley Johnson

MICROSOFT CORP. has seen advertising's future, and it's on the Internet.

Although Microsoft initially turned on to TV to build its brand with the masses, it now says it won't be long before its spending on Web ads matches or exceeds its TV budget.

"We are heading toward a new mass media," says Robert Herbold, 55, Microsoft's exec VP-chief operating officer, adding that it's "quite possible" the software giant's Internet media budget will surpass TV within the next decade.

MORE FOR INTERNET

Dennis Carter, Intel Corp.'s 45-year-old, VP-sales and marketing, says it's "quite likely" the computer industry within the next decade will spend more on Internet ads than on TV.

The technology category's two other power players—Abby Kohnstamm, 44, IBM Corp.'s VP-corporate marketing, and David Middleton, 41, VP-worldwide marketing and communications at Compaq Computer Corp.—stop short of giving Web a leg-up over TV in their future media budgets.

"Television is still much more of a mass medium than the Internet will [illegible]"

Actually, Intel is sure to displace Microsoft as the top spender next year when it starts allocating 10% of its estimated $750 million "Intel inside" co-op budget to online advertising.

That will assure a flood of Web advertising from PC makers who buy Intel chips and take its co-op cash. But Microsoft should remain the largest single Web advertiser.

Mr. Herbold, a veteran of Procter & Gamble Co., cautions that non-tech marketers must decide how the Web relates to consumers in their categories before blindly buying into Internet hype.

DISCIPLINE REQUIRED

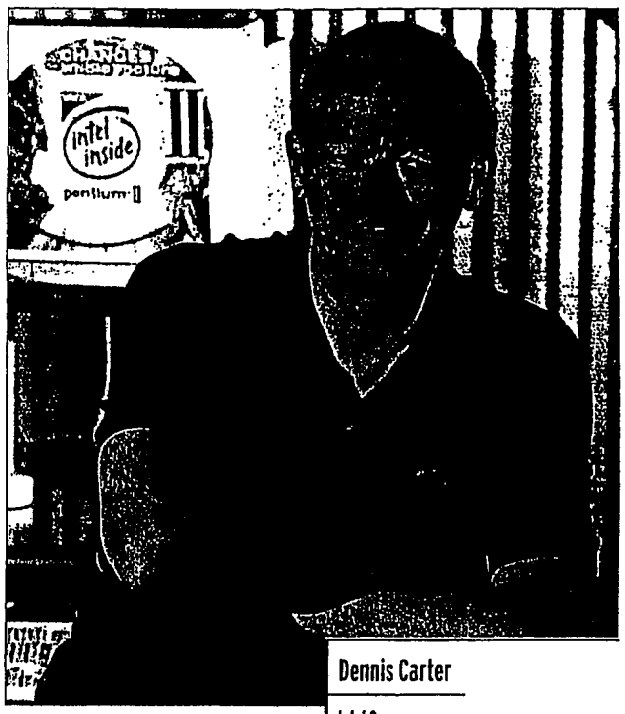
How should marketers—tech and non-tech—deal with a medium evolving as rapidly as the Internet?

The powers that be advise being disciplined about the medium while keeping in mind that current debates about banner ads, browsers and download speeds may prove insignificant in a few years given the pace of change.

Ms. Kohnstamm says the Internet has evolved enough that IBM is applying the same rigor and evaluation to Web site buys that it does to other media.

"As the options of where to advertise increase dramatically, Web site owners will have to compete for ad dollars the way all media always have," Ms. Kohnstamm says.

IBM now almost always demands to see a third-party au-



Dennis Carter

Intel Corp.
Title: VP-sales & marketing
Budget: $900 million worldwide
Agency: Euro RSCG Dahlin Smith White
Power play: Reengineered technology marketing and expanded the PC market through "Intel Inside."
Years on list: Three.

Abby Kohnstamm

IBM Corp.
Title: VP-corporate marketing
Budget: $700 million worldwide
Agency: Ogilvy & Mather Worldwide
Power play: Retooled perception of Big Blue from dog to top dog through smart advertising, smart media strategy and smart thinking.
Years on list: Three.

Robert Herbold

Microsoft Corp.
Title: Exec VP-chief operating officer
Budget: $300 million worldwide

ing, Microsoft's print and TV budgets are only getting an increase for inflation, well below the growth rate of its revenues.

Mr. Carter says Intel is purposefully leaving PC makers freedom to experiment with Web co-op money rather than setting up tight rules on how the "Intel inside" money can be applied.

"We don't have the formula for what's really going to work there," he says. "A laissez-faire (approach)...we think will lead to more experimentation."

NEW WAY TO MARKET

But Web advertising is only part of the current picture. Power

Air advance

AIRLINES *from Page S-4*
and heavenly experiences."

"If you talk to [our agency] Fallon McElligott," he says, "They've never met such a savvy, well-informed group of consumers" as United's focus groups. "They [the flying public] won't be fooled."

FINDING ROAD WARRIORS

The unique approach followed a comprehensive study of "road warriors" that Mr. Coltman ordered up after the airline surprised the industry by ditching its agency of 31 years, Leo Burnett Co., Chicago, in summer 1996.

The decision for an agency review came about "when we put the new team together after the employee buyout [of the airline]."

"If it's purely transportation, it doesn't matter whose 100,000 pounds of metal you're in."

says Mr. Coltman, 55. "We thought we were changing course and wanted to make sure our agency was going in the same direction."

With United's new campaign, its worldwide ad budget swelled from $100 million to $120 million, though that increase is mostly international. Y&R Advertising, New York, got the international side of the business.

Yet, Mr. Coltman said, such increases are an exception in the industry, which saw ad spending in-

...ternet budget will surpass TV within the next decade.

MORE FOR INTERNET

Dennis Carter, Intel Corp.'s 45-year-old, VP-sales and marketing, says it's "quite likely" the computer industry within the next decade will spend more on Internet ads than on TV.

The technology category's two other power players—Abby Kohnstamm, 44, IBM Corp.'s VP-corporate marketing, and David Middleton, 41, VP-worldwide marketing and communications at Compaq Computer Corp.—stop short of giving Web a leg-up over TV in their future media budgets.

"Television is still much more of a mass medium than the Internet will ever be," says Ms. Kohnstamm.

But all four agree the Internet is ideally suited today as a medium to target business buyers, who are almost all plugged into the Web. And they agree the Web is rapidly evolving as an efficient way to reach the mass of home PC users.

FOLLOWED THE LEADERS

Tech marketers followed older consumer companies to TV and now are leading the way to the Web. Microsoft expects to spend some $36 million to $41 million on Web ads in the year ending June 30, 1998, vs. an estimated $107 million on TV. Mr. Herbold estimates Microsoft, the top Web advertiser, accounts for 7% of all Web advertising.

"Our best customers are Internet friendly," he explains. "It makes sense to be the No. 1 spender."

Abby Kohnstamm

IBM Corp.
Title: VP-corporate marketing
Budget: $700 million worldwide
Agency: Ogilvy & Mather Worldwide
Power play: Retooled perception of Big Blue from dog to top dog through smart advertising, smart media strategy and smart thinking.
Years on list: Three.

Robert Herbold

Microsoft Corp.
Title: Exec VP-chief operating officer
Budget: $300 million worldwide
Agencies: Wieden & Kennedy; Anderson & Lembke
Power play: One-time Procter & Gamble exec bringing discipline and measurable performance to company's advertising. Delivering on vow to make Microsoft leader in Internet advertising.
Years on list: Three.

David Middleton

Compaq Computer Corp.
Title: VP-worldwide marketing & communications
Budget: $200 million worldwide
Agency: Ammirati Puris Lintas
Power play: Ex-IBMer came aboard in March. First year plan: Hired global agency. Hired global ad chief. Delivering global brand campaign. And doing so without pause, because Dell, IBM and Hewlett-Packard want to knock the No. 1 PC maker off its perch.
Years on list: One.

...evolving as rapidly as the ...ernet?

The powers that be advise being disciplined about the medium while keeping in mind that current debates about banner ads, browsers and download speeds may prove insignificant in a few years given the pace of change.

Ms. Kohnstamm says the Internet has evolved enough that IBM is applying the same rigor and evaluation to Web site buys that it does to other media.

"As the options of where to advertise increase dramatically, Web site owners will have to compete for ad dollars the way all media always have," Ms. Kohnstamm says.

IBM now almost always demands to see a third-party audit of a site before advertising, she adds.

INTERACTIVE ASSETS

Ms. Kohnstamm also says the Internet's key opportunity as a medium is in one-to-one interactive marketing tied to powerful customer databases.

"It's a very powerful medium that will increasingly play a major role in IBM's marketing activities," she says.

But Web money isn't necessarily incremental: Ms. Kohnstamm anticipates that much of the spending for IBM's Internet media will come out of traditional direct-marketing efforts like direct mail.

At Microsoft, Mr. Herbold hopes to cut the percentage of revenues spent on marketing this fiscal year for the third straight year; Microsoft spent 9.8% of revenues on marketing in the year ended June 30. So while Web spending is booming, Microsoft's print and TV budgets are only getting an increase for inflation, well below the growth rate of its revenues.

...ation.
Years on list: Three.

Mr. Carter says Intel is purposefully leaving PC makers freedom to experiment with Web co-op money rather than setting up tight rules on how the "Intel inside" money can be applied.

"We don't have the formula for what's really going to work there," he says. "A laissez-faire (approach)...we think will lead to more experimentation."

NEW WAY TO MARKET

But Web advertising is only part of the current picture. Power to newcomer Mr. Middleton, who left IBM in March to run Compaq's global marketing and communications, points to the Internet's bigger potential for marketing as opposed to just advertising.

"It will change how companies are structured to communicate with customers. As soon as you combine voice and data and video, [all] traversing the Internet, that's it: You've reached that new plateau," he says.

That suggests the Internet could become the multimedium, combining the power of print advertising, direct marketing and TV commercials. Yet Mr. Middleton is prudently cautious about where the Web fits in today.

"The Internet is going to go through a series of evolutionary steps," Mr. Middleton says. "You could envision that it would become a substantial, if not the most substantial, medium to reach customers. But it has some maturing to do."□

100,000 pounds of metal you're in!"

says Mr. Coltman, 55. "We thought we were changing course and wanted to make sure our agency was going in the same direction."

With United's new campaign, its worldwide ad budget swelled from $100 million to $120 million, though that increase is mostly international. Y&R Advertising, New York, got the international side of the business.

Yet, Mr. Coltman said, such increases are an exception in the industry, which saw ad spending increase 11% overall in 1996 by major carriers but actual outlays are short of what they were several years ago.

"I don't think you'll see huge increases," Mr. Coltman says. "There are so many other ways of communicating to passengers, such as websites."

SOUTHWEST MOVE

Southwest is one of few carriers to substantially increased its media budget, up 21.3% in 1996 to $90.7 million. Mr. Ridley says the ad increase is merely a reflection of the airline's success.

"We're the only airline that's been growing at the rate of 15% [in revenue] a year," he notes.

The bulk of new spending at Southwest still will likely go to fare ads.

"We'd all like to be McDonald's or Coca-Cola but we're perceived as a commodity industry," says Mr. Ridley. "If it's purely transportation, it doesn't matter whose 100,000 pounds of metal you're in."□

Exhibit B-78

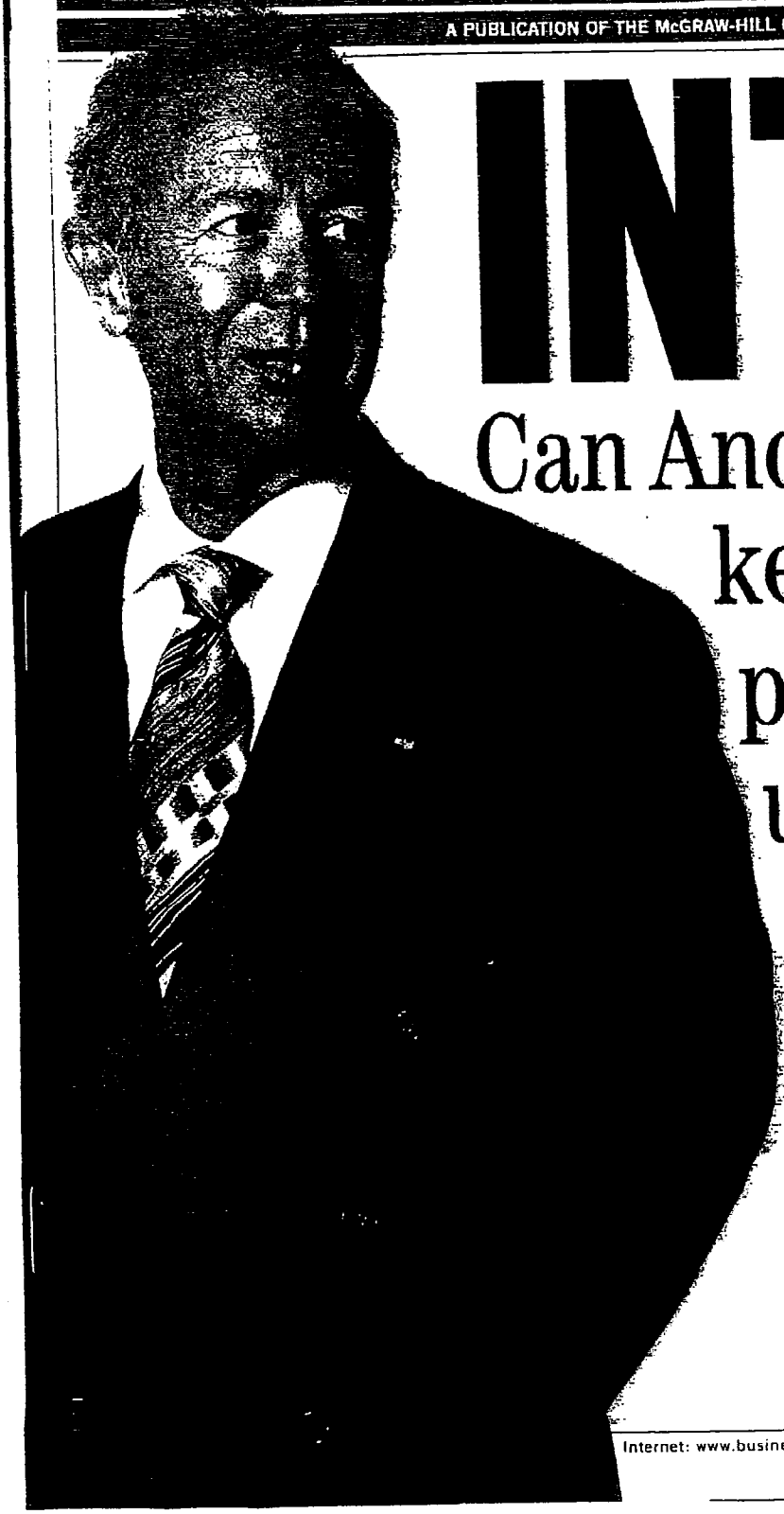
INVESTING SITES WALL STREET MONEY MACHINE EDUCATION COLLEGES

BusinessWeek

SPECIAL REPORT ON SMALL BUSINESS
ENTERPRISE
BEGINS OPPOSITE PAGE 60

A PUBLICATION OF THE McGRAW-HILL COMPANIES

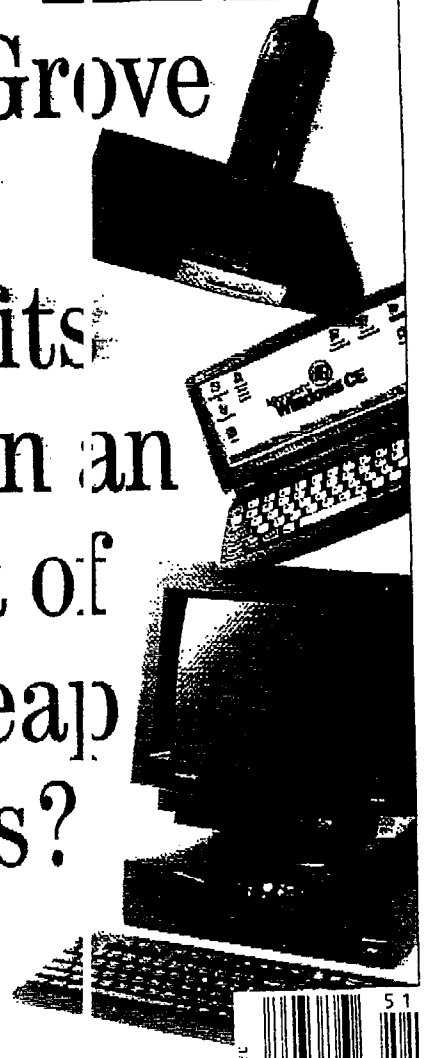
DECEMBER 22, 1997 / $3.50



INTEL

Can Andy Grove keep profits up in an era of cheap PCs?

PAGE 70



Internet: www.businessweek.com America Online: Keyword: BW

INTEL

Can Andy Grove keep profits up in an era of cheap PCs?

Cover Story

It wasn't too long ago that Intel Corp. executives were so dismissive of personal computers priced below $1,000 that they called them Segment Zero—a dumping ground for inventory close-outs and bottom-feeding PC cloners selling yesterday's technology. Instead, Intel held to the high ground, pushing pricey chips that could run the newest, coolest software. Not coincidentally, those chips helped produce the juiciest gross profit margins, some 60% overall, one of the highest in high tech.

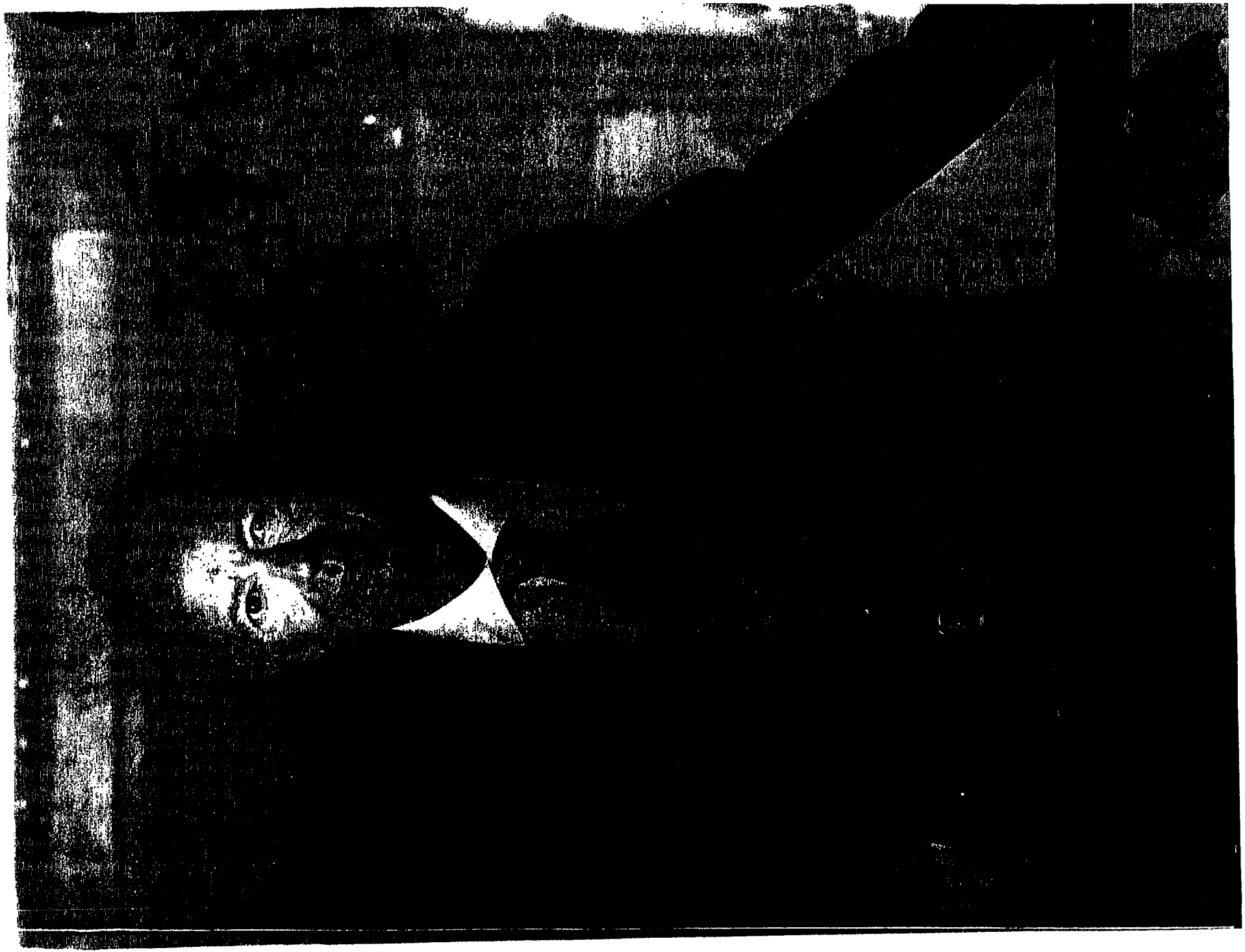
And why not? That bedrock strategy had turned Intel into a precision profit machine, growing almost as fast as the number of transistors on its slivers of silicon. With a 90% market share in PC processors, Intel's sales have headed skyward, growing 30% to 50% annually for the past four years. That made it the eighth-most-profitable company in the world in 1996, with earnings of $5.2 billion, not far behind Exxon Corp. and General Electric Co. GE sales, however, dwarfed Intel's $20.8 billion.

ABOUT-FACE. But that was last year—when the average PC was still a pricey $2,000. In February, Compaq Computer Corp. changed everything when it became the first top-tier PC maker to hawk powerful, dirt-cheap computers. Using the Pentium-compatible MediaGX chip from Intel rival Cyrix Corp., Compaq shipped a $999 Presario (that now sells for $799)—and the sub-$1,000 market exploded. Today, almost all big PC makers are pushing inexpensive gear, and sales in the segment have surged from just 7% of U.S. retail units in 1996 to an estimated 25% this year.

Suddenly, Segment Zero looks like priority No. 1 for Intel. For the first time in its history, the world's largest chip company is launching an all-out crusade to create processors specifically for the low-cost PC market, which it now calls by the more politically correct term "basic PCs." More surprising, in the past two weeks the company has staked out even cheaper ground—chips for everything from $500 network computers to $300 digital-TV set-top boxes. And behind Intel's deep-blue glass walls, engineers are designing processors for so-called backseat PCs—computers for playing games and cruising the Internet that could be built into cars by 2000.

If the Silicon Valley giant's grand plan to move beyond PCs hits the mark, the company's signature slogan could become Intel Inside *Everything*. Says Intel CEO Andrew S. Grove: "For us to walk away from a market whose size is going to be measured in tens of millions of units per year, maybe bigger, is inconceivable."

But what will selling cheaper chips do to Intel's amazing profit machine? Clearly, the strategy is a marked change in the company's longstanding practice of un-



Intel Inside *Everything*

The chip giant is pushing beyond the PC to make chips specifically for a broad range of digital devices

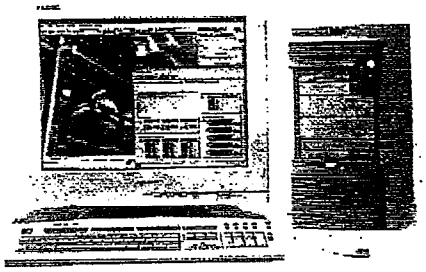
POWERFUL NETWORK SERVERS

INTEL-EQUIPPED DELL SERVER

Sales are growing at 22% this year, and 76% of servers now use Intel chips. But Pentium-powered servers cost only one-third as much, on average, as RISC-based models. Intel and PC makers want to move into even more profitable markets. One hope: servers that gang together as many as eight processors, using technology that Intel acquired.

TECHNICAL WORKSTATIONS

Intel has set its sights on the market dominated by Sun, Silicon Graphics, IBM, and Hewlett-Packard. With high-priced Intel-powered systems from Compaq, HP, and Dell, Intel has a 50% share of this business today. By 2000, that is projected to climb to 86%, says researcher IDC.



HP AND OTHER WORK-STATIONS MOVE TO INTEL

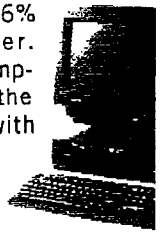
NETWORK COMPUTERS

IBM'S NETWORK MACHINE

These devices, which use a server to do the heavy lifting, were once the subject of Intel's scorn. Now, Intel is casting its lot behind the full range of so-called thin clients including NCs, NetPCs, and Windows terminals—a market expected to hit 6.8 million units by 2000.

SUB-$1,000 PCs

A segment of the market Intel can no longer avoid. Inexpensive PCs sold through retail stores have grown from 7% in 1996 to 36% in October. Intel is jumping into the market, with low-priced powerful chips, not the old Pentium.



COMPAQ'S LOW-PRICE PRESARI

HOME ENTERTAINMENT

Intel's a nonstarter there today but wants in. The next great wave of consumer electronics: digital TVs, satellite receivers, and videodisk players. The company plans to use a repackaged Pentium chip or even a DEC StrongARM chip to gain a toehold.

RCA'S SET-TOP UNIT

MOBILE DEVICES

Computing on the go is growing fast. Intel rules notebook PCs, but it's nowhere in handhelds, Internet phones, or smart cars. Intel aims to change that by taking on rivals like Advanced RISC Machines, MIPS, and Hitachi.

PROTOTYPE OF A SMART AUTOMOBIL

selling new processors at sky-high prices and then dropping them over a period of months or years. If low-cost gizmos become a big chunk of Intel's business, the company that set the standard for spinning silicon into gold could find itself grappling with lower gross margins—and massive changes in its vaunted business model.

That could be tricky. Intel spends big bucks to stay ahead of its rivals—some $4.5 billion this year on new chipmaking plants. Capital expenditures are forecast to climb even higher in 1998, to $5.3 billion, three times that of any other chipmaker in the world. That will help catapult Intel from No. 7 in worldwide production capacity today to No. 2 by 2002, analysts figure. But for Intel's bet to pay off in an era of lower-cost chips, the company must spit out even higher volumes. "It's a risk to go out and spend billions of dollars on these manufacturing plants," concedes Intel President Craig R. Barrett. "But if we didn't, we couldn't possibly reap the benefits. We're going down the road at 150 miles per hour, and we know there's a brick wall someplace, but the worst thing we can do is stop too soon and let somebody else pass us."

FULL SPEED AHEAD

"We know there's a brick wall someplace, but the worst thing we can do is stop...and let somebody else pass us," says President Barrett

Grove has no intention of leaving the fast lane. His strategy is to keep Intel ahead of the pack while keeping profits high. The plan: adopting a tactic like that of scrappy PC makers such as Compaq and Hewlett-Packard Co., which have kept their gross margins well above ground while selling bargain-basement PCs. The trick is to compensate for thin profits on the low end with higher volumes—and with pricier models aimed at the lucrative technical workstation and server markets.

MARKET JITTERS. Grove has a high-powered arsenal ready to go. He plans to counterbalance cheap chips with soaring sales of powerful Pentium IIs, such as a 400-megahertz version scheduled for release by mid-1998, a 450-Mhz model later in the year, and the highly promoted 64-bit Merced chip expected in late 1999, all of which will be used in workstations and servers and could boast 90% margins. "It's very important for us to participate at both ends of the wire," says Grove. "I think the formula is going to work out."

Still, Wall Street is jittery. Only last April, analysts predicted Intel would post sales this year of $27.5 billion and earn $8.1 billion, up 56% from 1996, putting it on a path to become the world's No. 3 profit maker. But since then, stock watchers have pared back projections: They now anticipate revenues of $24.9 billion. The revised earnings estimate, $6.8 billion, is still up a strong 31% from last year but short of the 44% and 54% growth spurts of the past two years.

Moreover, analysts figure that Intel's 1998 earnings will expand even more slowly—by 11%, to $7.6 billion, according to consensus estimates from First Call Corp. "The stock won't do well with that kind of earnings growth," says analyst Charles F. Boucher of UBS Securities Inc., who pegs Intel's 1998 profit growth even lower, at just 7.6%. Intel shares have already been hammered from an all-time high of $102 in early August to $77 today.

Does Grove agree that competing at the low end could douse Intel's earnings growth? "I don't know," he says with atypical uncertainty. But his usual go-for-the-jugular style quickly returns. "We are going to be motivated by participating in each of these segments to the fullest extent of our technical and marketing capabilities," he says.

Intel may have little choice. Analysts figure sales of sub-$1,000 PCs will climb 33% next year vs. growth of 20% for the PC market as a whole.

Cover Story

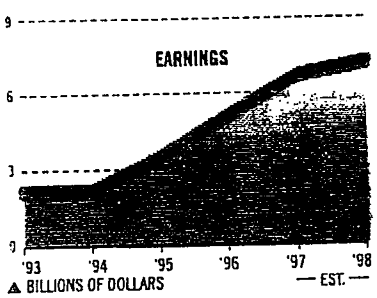
Even more telling, computers selling for $1,500 or less could mushroom from 39% of the U.S. consumer market this year to nearly half of the market by 2001, according to market researcher International Data Corp. (IDC).

At the same time, longtime rival Advanced Micro Devices Inc. (AMD) and upstart Cyrix Corp. have marked this territory as their own, rolling out processors priced well below Intel's chips and grabbing market share—together some 20% of the low end vs. 10% in 1996, according to IDC. "It's the first time in many years that there has been a viable alternative [to Intel] at the low end," says IBM Senior Vice-President Samuel J. Palmisano, who has chosen AMD's K6 chip for IBM's new line of sub-$1,000 machines.

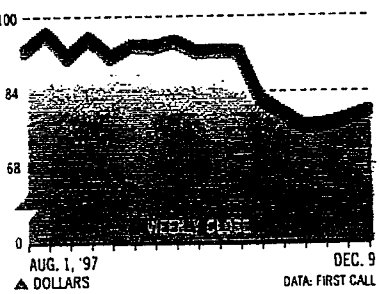
Grove is determined to cede no further ground. The hyper-aggressive CEO is legendary for his bet-the-company turnabouts. In 1985, when the market turned sour, Intel walked away from the business that launched the company two decades earlier: memory chips. And in 1994, Intel reversed itself to replace thousands of Pentium chips containing a minor flaw, a move that cost it $475 million. Grove has turned this tactic into a management philosophy that he calls "Only the paranoid survive."

Once again, Grove is showing his stripes. On Nov. 24, Intel was reorganized into five marketing and product

PREDICTIONS OF SLOWER EARNINGS GROWTH...



...HAVE PUNISHED INTEL'S STOCK PRICE



PHOTOGRAPH BY KAMIL TAHAKA; CHARTS BY RAY VELLA/BW

groups, including a consumer unit to address the no-frills market. The company's next big step is expected in February. That's when analysts predict the chip giant will cover its flank from Cyrix and AMD by slashing prices by as much as 40% on its oldest Pentium MMX chips, to as low as $70, a price not seen since the waning days of the 486 chip.

But that's just the warm-up. Intel's real assault on the low end will center, oddly enough, around the company's thoroughbred, the Pentium II. Instead of pushing older technology, Intel will throw nearly all of its weight behind the Pentium II, even if that means eating a bit of crow and slashing prices faster than planned. In the first half of the year, Intel plans to ship a stripped-down Pentium II that forgoes the "cache" memory packaged alongside the chip, which speeds performance by keeping frequently used data close to the processor. Removing the cache will slow down the Pentium II but will shave about $15 off Intel's $103 manufacturing cost, estimates consultant Micro Design Resources Inc.

Cover Story

Intel could sell this chip initially for around $200, half its current price and low enough to be used in PCs costing less than $1,500—but not in rock-bottom models. A $200 price would take a toll on profits anyway. Instead of the estimated 74% margin that Intel earns on its cheapest Pentium II today, a stripped-down model could gross less than 60%. Later in the year, Intel will ship a redesigned Pentium II that restores up to half of the missing cache by building it directly into the processor. This design could largely restore the Pentium II's performance without adding cost.

Will less powerful versions damage the gold-plated Pentium brand? Not at all, say Intel execs. "It's like Coke," explains Paul S. Otellini, Intel's senior vice-president for sales and marketing. "One brand, many different products."

But why use the Pentium II at all? Why not crank up the Pentium MMX, barely a year old and scheduled to be put out to pasture by the end of 1998? Intel favors the Pentium II because it gives the chipmaker an edge over rivals. It sports a new scheme for connecting to a PC's main circuit board that cannot be copied by other chipmakers. If PC makers adopt the Pentium II, from servers on down to network computers, that could lock out Cyrix and AMD.

THE HITCH. Of course, the cheaper Pentium IIs would still cost twice what competitors charge for their chips aimed at the low end. "You can't give lip service to this market," says Steve Tobak, Cyrix' vice-president for marketing. "All Intel is doing is window-dressing."

Intel has an answer for that, too. It's planning to wring costs out of other parts of the PC so that computer makers can afford Intel's chips. In mid-1998, for example, Intel will unveil a range of new products, including chip sets, the companion to the processor, that will combine many PC functions into fewer chips. These products could slice the cost of making a PC by $50. That means Intel would only have to cut its Pentium II price to $150 to match $100 rivals.

There's a catch. However, as sub-$1,000 machines become a bigger part of the market, analysts figure that the average selling price of Intel's chips will sag—from $235 this year to $220 in 1998. Every $10 fall in Intel's overall average selling price chops $900 million off its bottom line, according to analyst Vadim Zlotnikov of Sanford C. Bernstein & Co.

Grove is banking on different arithmetic. Intel already is making a dent in the server market, although mostly at the low end. This year, 97% of servers priced below $10,000 will have Intel Inside, as will three-quarters of machines costing $10,000 to $25,000. But Intel is only a bit player in an even more profitable segment: industrial-strength models costing up to $250,000. There, it competes against the muscle of Sun Microsystems and Hewlett-Packard.

That's where Merced comes in. This powerful 64-bit processor, which was co-designed with HP, features radically different technology that speeds software by running multiple tasks simultaneously. Merced will likely cost some $1,200 or more and will be aimed initially at top-dollar computers. By 2001, Merced could help Intel grab 41% of the high-end server market, predicts IDC.

THE MERCED TEAM

This powerful new processor, co-designed with Hewlett-Packard, speeds software by running multiple tasks at the same time

The workstation market could be yet another cash machine. The fast rise of Microsoft Corp.'s heavy-duty Windows NT software is pulling Intel processors along with it. Indeed, from around 50% of the workstation market a year ago, Intel/NT-based systems will surge to 86% by 2000, says IDC. Revenues from workstation and server chips over the next three years could total $26 billion, analysts say.

Will that be enough to make up the margin squeeze from low-end chips? A BUSINESS WEEK analysis suggests that it may. Selling just one Pentium II for $750 produces up to 10 times as much gross profit as a $150 Pentium II. If Intel sells 36 million high-end chips in the next three years, it could reduce the average price of every other chip in its portfolio by an average of $80 and still come out ahead.

Indeed, Intel execs insist that their gross margins will remain above 50%. But, says one Intel insider, "if the sub-$1,000 category grew to more than 50% of the PC market, we

JAMIE TANAKA

...can't sustain our gross margins."

Fear of collapsing computer prices at first drove Intel into denial about the low-cost-PC phenomenon. Until November, the company stuck to its well-honed marketing message, enticing customers to buy Intel's latest chips. That included a $100 million ad campaign this quarter to promote the Pentium II, including TV ads of chip-plant workers in clean room "bunny suits" dancing on Broadway.

But behind the scenes, Intel's managers were already hashing out a response to a market shift that had clearly caught them by surprise. The PC price collapse had been stunning. In January, 1996, a $1,300 machine from Circuit City Stores Inc. wasn't enough to run Windows 95 well: It bought only a 75-Mhz Pentium PC with 8 megabytes of RAM. A year later, the same money bought a 150-Mhz Pentium with 16 MB of RAM—ample enough to run Windows 95 and cruise the Internet. "Now, there's real meaty value available for less than $1,000," says Greg Gonzales, general manager of AES Technology, a small PC maker in Austin, Tex.

"GENIE IS OUT." Intel concedes that a permanent change has occurred in low-end PC pricing—similar, perhaps, to the 40% price drop triggered by Compaq in 1992 that slashed margins for both PC makers and retailers. "Once the genie is out of the bottle, you can't put it back in," says Otellini. Now, bargain-basement PCs are catching on in other countries and in businesses. PC makers, for example, plan to roll out $800 machines for corporate buyers after the New Year. But the crucial question, Otellini says, is whether low-cost PCs are bringing new buyers into the market.

Preliminary data from Compaq and Packard-Bell/NEC Inc. suggest that 40% of consumers are picking up their first PC. The rest are split between people replacing old machines and those buying a second or third PC for kids or parents. What's unclear—and worrisome to Intel—is how much cheaper models are cannibalizing sales of costlier ones. "We won't really know this for two years," says Grove. But IDC analyst Kevin Hause disagrees. "It's absolutely happening," he says.

Cyrix and AMD couldn't be happier. Cyrix, for one, has developed a chip tailor-made for this market. Cyrix' MediaGX, at the heart of Compaq's Presario 2200, is not just a processor but also contains some chip-set and multimedia functions. Putting

INTEL'S BEST MARGINS COME FROM ITS NEWEST CHIPS... AND IT GETS PC MAKERS TO PAY TOP DOLLAR FOR POWER

PRODUCT	INTRODUCED	LATEST PUBLISHED PRICE	EST'D MANUF. COST	EST'D GROSS MARGIN	TYPICAL SYSTEM PRICE*	PROCESSOR COST PERCENT
PENTIUM MMX, 233-MHZ	June 2, 1997	$300	$50	83%	$1655	18.1%
PENTIUM II, 266-MHZ	May 7, 1997	530	103	81	2363	22.4
PENTIUM, 200-MHZ	June 10, 1996	106	40	62	1252	8.5
PENTIUM PRO, 200-MHZ	Nov. 1, 1995	487	144	70	3190	15.3
AMD K6, 166-MHZ	Apr. 2, 1997	84	70	17	1040	8.1
CYRIX MEDIAGX, 180-MHZ	Feb. 20, 1997	81	45	44	799	10.1

*Not including monitor; other configuration details vary

DATA: COMPANY REPORTS, COMPUTER INTELLIGENCE, MICRO DESIGN RESOURCES

'WE PUSH TECHNOLOGY AS FAST AS WE CAN'

Few technology executives have had the success of Intel Corp. CEO Andrew S. Grove. In one of the fastest-changing businesses today, Grove has managed to keep Intel ahead of the pack in everything from PCs to video-conferencing. Along the way, Intel has captured some 90% of the PC microprocessor market and, by charging top dollar for its chips, become one of the most profitable companies in the world. Correspondent Andy Reinhardt spent a couple of hours with Grove at the company's headquarters talking about Intel's latest quick change: engineering chips specifically for cheap PCs and low-cost devices, a first in Intel's 29-year history.

Q: *Intel has always produced high-performance chips and, over time, moved the technology downstream. Why change that now and make new chips for cheap PCs and other inexpensive digital devices?*

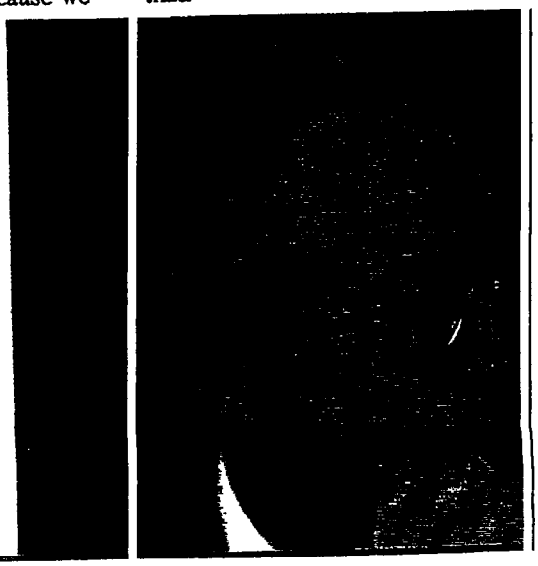
A: When all is said and done, we are a manufacturer—a high-volume manufacturer. And all the investment we put in technology and manufacturing capability is meant to produce things by the hundreds of millions. So for us to walk away from a market whose size is going to be measured in tens of millions of units per year, maybe bigger, is inconceivable.

Q: *Why not just use older technology—say, Pentium MMX chips—for low-cost devices?*

A: [Grimacing] You can see my reaction. We are what we are because we push technology as fast as we can. Our whole belief is that technology is good, and more is better. How could we slow down technology? It's not good for anybody: not for the software developer, not for us, and most important, it's not good for the consumer.

Q: *You recently pointed out that personal computers using the Pentium II chip had dipped below $2,000 in record time. For consumers, that's good news. But for Intel, doesn't this mark the shortest time yet for charging a premium on your latest chips?*

A: Well, wait a minute. The volume is much higher. How it will exactly work out, I don't know. The notion that we sit around and say: "Let's slow it down so we can charge more money..." I mean, this is the room where these discussions take place, and these walls have never heard that.



more features into a thumbnail-size chip lets Cyrix market a product for just $81 that matches the oomph of $130 worth of Intel and third-party chips. Some analysts and executives argue that in the low-end market, all-in-one chips are more important than top performance. "The whole system has to go onto a single chip," insists Brian L. Halla, the CEO of National Semiconductor Corp., which recently acquired Cyrix.

Nonsense, says Grove. Intel tried combo chips in the late 1980s when it developed the 386SL for notebooks. But instead of making buckets of money, the 386SL was a disappointment because PC makers shunned it as too expensive and clumsy. Today, Grove keeps a poster of the 386SL on the wall of his conference room as a reminder of what not to do.

NEW TACK. There's another reason for his disdain. Putting extra chip functions into the processor makes it bigger, taking up valuable real estate on a wafer—the disk of silicon on which chips are etched. The more chips you can produce per wafer of silicon, the more money you make. Case in point: One eight-inch wafer of Intel's tiny 233-Mhz Pentium MMX chips contains an estimated 211 chips worth $125,000. The same size wafer of larger 180-Mhz Cyrix MediaGXs is worth only $8,100, says Micro Design Resources. That's why Intel doesn't want to squander space by adding features such as multimedia and networking.

Despite Intel's aversion to chip integration, the company may be forced in that direction anyway. The target wouldn't be basic PCs, but far cheaper devices such as set-top boxes and information appliances. "They can't afford to sit on their hands," says analyst Drew Peck of Cowen & Co.

Chips for these gizmos cost a fraction of PC chips. Players such as Hitachi, ARM, and MIPS Technologies sell processors costing just $15—and dominate the new markets for handheld PCs, smart phones, and digital cameras. To compete, Intel would be forced to opt for low price over the latest technology. But for now, Grove is sticking to his more-is-better philosophy. He argues that the growing processing demands on new devices will require the power of a Pentium-class chip.

Take next-generation TV set-top boxes. In a consortium with Cisco Systems, Oracle, and Netscape Communications, Intel is proposing a design for these new devices. Intel envisions a range of set-top boxes, from $300 models that will receive TV and offer basic menus to $500 models that add Net cruising, E-mail, and PC games. Initially, Intel plans to pump out Pentium MMX chips for set-tops, moving upstream to Pentium IIs by late next year.

The giant chipmaker will try an entirely different approach for network computers (NCs)—stripped down PCs that leave most of the heavy lifting to servers. Intel's pattern is to retire old chips and then rechristen them for use in products such as printers and network switches. But in a surprise twist, Intel now says it will use rechristened versions of the Pentium for NCs.

Why even muck with such low-margin devices, given that PC sales are on a rip? Because, even with burgeoning PC sales, penetration into U.S. homes will barely hit 60% by 2000, leagues behind TVs, VCRs, and CD players. "Our business depends on expanding the market," says Ronald J. Whittier, an Intel senior vice-president. "We want to be in living rooms, cars, appliances."

Now, Grove just has to make sure his formula works for keeping the Intel profit machine in overdrive at the same time.

By Andy Reinhardt in Santa Clara, Calif., with Ira Sager in New York and Peter Burrows in San Mateo, Calif.

Cover Story

Q: *So is this a fundamental shift in your business model? In the next few years, are you going to turn into a producer of megahigh volumes of $20 processors?*

A: No. No. No. No. No. No. No. I don't think so.

Q: *I guess you mean no?*

A: You're trying to get black-and-white out of a very gray deal here. First of all, there are $20 processors in our portfolio today, in the embedded area [chips that go into products such as cars and printers]. I don't think the news is going to be in $20 processors. I think the news is going to be in penetration into a wider population—the proverbial 60% of U.S. homes that don't have a computer. Why don't those 60% have a computer? What we're trying to do is put a need in there, and at the same time, make this stuff affordable. And if that formula starts working, we want to make the same kind of money we're accustomed to. And the only way we can do that is to design for the target.

NEW HORIZONS

"I think the news is going to be in the penetration into a wider population—the proverbial 60% of U.S. homes that don't have a computer"

—*Andy Grove*

Q: *You've said publicly that, over time, you see Intel's gross profit margins slipping from 60% to 50%. Have you identified any kind of time frame?*

A: No. And we aren't prepared to, either. I don't want to be wedded to a particular percentage. How long is it going be? We'll make it as long as we're able to.

Q: *There's lots of talk about new markets emerging for TV set-top boxes, Internet phones, and PC/TV setups. What product category excites you the most? Which one offers Intel the most opportunity?*

A: These are different questions with different answers. The one I'm most excited about is streamlining the business computer to a network use. I've [long] felt that the predominant use of a business computer is as a communication device, and doing that right—infusing networking and management, a proper balancing of servers, intranets, and all that stuff—to me is the most fascinating. From a business standpoint, and from a technology standpoint, what I find more fascinating is the entertainment computer in the home. The stuff that has videophones and digital imaging and very alluring browsers, with lots of technology to move the interface to another level of capabilities. Actually, it's hard for me to choose between those two.

Q: *As Intel sells chips into new markets such as set-top boxes, your interests may diverge from your longtime partner Microsoft. An analyst commenting about the handheld market recently said you're "sleeping in separate beds." Is that true?*

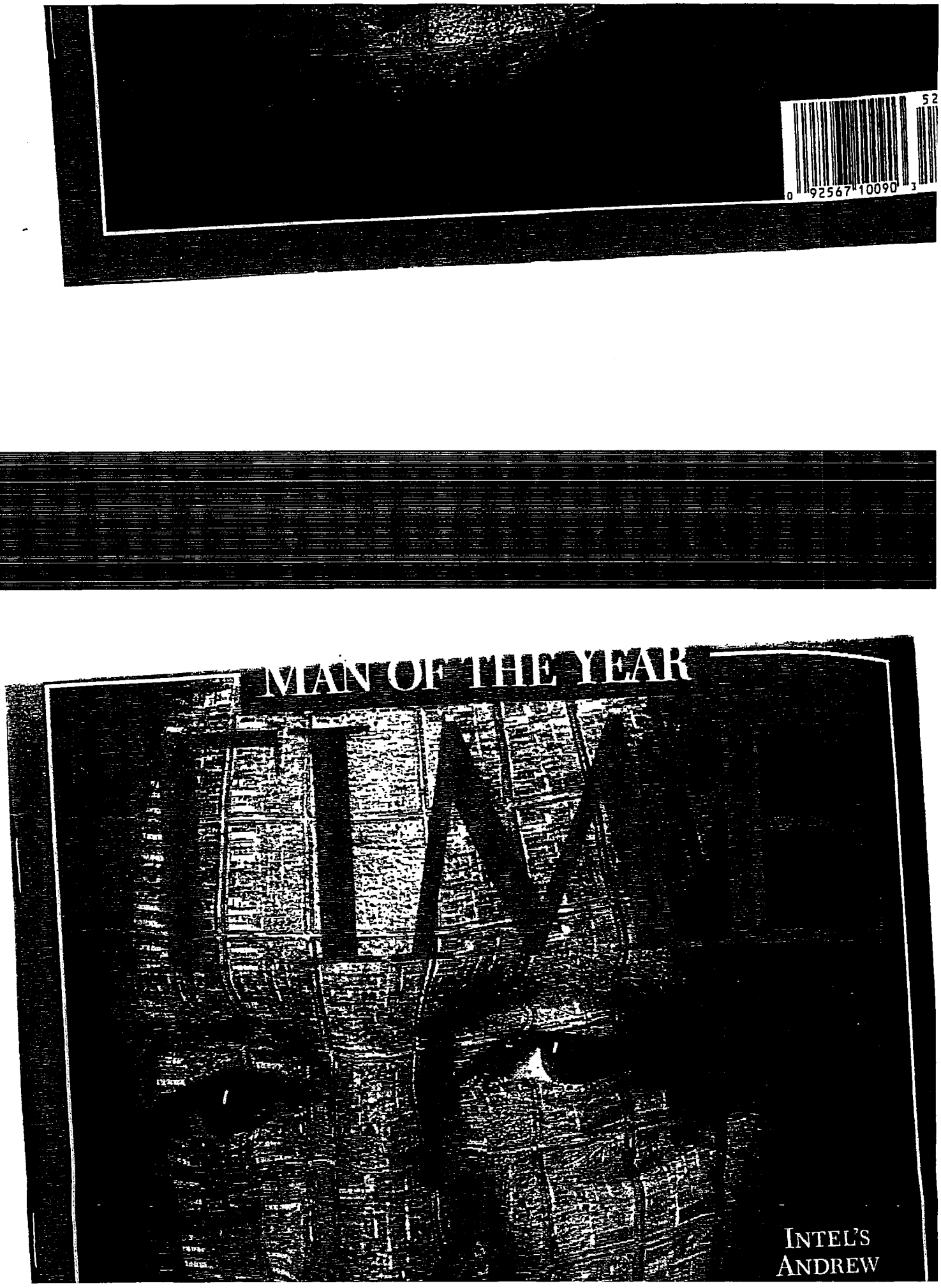
A: I don't think we've slept in the same bed, ever.

Q: *But what about the children [products] you've made together?*

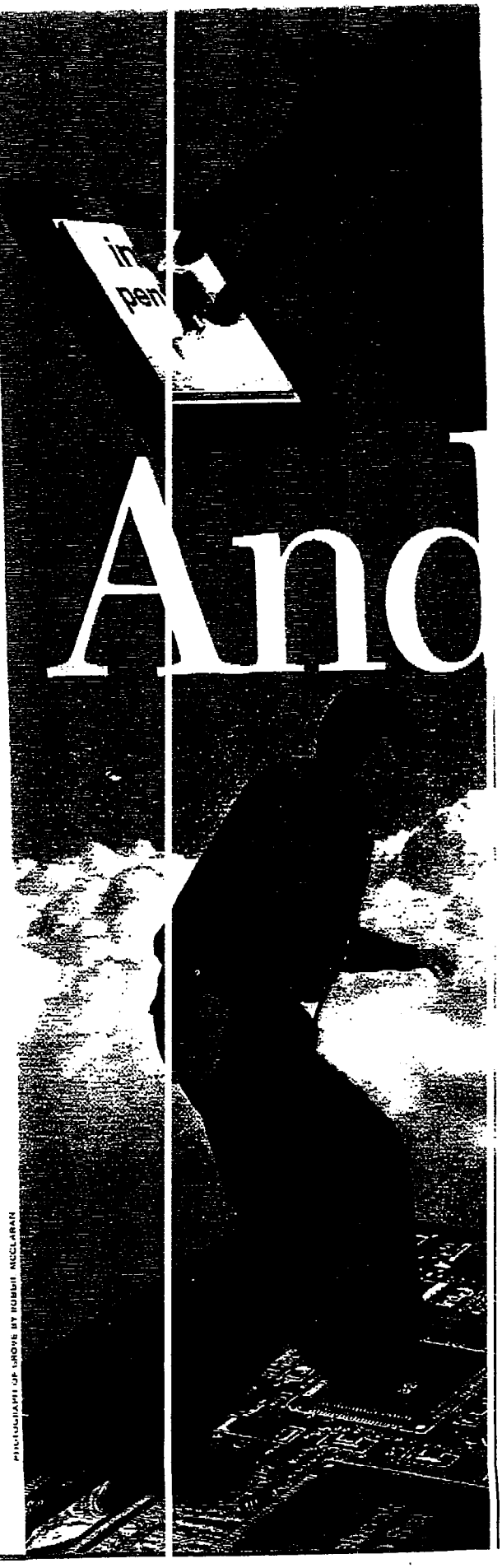
A: Well, that's right. But you can do that in separate beds. You can do it in the back of a car. [Laughs.] I dare you to use that one!

For an extended version of this interview, go to BusinessWeek Online at www.businessweek.com or America Online at keyword: BW.

Exhibit B-79


MAN OF THE YEAR
INTEL'S
ANDREW

... driven by the passion of Intel's



PHOTOGRAPH OF GROVE BY ROBERT MCELROY

By WALTER ISAACSON

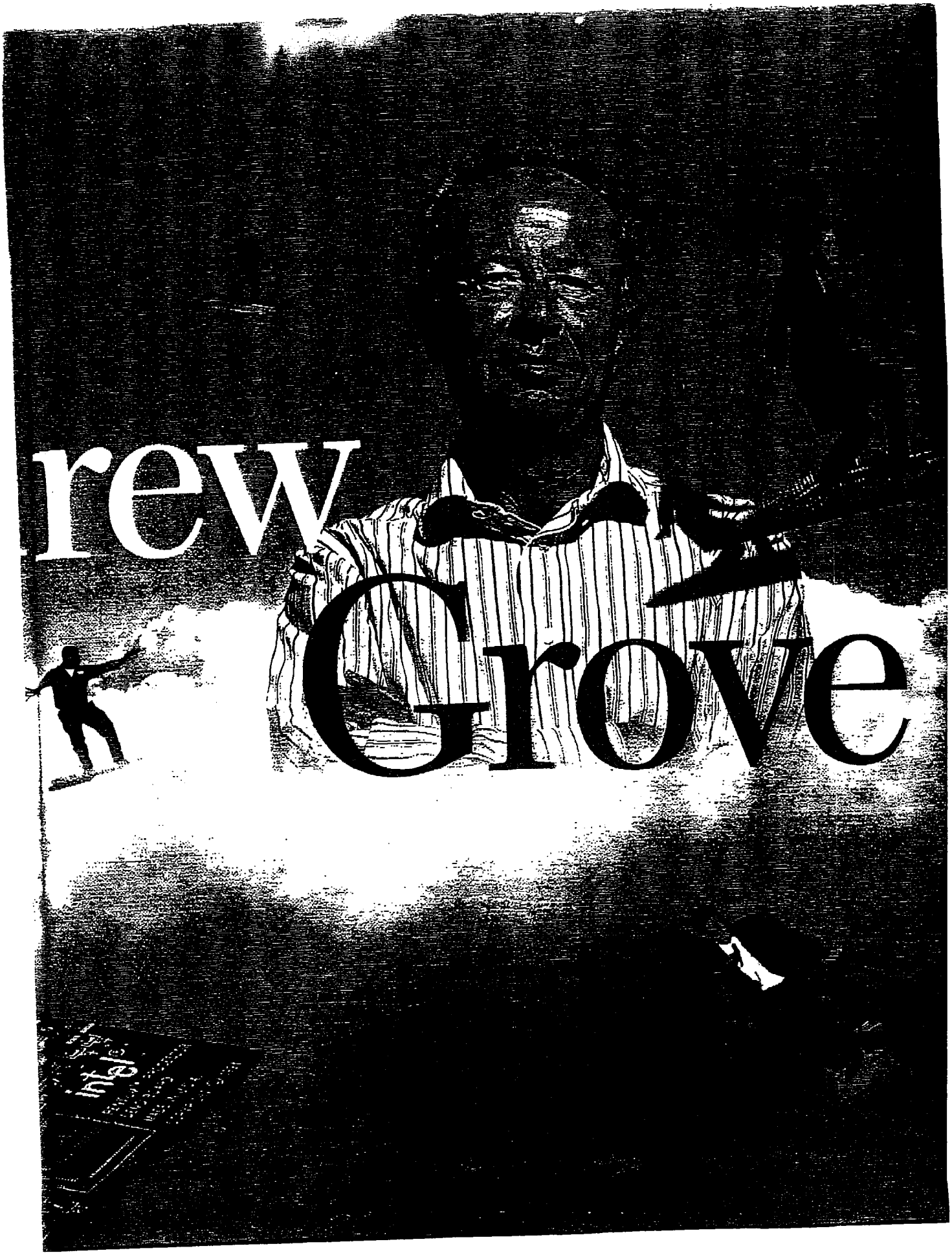
FIFTY YEARS AGO THIS WEEK—SHORTLY AFTER lunch on Dec. 23, 1947—the Digital Revolution was born. It happened on a drizzly Tuesday in New Jersey, when two Bell Labs scientists demonstrated a tiny contraption they had concocted from some strips of gold foil, a chip of semiconducting material and a bent paper clip. As their colleagues watched with a mix of wonder and envy, they showed how their gizmo, which was dubbed a transistor, could take an electric current, amplify it and switch it on and off.

That Digital Revolution is now transforming the end of this century the way the Industrial Revolution transformed the end of the last one. Today, millions of transistors, each costing far less than a staple, can be etched on wafers of silicon. On these microchips, all the world's information and entertainment can be stored in digital form, processed and zapped to every nook of a networked planet. And in 1997, as the U.S. completed nearly seven years of growth, the microchip has become the dynamo of a new economy marked by low unemployment, negligible inflation and a rationally exuberant stock market.

This has been a year of big stories. The death of Princess Diana tapped a wellspring of modern emotions and highlighted a change in the way we define news. The cloning of an adult sheep raised the specter of science outpacing our moral processing power and had a historic significance that will ripple through the next century. But the story that had the most impact on 1997 was the one that had the most impact throughout this decade: the growth of a new economy, global in scope but brought home in the glad tidings of personal portfolios, that has been propelled by the power of the microchip.

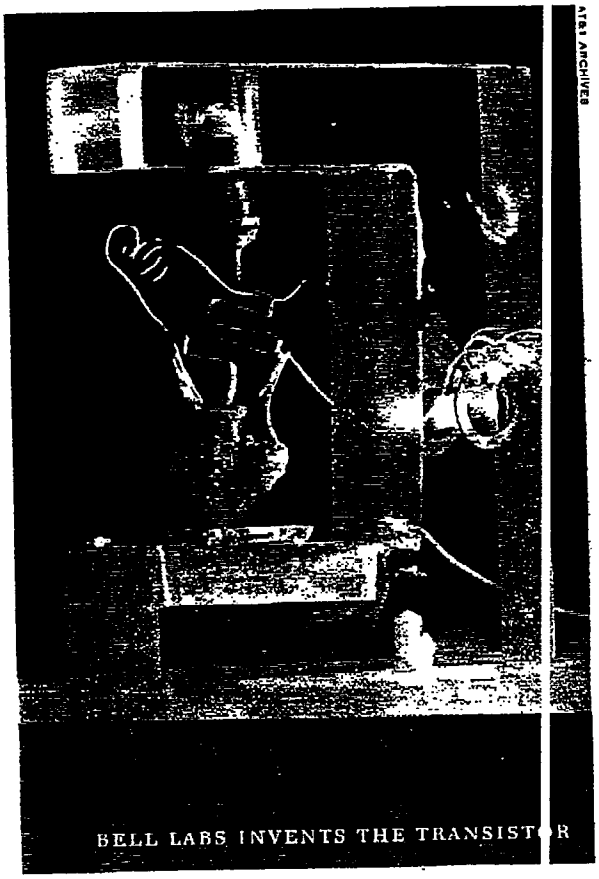
And so TIME chooses as its 1997 Man of the Year Andrew Steven Grove, chairman and CEO of Intel, the person most responsible for the amazing growth in the power and innovative potential of microchips. His character traits are emblematic of this amazing century: a paranoia bred from his having been a refugee from the Nazis and then the Communists; an entrepreneurial optimism instilled as an immigrant to a land brimming with freedom and opportunity; and a sharpness tinged with arrogance that comes from being a brilliant mind on the front line of a revolution.

Photo-illustrations for TIME by James Porto


rew
Grove

Like his fellow wealth builders of the digital age, Grove's mission is his product, and he shuns the philosophical mantle and higher callings often adopted by titans of an earlier era. Ask him to ruminate on issues like the role of technology in our society, and his pixie face contorts into a frozen smile with impatient eyes. "Technology happens," he clips. "It's not good, it's not bad. Is steel good or bad?" The steel in his own character comes through at such moments. He has a courageous passion alloyed with an engineer's analytic coldness, whether it be in battling his prostate cancer or in guiding Intel's death-defying climb to dominate the market for the world's most important product.

These traits have allowed Grove to push with paranoiac obsession the bounds of innovation and to build Intel, which makes nearly 90% of the planet's PC microprocessors, into a company worth $115 billion (more than IBM), with $5.1 billion in annual profits (seventh most profitable in the world) and an annual return to investors of 44% during the past 10 years. Other great entrepreneurs, most notably the visionary wizard Bill Gates, have become richer and better known by creating the software that makes use of the microchip. But more than any other person, Andy Grove has made real the defining law of the digital age: the prediction by his friend and Intel co-founder Gordon Moore that microchips would double in power and halve in price every 18 months or so. And to that law Grove has added his own: we will continually find new things for microchips to do that were scarcely imaginable a year or two earlier.



The result is one of the great statistical zingers of our age: every month, 4 quadrillion transistors are produced, more than half a million for every human on the planet. Intel's space-suited workers etch more than 7 million, in lines one four-hundredth the thickness of a human hair, on each of its thumbnail-size Pentium II chips, which sell for about $500 and can make 588 million calculations a second.

The dawn of a new millennium—which is the grandest measure we have of human time—permits us to think big about history. We can pause to notice what Grove calls, somewhat inelegantly, "strategic inflection points," those moments when new circumstances alter the way the world works, as if the current of history goes through a transistor and our oscilloscopes blip. It can happen because of an invention (Gutenberg's printing press in the 15th century), or an idea (individual liberty in the 18th century), or a technology (electricity in the 19th century) or a process (the assembly line early in this century).

The microchip has become—like the steam engine, electricity and the assembly line—an advance that propels a new economy. Its impact on growth and productivity numbers is still a matter of dispute and but not its impact on the way we work and live. This new economy has several features:

► It's global. Money now respects no borders. With clicks of a keyboard, investors trade $1.5 trillion worth of foreign currencies and $15 trillion in stocks worldwide each day, putting errant or unlucky nations at the mercy of merciless speculators.

► It's networked. Handbags from Italy and designer shoes from Hong Kong are available to Web surfers throughout cyberspace. clerical work or software programming can be outsourced from anywhere to workers in Omaha or Bangalore; and the illness of a child in Bali can be diagnosed by a doctor in Bangor.

► It's based on information. In today's knowledge-based economy, intellectual capital drives the value of products. In addition from 1990 to 1996 the number of people making goods fell 1% while the number employed in providing services grew 15%.

► It decentralizes power. As the transistor was being invented George Orwell, in his book *1984*, was making one of the worst predictions in a century filled with them: that technology would be a centralizing, totalitarian influence. Instead, technology became a force for democracy and individual empowerment. The Internet allows anyone to be a publisher or pundit, E-mail subverts rigid hierarchies, and the tumult of digital innovation rewards wildcats who risk battling with monolithic phone companies. The symbol of the atom age, which tended to centralize power, was a nucleus with electrons held in tight orbit; the symbol of the digital age is the Web, with countless centers of power all equally networked.

► It rewards openness. Information can no longer be easily controlled nor ideas repressed in societies kept closed. A networked world facilitates free minds, free markets and free trade.

► It's specialized. The old economy was geared to mass production, mass marketing and mass media: cookie-cutter products spewed from assembly lines in central factories; entertainment and ideas were broadcast from big studios and publishers. Now products can be individualized. Need steel that's tailored to your needs? Some high-tech mini-mill will provide it. Prefer opinions different from those on this page? A thousand Webzines and personalized news products are waiting to connect with you.

No one believes the microchip has repealed the business cycle or deleted the threat of inflation. But it has, at the very least, ended the sway of decline theorists and the "limits to growth" crowd, ranging from the Club of Rome Cassandras to more recent doomsayers convinced that America's influence was destined to wane.

The U.S. now enjoys what in many respects is the healthiest economy in its history, and probably that of any nation ever. More than 400,000 new jobs were created last month, bring

unemployment down to 4.9%, the lowest level in almost 25 years. Labor-force participation has also improved: the proportion of working-age people with jobs is the highest ever recorded. Wage stagnation seems to be ending: earnings have risen more than 4% in the past 12 months, which is the greatest gain in 20 years when adjusted for inflation. The Dow is at 7756, more than doubling in three years, and corporate profits are at their highest level ever. Yet inflation is a negligible 2%, and even the dour Fed Chairman Alan Greenspan seems confident enough in the new economy to keep interest rates low.

Driving all this is the microchip. The high-tech industry, which accounted for less than 10% of America's growth in 1990, accounts for 30% today. Every week a Silicon Valley company goes public. It's an industry that pays good wages and makes both skilled and unskilled workers more efficient. Its products cost less each year and help reduce the prices in other industries. That, along with the global competition that computers and networks facilitate, helps keep inflation down.

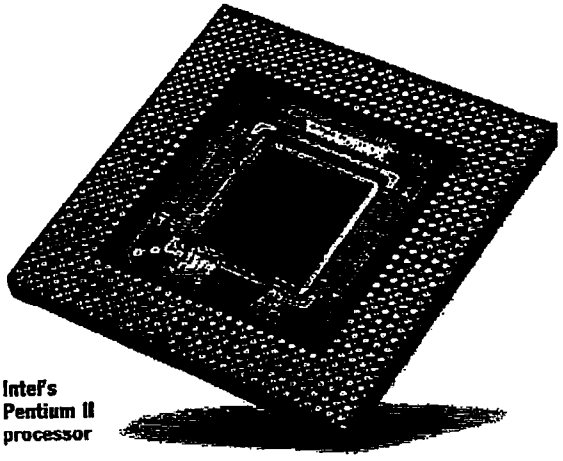
Economists point out that the Digital Revolution has not yet been reflected in productivity statistics. The annual growth of nonfarm productivity during the 1980s and 1990s has averaged about 1%, in contrast to almost 3% in the 1960s. But that may be changing. During the past year, productivity grew about 2.5%. And in the most recent quarter the rate was more than 4%.

In addition, the traditional statistics are increasingly likely to understate growth and productivity. The outputs of the old economy were simpler to measure: steel and cars and widgets are easily totted up. But the new economy defies compartmentalized measurement. Corporate software purchases, for instance, are not counted as economic investment. What is the value of cell phones that keep getting cheaper, or of E-mail? By traditional measures banking is contracting, yet there has been explosive growth in automated banking and credit-card transactions; the same for the way health care is delivered.

Even the cautious Greenspan has become a wary believer in the new economy. "I have in mind," he told Congress earlier this year when not raising interest rates, "the increasingly successful and pervasive application of recent technological advances, especially in telecommunications and computers, to enhance efficiencies in the production process." Translation: Inventories can now be managed more efficiently, and production capacity can more quickly respond to changes in demand. A fanatic for data, Greenspan has soaked up the evidence of surging corporate investment in technology and says managers presumably are doing so because they believe it will enhance productivity and profits. "The anecdotal evidence is ample," he says.

Anecdotal? Economists are supposed to eschew that. Yet the most powerful evidence of the way the Digital Revolution has created a new economy comes from the testimony of those embracing it. A manager at a service company in Kansas talks about not having to raise prices because he's reaping increased profits through technology. An executive of an engine company in Ohio tells of resolving an issue with colleagues on three continents in a one-day flurry of E-mail, a task that once would have taken weeks of memos and missed phone calls. At a Chrysler plant in Missouri, a shop steward describes labor-saving technology that his union members embraced because they see how their factory, which had been shut down in the late '80s, is now expanding. And the greatest collection of anecdotal insight, the stock market, has spent the year betting on ever increasing profits.

Of course the microchip, like every new technology, brings viruses. Increased reliance on technology has led to the threat of growing inequality and a two-tier society. Workers and students not properly trained will be left behind, opening the way for the social disruptions that accompanied the shift to the industrial age. At a time when they are most needed, schools have been allowed to deteriorate, and worker-training programs have fallen prey to budget austerity. For all the spending on computers and software ($800 billion in the U.S. during the past five years), the most obvious investment has not been made: ensuring that every schoolchild has a personal computer. Grove himself says this would be the most effective way to reboot education in America, yet he and others in the industry have been timid in enlisting in such a crusade.



Intel's Pentium II processor

ONE CHIP, 7.5 MILLION TRANSISTORS

In addition, though wage stagnation seems to be easing, workers' insecurity remains high. The layoffs that have accompanied technological change have been burned into their minds like code on a ROM chip. The weakening of labor bargaining power, inherent in a global economy where jobs and investment can be shifted freely, has led to what William Greider in the *Nation* calls a "widening gap between an expanding production base worldwide and an inability of consumers to buy all the new output."

There are also more personal concerns. Computer networks allow information to be accessed, accumulated and correlated in ways that threaten privacy as never before. Unseen eyes (of your boss, your neighbor, thousands of marketers) can track what you buy, the things you read and write, where you travel and whom you call. Your kids can download pornographic pictures and chat with strangers.

But these challenges can be surmounted. Technology can even provide the tools to do so, if people supply the will. As Andy Grove says, technology is not inherently good or evil. It is only a tool for reflecting our values.

If the Digital Revolution is accompanied by ways to ensure that everyone has the chance to participate, then it could spark an unprecedented millennial boom, global in scope but empowering to each individual, marked not only by economic growth but also by a spread of knowledge and freedom and true community. That's a daunting task. But it shouldn't be much harder than figuring out how to etch more than 7 million transistors on a sliver of silicon. ■

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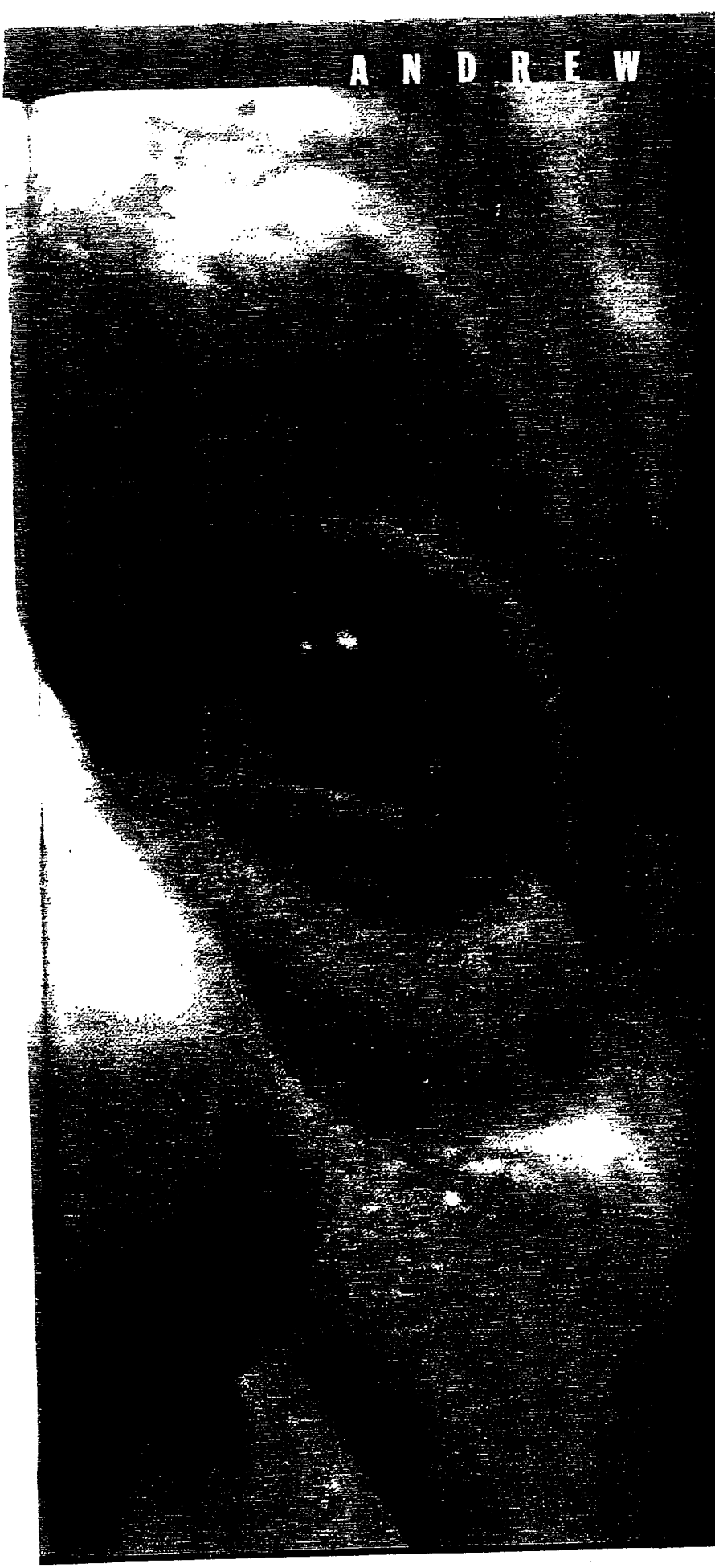
MAN OF THE YEAR

Survivor's Ic

ANDREW S. GROVE



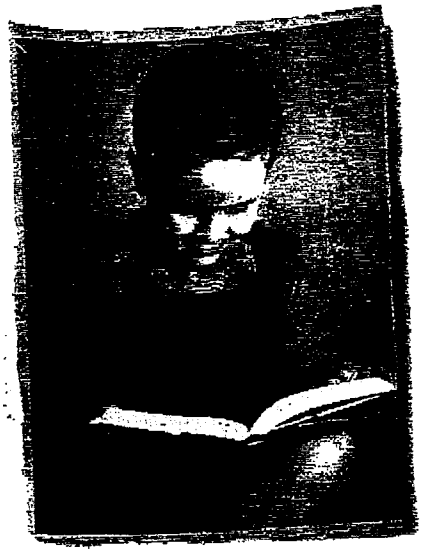
BUDAPEST: DECEMBER 1956.

The Red Army had been streaming into the city for a month, brutalizing Hungary's October revolution. The foggy nights, filled all fall with the sounds of ecstatic students, were now split with the jostle of machinery—10 divisions of Soviet tanks—and the uneven light of Molotov cocktails thrown through the rain. Fear blossomed in the dampness. The Premier vanished.

The boy—lean, strikingly handsome—hoped the tumult would pass. During the day he buried himself in schoolwork. Nights he passed at home. But over his books, across his strong Hungarian coffee, he heard rumors: the Russians were rounding up students. Children were disappearing. Trains were leaving for the frontier.

He longed to ignore the stories. He had already lived through the horror of the Nazis, outsmarting

Photographs for TIME by David Burnett—Contact

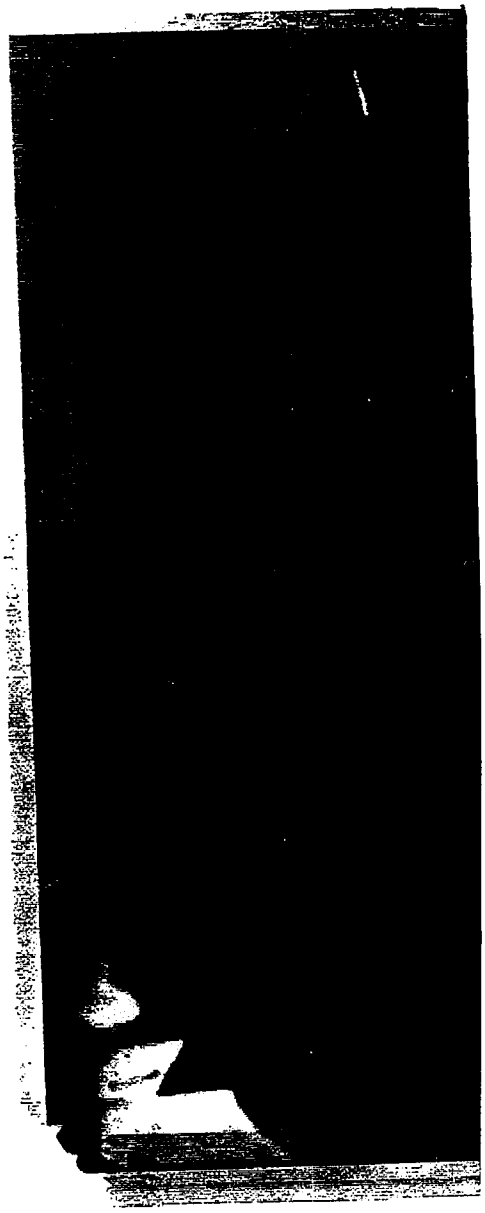


LEFT **Grove, the budding student. At age 4, shortly after this photo was taken, he nearly died from scarlet fever, which left him hard of hearing**

BELOW **Grove at 19 with his father, a dairyman, and his mother. He left them when he fled Hungary but brought them to the U.S. in 1965**

RIGHT **Grove as a graduate student next to the oil tunnel he used for Ph.D. research at U.C., Berkeley**

FAR RIGHT **Grove married Eva in 1958; the New York *Times* trumpeted Grove's CCNY graduation**



the SS, avoiding Budapest's brownshirts. One day his mother had bundled him into the house of a "courageous acquaintance," where they sweated out the pogroms of 1944. He saw his father return from the labor camps on the Eastern front, a proud, garrulous man shriveled by typhoid fever and chilled by pneumonia. Boys at school mocked him: before the war as a Jew, after the war because his father was a businessman (a dairyman, but that was enough). In his government file the boy was already an "enemy of the classes." He wasn't going to wait for the Soviets.

So he ran. With his best school friend he hopped a train westward, as close to the Austrian border as they dared. Twenty miles out they were tipped about police checkpoints ahead. The news was grim: the Russians were storming through the countryside, arresting everyone they could. The two would have to race the Red Army to the border. And since no one would guide them, they gathered the last of their money, the last of their courage, and bought directions from a hunchbacked smuggler who spoke of secret byways the Russians hadn't yet discovered.

And so, hours later, he found himself facedown in a muddy field somewhere near the Austrian border—but how near? Soldiers marched by, dogs barked, flares lit the night. Then a voice cried out, in Hungarian, the words paralyzing him with fear: "Who is there?" Even 40 years later, as he laughs at the memory, his eyes harden; he shifts his neck under his collar. Had the smuggler betrayed him? "We thought, 'Shit, this is it.'" The man shouted again. Now at the limits of his courage, the boy finally answered: "Where are we?" "Austria," came the reply. The relief poured cool as the rain. András Gróf, a name he would later Americanize to Andrew Grove, stood up and picked his way toward the future.

IT IS HARD TO DEFINE THE COMPO-nents of greatness, but surely survival is among their number. And Andrew Grove has always been, if nothing else, a survivor. From that terrifying night (or a hundred equally terrifying nights spent eluding the Nazis), Grove, 61, has been pushed by will to live as other men are fired by a taste

ANDREW S. GROVE

1906...

REFUGEE HEADING ENGINEERS' CLASS

Student Who Left Hungary in '57 to Get Degree From City College Today

A Hungarian refugee who three years ago didn't know horizontal from vertical—in English—will be graduated from City College today at the head of the class of engineering students.

Andrew S. Grove, the refugee, came to the United States in 1957 after the unsuccessful revolution in Hungary.

"I could read and speak English a little," he recalled, "but I couldn't follow the language when it was spoken, and I was bewildered by the technical terms in my science courses.

"Words like 'angle' or 'vertical' or 'horizontal' in a course on mechanics for engineers were foreign to me. I had to go over each day's work again at night with a dictionary at my side."

Mr. Grove, who is 23 years old, had studied chemistry in Hungary. He took chemical engineering at City College. But when he came to this country he was not sure he would ever continue his education because of the cost.

Almost Missed College

for power or money. Intel, the firm that Grove built, has survived in one of the most tumultuous industries in history, emerging to become one of the most powerful companies of our age, with a stranglehold on one of the transformative technologies of the 20th century. And though Intel's spotless clean rooms, its brilliant engineers and its bunny-suited workers seem far removed from that Austrian hillside, few places better reflect the sense of urgency with which the firm operates. Grove has it boiled down to a mantra that is as fresh as it is chilling: "Only the paranoid survive."

Intel, of course, has done much more than survive. Founded in the summer of 1968 by Gordon Moore (one of the great chemists of the century) and Robert Noyce (a co-inventor of the integrated circuit), it has blossomed under Grove's leadership into the world's pre-eminent microprocessor manufacturer. From a standing start in 1981, when IBM introduced the first personal computers, they have populated the planet at an astounding rate. And of the 83 million machines sold this year, nearly 90% get their kick from an Intel chip. So do antilock brakes, Internet servers, cell phones and digital cameras. And who knows what products not yet invented will be powered by the chip 10, 20 years from now?

Intel has ceased being just a Silicon Valley wonder. It has become a weather vane for an entire digital economy, a complete ecosystem of drive manufacturers, software houses and Web programmers

whose businesses depend on escalating PC growth. Because Grove and his firm control the blueprints of the PC, he is in the unique position of being able to tell customers what to do. Intel sets release dates for new chips, dictating the pace of the computer industry with the confident aplomb of fashion designers raising or lowering hemlines. It's the sort of ironfisted market grip that rarely exists outside economics textbooks: one supereefficient firm with monopoly-like returns gliding past competitors and, not incidentally, racking up huge profits. (Ten thousand dollars invested in Intel on the morning of Bill Clinton's first Inauguration would be worth nearly $90,000 today.)

It has not been easy. A history of the semiconductor business reads like a chapter of the *Iliad*: Unisem, dead of obsolescence; Advanced Memory Systems, killed by management; Mostek, slaughtered in a Japanese RAM invasion. Intel has endured crippling chip recessions, one Federal Trade Commission probe and a nasty public flogging over its flawed Pentium chips in 1994. Now the prospect of cheaper computers using cheaper chips, not to mention the threat of economic troubles in Asia, looms. But no firm does more reliable (or profitable) work in the tiny molecular spaces that Intel has colonized. It is the essential firm of the digital age.

Grove's dogma of relentless change and fearless leadership echoes from IBM in Armonk, N.Y., to the Great Hall of the People in Beijing. He is a perennial cover boy for the business magazines. Yet, he insists in his usual point-blank locution, "I haven't changed." He is a protective father of two daughters (he has asked us not to reveal their names or occupations), a spirited teacher (his Stanford business-school course is an annual sellout) and, almost incidentally, is worth more than $300 million. His 5-ft. 9-in. frame—honed by hour-long morning workouts, coiled by nervous energy—seems as tightly wired as one of his microprocessors.

At work he operates from the same kind of cubicle that everyone else at the company gets. (One perk: a view. Of the parking lot.) He keeps a support staff of three busy. He has developed his own special "mail codes"—*f/u* for "follow up"—that let him zip through his In box with special efficiency. A faithful assistant once put together a Grove-to-English dictionary for new assistants bewildered by the CEO's avalanche of time-saving abbreviations.

Grove is not all work: he skis, bikes with his wife Eva, listens to opera. He occasionally breaks out into a wild, disjointed boogie (his kids call it *groving* instead of grooving and recall the time Eva snapped her ankle on their shag carpet as the two danced to the sound track of *Hair*). The dance step is typical: Grove is a passionate, if disjointed man. He is a famously tough manager who, late at night, can still fill Intel's offices with a rolling laugh. He is a man who lost most of his hearing when he was young, but who soldiered through the toughest science classes flawlessly by lip reading and compulsive study. (His hearing would later be restored after five reconstructive operations over 20 years.) And though Grove says he is a "whiner" when it comes to minor ailments, he is a man who coldly eyed a diagnosis of prostate cancer, researched the options and ignored his doctors' advice to pursue his own, so far successful, therapy. "Ruthless intellectual honesty" is the way friends describe Grove's strongest characteristic. Andy has another word for it: "Fear."

ANDRAS GROF WAS BORN ON SEPT. 2, 1936, in Budapest, the son of George, the dairyman, and Maria, a bookkeeping clerk. His father, a gregarious, easygoing man with a strong, logical mind, left school early and taught himself business and accounting—everything he needed to know to run a small dairy service. Grove's mother, a spare, lovely woman, raised him in their two-room 19th century apartment. From an early age Grove was marked as the son of a capitalist and as a Jew. His parents hoped that with hard work he could overcome the prejudices.

SEMI-TOUGH **Intel was shaped by fire and finesse. Noyce, center in this 1975 photo, brought vision; Moore, astonishing brainpower; Grove, relentless drive**

At age 4 he nearly died. Budapest was swept by a scarlet fever epidemic, and young András succumbed. He remembers waking up in the hospital and thinking to himself, "I'm dead. I'm in my grave looking up at the sky." The fever left a mark: his eardrums were perforated like a colander, the result of a middle-ear infection.

What came next is the thing his daughters call "what Dad doesn't talk about." The rest of the world calls it World War II. Grove won't discuss his life in Budapest during the war. And though he travels the world, he hasn't returned to the city and swears he has "no interest in going back." He recently ran into billionaire George Soros, who was also a Jew living in Budapest in 1941. Soros has called the years the most important of his life. Grove calls Soros "totally different from me in that respect." The time, he insists, hasn't marked him. But late at night, over Scotch and sushi—Grove is partial to eel—the stories slip out.

His father disappeared in 1941—just vanished after being drafted into a work brigade. What had happened? No one knew, but they did know that Jewish men around Eastern Europe were disappearing like a morning fog. Then in March 1944, the Germans occupied Budapest and, Grove says, "they began rounding us up. Not us, actually, because my mother and I were in hiding, but Jews. Jews they were rounding up." He blinks and sips at his Scotch.

His eyes become brimful and wet. He speaks in his deliberate, still accented English: "I was eight years old, and I knew bad things were happening, but I don't remember the details. My mother took me away. She explained to me what it meant that I would have a different name, that I cannot make a mistake, that I had to forget my name and that I couldn't, if they said 'Write your name,' I couldn't write it down." He became András Malesevics. The Grófs, mother and son, living on stolen papers, pretended to be acquaintances of a Christian family. "They took us in at a very serious risk to themselves," he says. His wife Eva glances across the table, uncertain about this new territory Andy is wandering into. "What happened to them?" she asks. "Did you lose contact with them?" He pauses. Shakes his head. "I don't know. We didn't know them that well, you know. That's the strange thing." Quiet settles over the table again. I ask, "But they did the right thing?" Grove offers a chilling display of his pragmatism. He looks at me, dry-eyed now: "They did the right thing because it worked. If they had got killed over it, it wouldn't have been the right thing."

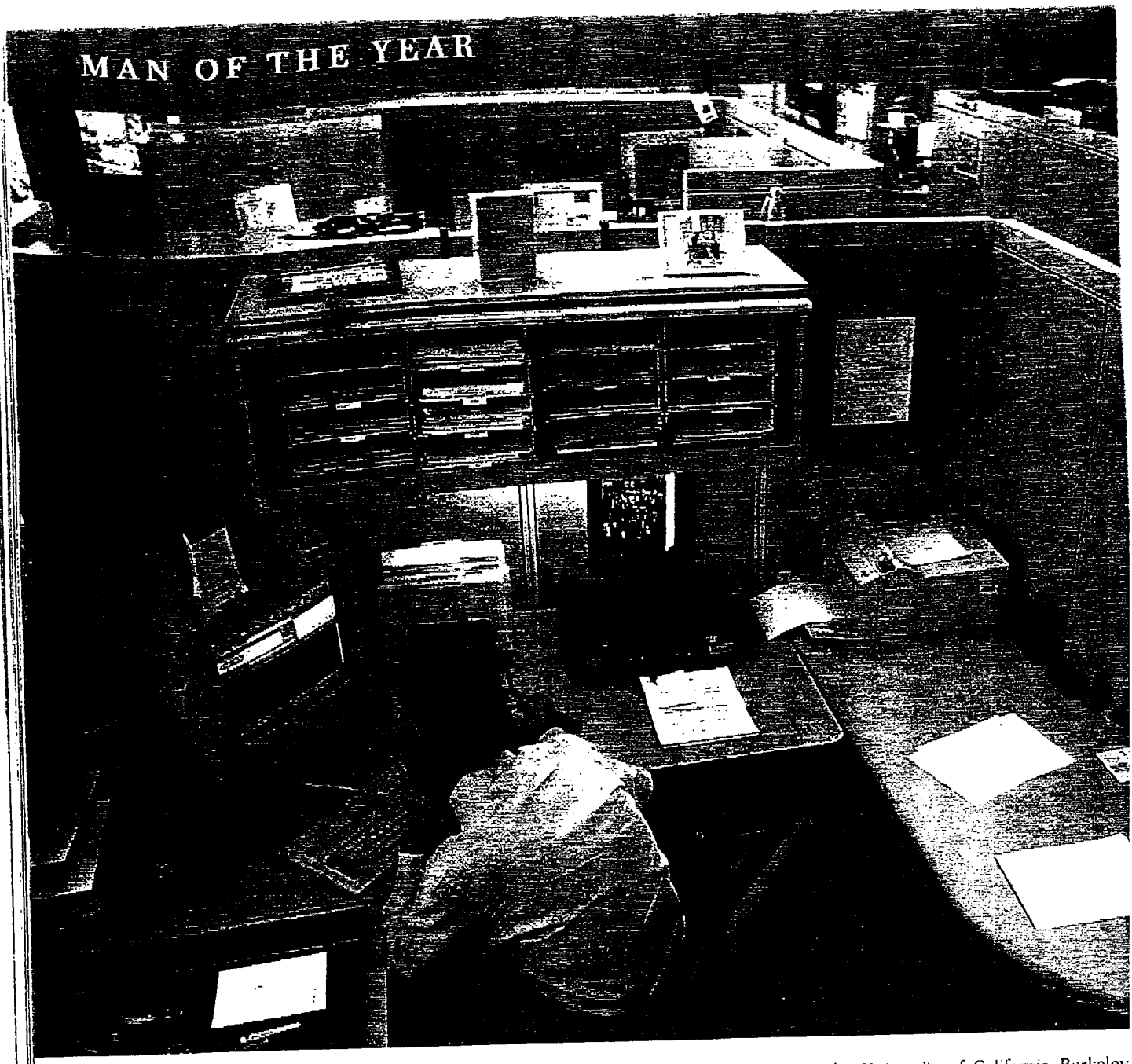
For Grove, the right thing after the war was to try to fulfill his parents' dream—his father, somehow, had survived the Eastern front—of his getting into college. Science was not his first passion. At 14 he joined a local youth newspaper and fell hard for the joys of journalism: writing, thinking, exploring. "I loved it," he recalls—until a relative was detained without trial and Grove became persona non grata at the paper. Nearly 40 years later he wrote, "I did not want a profession in which a totally subjective evaluation, easily colored by political considerations, could decide the merits of my work. I ran from writing to science."

In particular he ran to chemistry. His native curiosity made him a standout, especially after he discovered that he had an intuitive sense about molecules, an ability to mentally manipulate the tiny structures faster than most people could work them on slide rules and paper. "He was by no *means* a nerd," recalls Janos Lanyi, his best friend and the man who ran for the border with him. Lanyi recalls days when the two would row out to the center of a country lake, fold in their oars and study science in the springtime sun. "He was very outgoing," Lanyi says. "You could always hear him singing—in gym class, in lab."

This was another Grove passion: opera. Seduced by *Carmen*'s "Toreador March" as a youngster, Grove dreamed of becoming an opera singer. He took lessons and sang around school. And in the weeks before he fled Hungary, Grove and a handful of classmates sang the first, murderously lovely scene of *Don Giovanni* in a Budapest recital. Grove can't remember if he took the part of the footman Leporello (who beseeches, "*Potessi almeno di qua partir!*" [I wish I could escape!]) or the blackguard Don Giovanni (who bellows, "*Misiero! attendi se vuio morir!*" [Wretch, stay if you would die!]) in the performance. He took the Don's advice.

When the Soviets entered Budapest, Grove knew that was the time to leave. "There were growing rumors of people being rounded up on the street," he recalls. "I said, 'I could sit on my ass here and go out for a loaf of bread one day, and you'll never see me again. Or I can get out.' In today's terminology, one had an upside and the other didn't." Grove, not for the last time, bet his ass on the upside.

THE YOUNG MAN MADE HIS WAY TO New York City, where the apparent equality of American life astonished him. "I grew up to be 20 years old, and I was always told I was undesirable for one reason or another," he says. "I got to the United States, and I expected there would be some of the same because I was an immigrant. And there wasn't." From his spot in a cramped one-bedroom apartment in Brooklyn, where he was housed by an aunt and uncle who had left Hungary in the



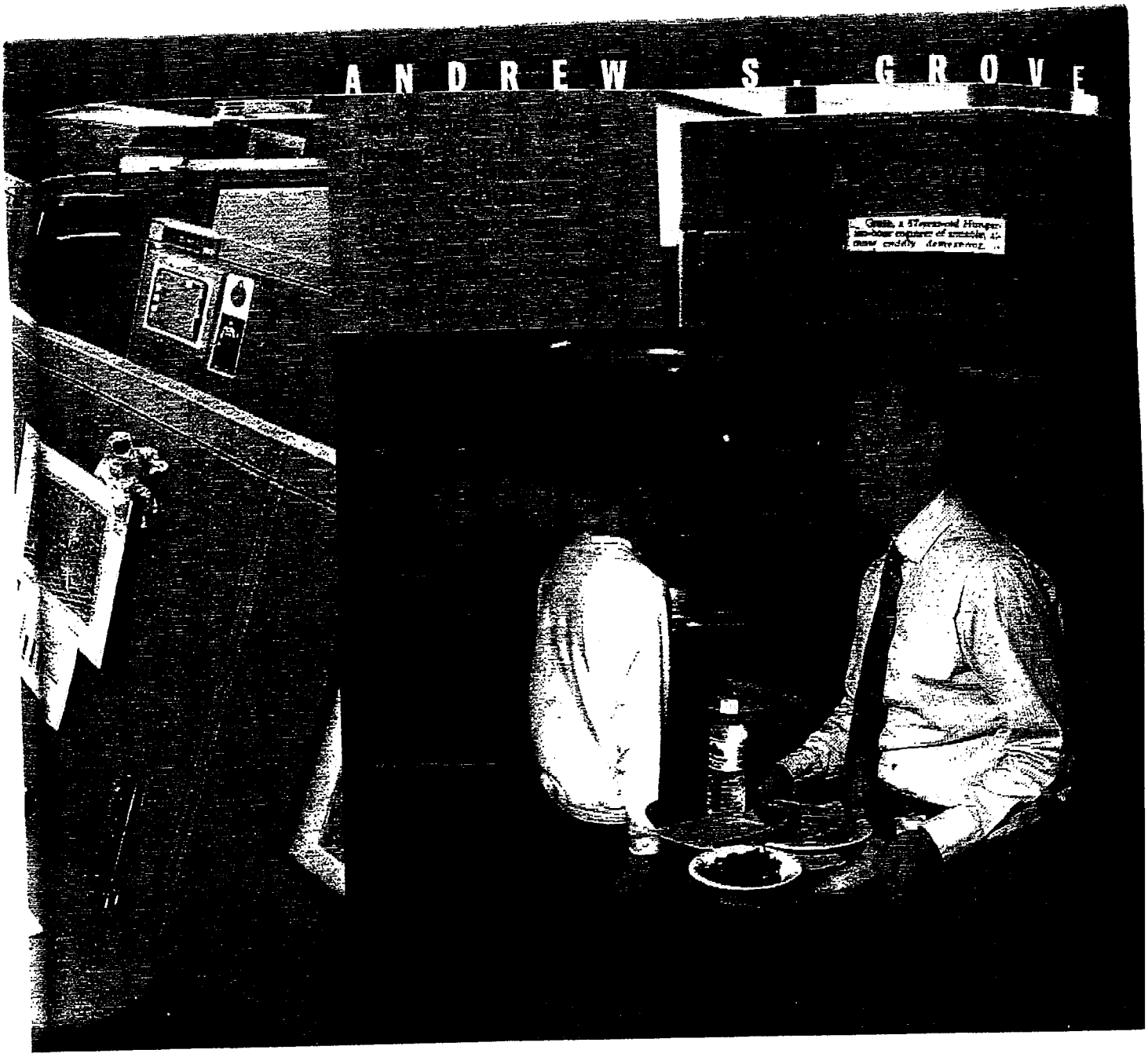
'30s, Grove devoured Eisenhower's America.

He enrolled at City College of New York, a free school that had become a kind of immigrant Oxford. He tore through the place—nearly all A's—and finished just shy of summa cum laude. (He totaled his car shortly after getting that news from a dean. "I got a C in Faulkner," he explains today, still annoyed. "My third year speaking English, and I'm reading Faulkner!") But when he graduated in 1960, the New York *Times* trumpeted the success. His professors knew they'd hear from him again. "I was a little astonished by that kind of ambition," says Morris Kolodney, now 86, a CCNY professor who was Grove's freshman adviser. "There's some advantage in being hungry."

He was also in love. His wife Eva, a refugee herself, recalls their first meeting at a New Hampshire resort where they both worked in the summer of 1957—he as a busboy, she as a waitress. Eva recalls the encounter ("He had a bad accent, even though he doesn't think so!") as a lightning bolt: "I walked into this room, and there were a bunch of guys. One shook my hand, and it was, you know, like shaking a limp fish. But then there was this really good-looking guy who shook my hand, and I was just like, wow!" She still smiles at the memory, rolls her blue eyes and swallows a giggle. In June 1958 they were married.

The two moved out to California, where Grove entered the Ph.D. program at the University of California, Berkeley. Again he was a star. When he graduated, he had the pick of American research corporations. Grove narrowed his choices: prestigious Bell Laboratories or Fairchild Semiconductor, a start-up staffed by a handful of brilliant engineers. Grove, who says he has "excellent antennae," listened to the Berkeley buzz and came back with a sense of the future: Fairchild.

In the early 1960s, the computer industry was in the midst of a benign revolution—and Fairchild was a breeding ground for revolutionaries. Early computers were fast, but attempts to make them faster were running into a thermodynamic wall: every time you asked the computer to think harder, it got hotter, like a gra-



student sweating his orals. The heat came from vacuum tubes, which acted as giant on-off switches, holding and releasing electrical charges. (A central "computer" tallied up all the on-off signals as ones and zeroes, and translated the results into real mathematics.) But the tubes, which sucked up huge amounts of energy, represented a limit on the power of these early computers.

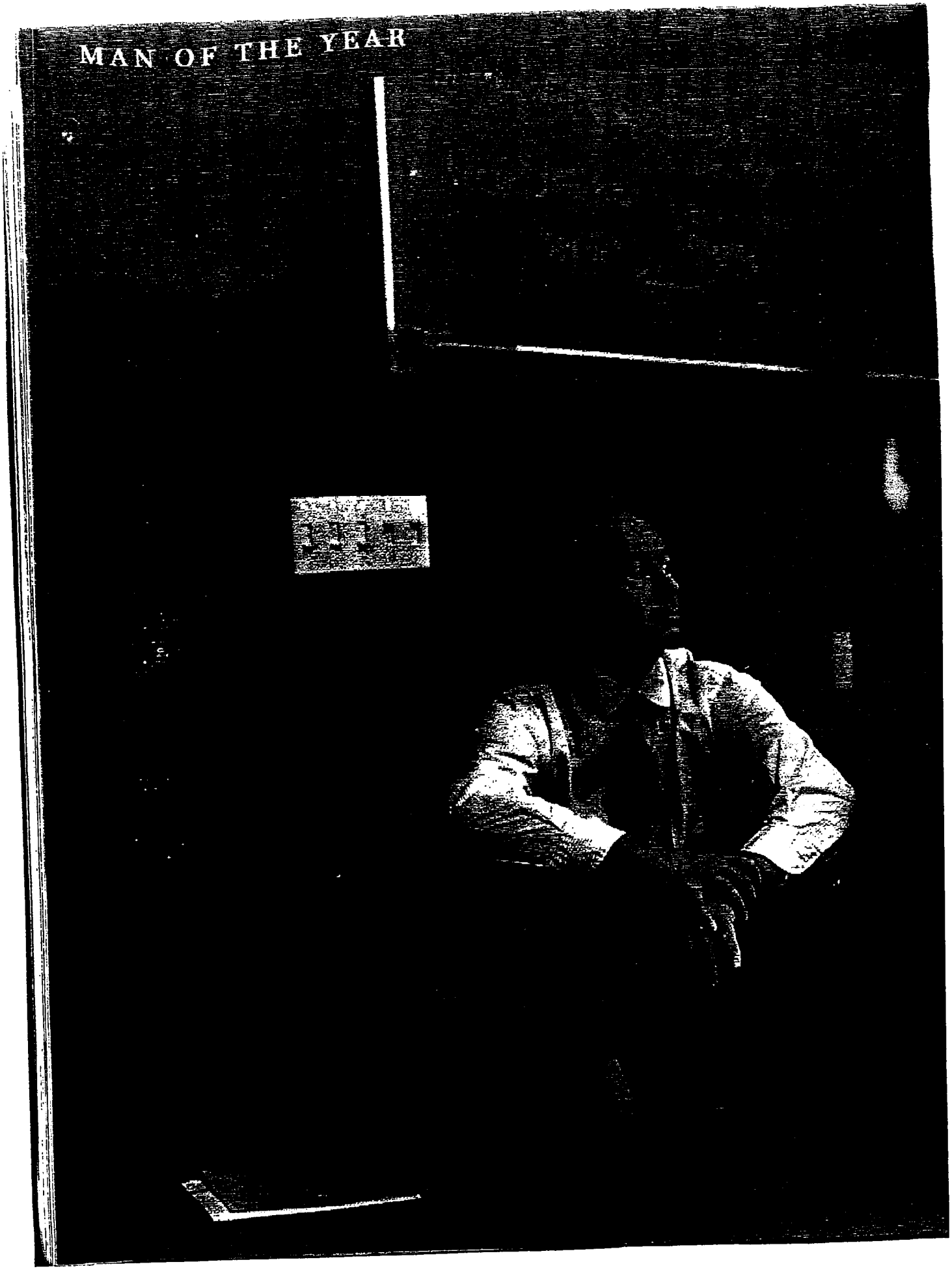
The logical solution was to replace the tubes: build a device that performed the same role—storing electrical charges—but that was less temperamental. The device was an electrical "switch" called a transistor, essentially a tiny electrical gate that controlled the flow of electrons that computers needed to do their math. Yet wrangling infinitesimally small electrons into place demanded phenomenally pure chemical surfaces. In the 1950s and '60s this was an act of near alchemy, certainly beyond the capabilities of most scientists. What the world needed was a reliable base for these circuits. What would it be?

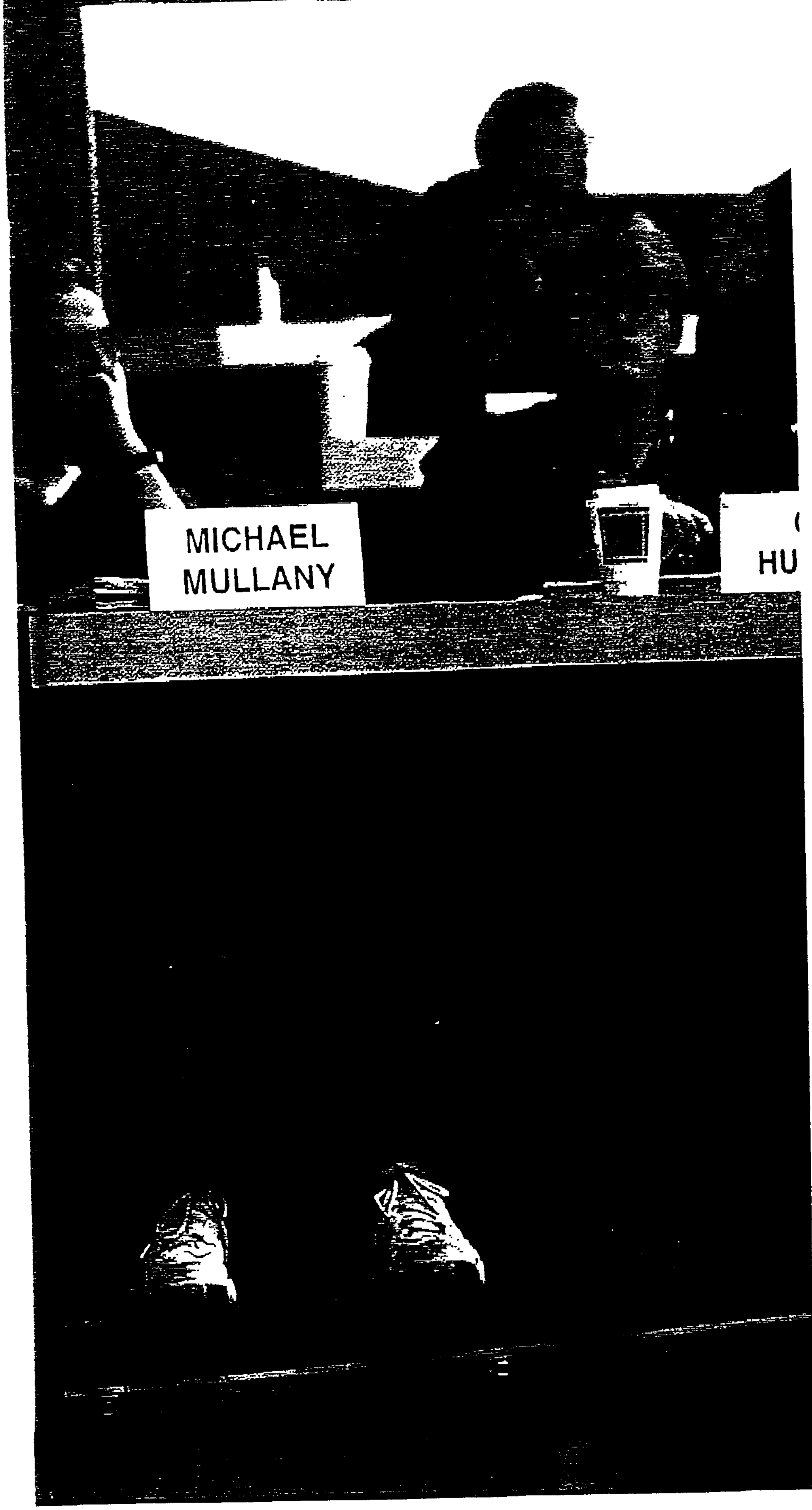
THE ANSWER, OF COURSE, TURNED out to be what gave Silicon Valley its name. Gordon Moore (who ran Fairchild's research arm and later became Grove's mentor as CEO of Intel) believed you could store those charges with an integrated circuit made by sandwiching metal oxide and silicon into an electrical circuit called an MOS transistor. Unlike trickier semiconductors, silicon is both a wonderful conductor of electrical charges and a nearly bottomless sink for heat, meaning it doesn't melt down as you push electrons under its surface at nearly light speed. Because it is made from refined sand, silicon is abundant as the earth.

And, in MOS, unstable as hell. One day you'd run a voltage through a sample and see one thing; the next day you could run the same voltage through the same sample and get a different reading. It was a nightmare. Of course, if you could fix that little problem, you'd be onto something big.

On his first day of work, Grove knew exactly none of this. He merely wanted to make a good impression. Nervous? You can't imagine. Here he was, trained as a

MAN OF THE YEAR





fluid dynamicist and [illegible] materials chemistry. The [illegible] promised him was pretty much the same. Someone asked him to study the electrical characteristics of MOS. Grove delivered a sharp, comprehensive report. His bosses were impressed.

Grove and two colleagues he discovered in the company cafeteria—Bruce Deal and Edward Snow—then set out to make silicon usable. After months of work, they discovered that most of the MOS instability was traceable to an impurity—sodium—introduced when the chips were cured. Like a drop of lemon juice added to a cup of milk, sodium soured the precious semiconductors. The discovery solved a fundamental problem in materials science and set the stage for the semiconductor revolution. Grove and his team won one of the industry's most prestigious awards for the work. At home, Eva got a hint that Andy might not be your ordinary Hungarian busboy. It was the kind of scientific triumph Grove craved—proof of the American meritocracy. At Fairchild, however, none of the suits cared.

BY 1968, NOYCE WAS FED UP WITH Fairchild. The firm was blowing up: engineers were leaving, top execs didn't understand the semi business, and science was being replaced by politics. Noyce phoned Arthur Rock, now the éminence grise of Silicon Valley investing, and told him that he and Moore wanted to start their own semiconductor company. Fairchild, he said, was finished. Rock (who holds nearly $500 million of Intel stock today) raised the money nearly instantly. Moore told Grove of the plan one day when they were at a conference in Boulder, Colo. The decision to join his bosses was made, Grove says, "almost instantly." Someone suggested the name Integrated Electronics, which was shrunk instantly to Intel.

Intel did not enjoy an uninterrupted march to greatness. The problem wasn't any lack of candlepower—Noyce, Grove and Moore were a dream team. The problem was the business itself. It kept changing. Just as Intel's leaders decided the future was in, say, selling dynamic RAM (a kind of short-term computer memory), messages started trickling back that sales were tanking, customers were evaporating and, ahem, top management had better pick a new strategy. It was a miserable

CLASS ACT At Stanford, Grove teaches survival in the digital age. It's "like learning from God," says a pupil

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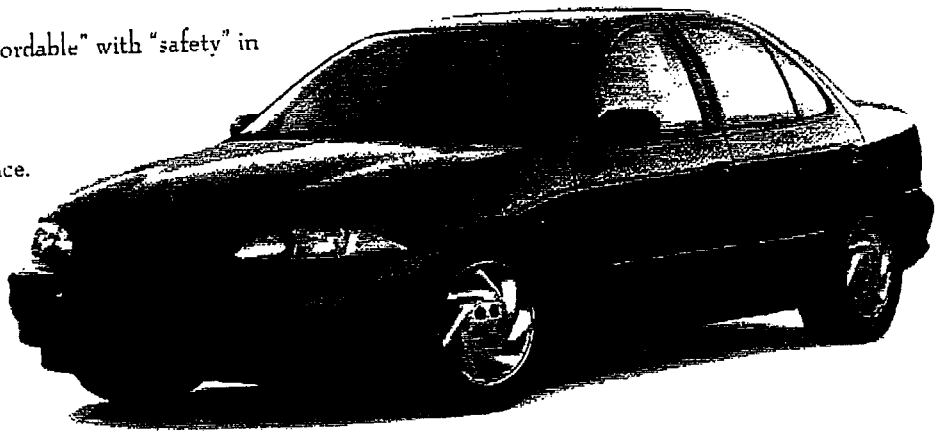

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way to run a company, desperately leaping into lifeboats, always at the last possible moment. One night Grove dreamed he was being chased by a pack of wild dogs. "It was a pressure cooker," he says.

BUT MISERY LOVED THE COMPANY. The years of anguish produced rich rewards made possible by some neck-snapping breakthroughs. The key to the success dated back to an insight Moore had in 1965. Sitting down with a piece of log paper and a ruler, he drew a simple graph. On the vertical axis he tracked the growing complexity of silicon chips, along the bottom he ticked off time, and then he plotted the points out a few years. The resulting line, he saw, showed that chip power doubled roughly every 24 months, even as costs fell by half. The rule (amended to 18 months) became known as Moore's law. Though it frustrates consumers—it's the reason that $2,500 PC you bought will be obsolete in a year—the law has given Intel a road map, allowing the company to shift resources ahead of demand rather than jumping crazily after the fact.

Moore is a shy, methodical man. He has the careful outlook of someone who has spent his life trying to get molecules to behave. Early on Moore saw something special in the young Hungarian and decided to nurture it. In 1970, as the two were strolling through the zoo in Washington, D.C., Moore told Grove, "One day you'll run Intel." For the next two decades Moore shaped and polished Grove's thinking about everything from plastic packaging to Japanese trade. "He was," says Grove, "a father figure." In 1979 Grove became president, and when Moore stepped down as CEO of Intel in 1987, Grove stepped up. (At 68, Moore still works three days a week but probably not for the money: he holds close to $7 billion worth of Intel stock.)

For all the fear it inspires in competitors, Intel looks harmless enough. The firm's Santa Clara headquarters is an off-blue Dilbert maze, a land of cubicles, coffee cups and security badges. Bob Noyce, who died in 1990, smiles reassuringly from a 5-ft.-high black-and-white photo in the lobby. Inside, Grove and Moore work from 8-ft.-by-9-ft. cubicles accessible to anyone bold enough to wander by for a chat. There are no special privileges. If Grove rolls in late, he has to prowl Intel's jammed lot looking for a space just like any shavetail engineer. Craig Barrett, 58, Intel's president, sometimes shows up in lizard cowboy boots, often en route to his ranch in Montana from Japan or Malaysia. They are known universally as Andy and Craig. The just-folks culture did not originate at Intel—credit Bill Hewlett and David Packard—but Intel perfected the industrial-size version. Last winter the company announced that all its employees would begin to receive lucrative stock options. Already Intel has produced thousands of millionaires.

Do not confuse casual with unchallenging. Grove sets the tone, and it is always demanding. The people (mostly men) who work for him have inherited (and enforce) an engineer's creed that brings a bloodless "just fix it" intensity to everything from human relations to fabrication. "When I was at Intel, one of the most important values was discipline," says venture capitalist John Doerr, who worked for the firm for six years in the 1970s. "Andy Grove had no tolerance for people who were late or meetings that ran on without a purpose. It wasn't that he was a hard ass; it's just the nature of their business. There's no room for error."

For years Grove enforced that narrow margin with a quick, violent temper—the polar opposite of his mentor, Moore. New employees at Intel suspected it was a management trick: Andy getting mad to get results. What they discovered was that the anger was real. Grove had an internal code of excellence, and when someone didn't live up to it, he hammered him. In 1984 FORTUNE named him one of America's toughest bosses. Sometimes even he recognized that he had gone too far. "After I cooled down, I apologized," he wrote of one '80s encounter that had him bellowing at a manager. "But by then it was too late. A loyal, experienced and valuable manager had been so hurt that no apology could get through to him."

But the merits of that no-b.s. culture became clear as the world around Intel began to crack. Starting in 1976, the firm sailed into one iceberg after another: weak demand for memory chips, factory problems, ruthless Japanese "dumping." In 1981, when Intel steamed into yet another exhausting chip slowdown, Grove decided that instead of laying off employees he'd order Intel's staff to work 25% harder—two hours a day, every day, for free. The "125% solution" turned Santa Clara into a sweatshop (a few particularly dyspeptic engineers took to wearing sweatbands to highlight the point), but Grove's message was clear: Intel would do whatever it took.

The biggest iceberg came in 1994, when Intel released millions of flawed Pentium chips. The problem was small, an internal routing glitch that caused a mathematical error. Intel took solace from the fact that this occurred so infrequently that most users could leave their PCs on for years without running into a problem. Intel's hyper-rational Grove-trained engineers told concerned callers not to worry unless they were planning to sweat some advanced astrophysics problems that weekend. The callers hung up and dialed CNN. And the New York *Times*. And the *Wall Street Journal*. Grove, who was on a Christmas ski trip at the time, was floored. "He had really punched himself in the face," says one of his daughters, who watched him grimly ride the lifts for three days. "We were all like, 'This too shall pass,' but he just was inside himself."

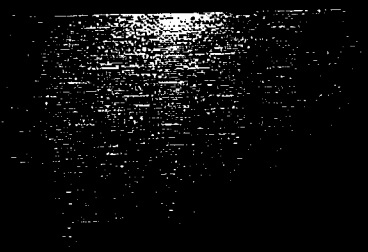
After a weekend conferring with his

MARK RICHARDS, CONTACT FOR TIME

BINARY RELATIONSHIP Grove and wife Eva, married 39 years, still ski and bike together. They met while he was working as a busboy at a resort

Maybe the reason America's glued to the tube is the tube.

Trinitron



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... Grove decided to switch courses. And on Monday, with typical Intel discipline, he turned the company around. By the middle of the next week, Intel had agreed to spend $475 million to replace Pentiums. The company even offered in-home service. It was, says Grove, "a difficult education." It also turned, perhaps, into a bonanza. Intel's name became better known than ever. And once the firm agreed to replace any chips, customers began to appreciate its commitment to getting things right.

The real message was simpler: confronted with another disaster, Intel had survived. Again. It was as if Grove's personality and the characteristics that had served him best over the years—courage in the face of fear, passion in the face of discomfort—had been transmitted like tiny electrons into the substrate of Intel's tens of thousands of employees. Grove had saved the chip. Next it was time to save himself.

"ANDY, YOU HAVE A TUMOR." HE felt a warm unease. Grove is a steely man, but these weren't words he had expected to hear at 58. Grove discovered in late 1994 that he had a tumor growing on the side of his prostate gland. It wasn't immediately life threatening, but the doctors couldn't seem to agree on a course of action.

Grove, the scientist, pursued one on his own. He hit the library. "I read until I found that when I picked up an article, I had read it," he recalls. "I hadn't done that much research since I got my Ph.D." In the mornings Eva would drive to Stanford and copy the latest journals. At night Grove would paw the trove, looking for something new.

A doctor suggested surgery. Grove continued reading. "If this wasn't your life here," his wife said to him one morning as he pored over charts, "I'd say you were having fun." Well, Grove was kind of having fun—his scientific mind was engaged by the prostate-cancer research. A second doctor offered another opinion: radiation-seed therapy. Grove kept reading. "You know," says Eva, "I was surprised by how he reacted to the disease. Normally he's a baby. Anytime someone has a headache, he's saying, 'Oh, it's cancer.' But this time it really was cancer. He was tough." A third doctor, a third opinion: the best solution is to watch and wait. Grove listened to them all and then picked the course he's chosen for years. "I bet on my own charts."

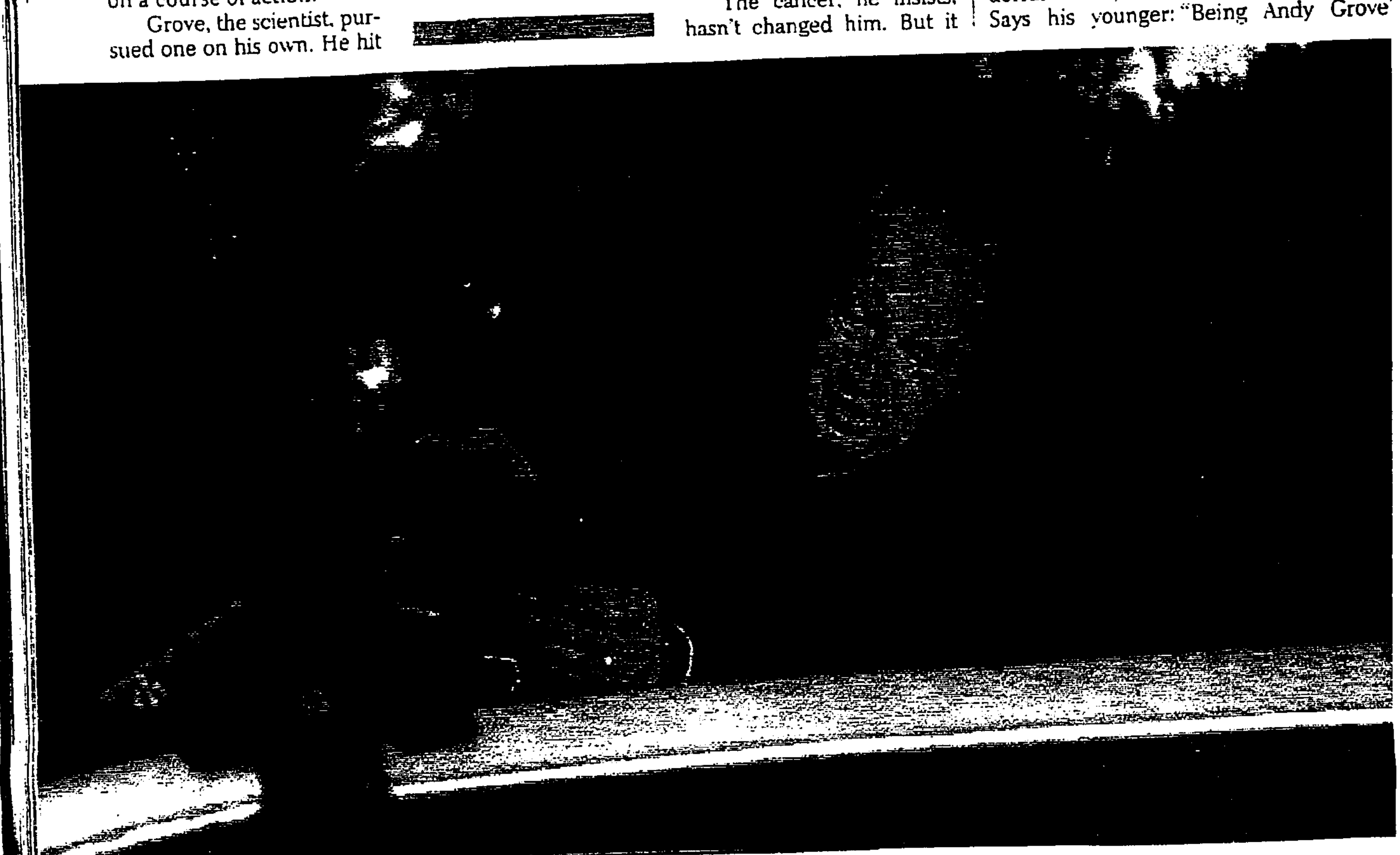
Grove bet his life on a "smart bomb" of high-dose radiation, a new procedure that he felt offered the best chances. It seems to have put the cancer away for now. Grove won't say he's "recovered," just that levels of the telltale prostate-specific antigen (PSA) in his blood have sunk.

TIME OUT Grove guards his leisure hours. He reads—pulp thrillers are a favorite—and hits the slopes when he can

The cancer, he insists, hasn't changed him. But it has changed ... most days is like a ... immune—tofu, veggies, five servings of fruit a day, a palmful of antioxidant pills. He continues to dig through prostate-cancer research and sits on the board of CapCure, Michael Milken's prostate-cancer foundation. Last spring Grove uncovered a yet-to-be published study showing a link between calcium intake and the spread of prostate cancer to the rest of the body. He rushed to the CapCure doctors and persuaded them to reduce a longstanding recommendation to take calcium supplements. Who could argue with a man who was betting his life?

He has PSA tests every four months now. "It's an unusual thing. Most cancers don't have scorecards," he says. "But here you go and give blood, and a day later, they tell you the rest of your life basically." Andy Grove, face to face with death three times a year. Surely he must *love* this. "I worry about it the last month of the four. It's not logical, but it's very observable and real. When I enter the month of the test, my stress notches up. And then as I get closer I get more nervous. And then when they draw the blood, it's unimaginable—a new level of anxiety starts, and it continues until I get my results back." The tests, so far have yielded only one surprise: Andy Grove isn't bloodless after all.

His children could have told you that years ago. Grove has always been fully flushed with fatherhood. "He was a wonderful father," recalls his older daughter. Says his younger: "Being Andy Grove'



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child isn't for the faint of heart. But if you can roll with it, it's great." Case in point: Grove always worked to include the kids in his business travel. But he made the girls write reports on the countries they were visiting: Italy, Spain, England. A nickel a page. "That's how we'd get our spending money," recalls a daughter. "Luckily, my grandparents would kick in a little more." Grove's parents moved to the U.S. in 1965. His father died in 1987; his mother lives in California.

His marriage to Eva—the daughters call her "Eva the Saint"—has been the essential constant in Grove's life. He is clearly still nuts about her. There is a world-worn gentleness in their touch. She takes care of him: lays out his breakfast, orders the small details of his life, helps him find whatever he needs. Grove's big eyes—which in meetings can penetrate the skull of an unprepared executive at 50 ft.—are at their softest when he rests them on Eva.

THE TWO OF THEM ARE STILL TRYing to figure out what to do with all their money. The wealth is a surprise. Eva recalls the day when Grove got options in 1968: "I had higher hopes for Intel than he did. When he got his first options, I thought, 'Hmm. If that gets to be $100, then ...' And he said, 'Ach! It's never going to be *$100*." Try $10,000. The Groves today are worth north of $300 million.

He could almost not care less. Grove doesn't spend his money on planes, giant homes or fast cars. He lives on a relatively modest scale. He and Eva plan to leave their daughters "comfortable," but the bulk of his fortune will go to charity. The Groves have endowed 10 chemistry scholarships at CCNY, made contributions to prostate-cancer funds and supported the International Rescue Committee, which brought Grove from Vienna to America. (He still remembers the day the IRC representative in Manhattan sent him out on Fifth Avenue with a blank check to buy the best hearing aid he could find.)

Mostly, though, he continues to fret about Intel's future. The firm faces dozens of challenges—from cheap PCs to antitrust investigations—and Grove is engaged in the meta-movements of the technology world more deeply than ever. Says David Wu, an analyst at ABN AMRO Chicago: "I used to have a lot of problems with Intel, but every time I asked them a question, they had already thought about it."

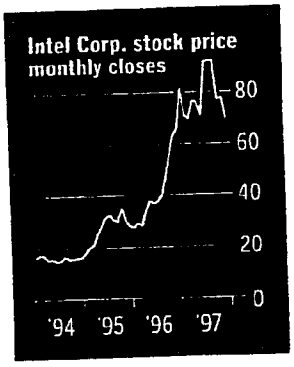
Grove polishes Intel strategy twice a year with a half-day "state of the industry" report to Intel's directors and top executives. After the presentation, the CEO submits to an intellectual firing squad led by the likes of Rock and Moore. Grove's performances, say those who have seen them, are a mixture of showmanship and brainpower, as if Albert Einstein were guest host of the *Tonight Show*. "Andy thinks faster than most people, certainly than me," says Rock, who has made billions betting on firms such as Intel and Apple. "I would hate to compete with Intel."

So do Intel's competitors. If Grove is tough on people inside Intel, he is brutal with competition. Intel's current victims are Advanced Micro Devices and National Semiconductor, but no single firm poses much of a threat. Intel, says AMD CEO

Another Silicon Valley Recession?

By DANIEL KADLEC

IF ANDY GROVE IS SO SMART AND TECHNOLOGY COMpanies so hot, why are Intel and just about every other tech stock falling off a cliff? Wasn't it only four months ago that our Man of the Year's company proudly sported a $100 stock? Now it's at about $70. Click on that, new-era geeks. The stock market may be chaotic and irrational from day to day, but over longer periods it's a pretty fair measuring stick for what's coming. The message here is that no boom lasts forever, and the one that Grove and tech-dom have been riding this decade is ripe for some kind of interruption.

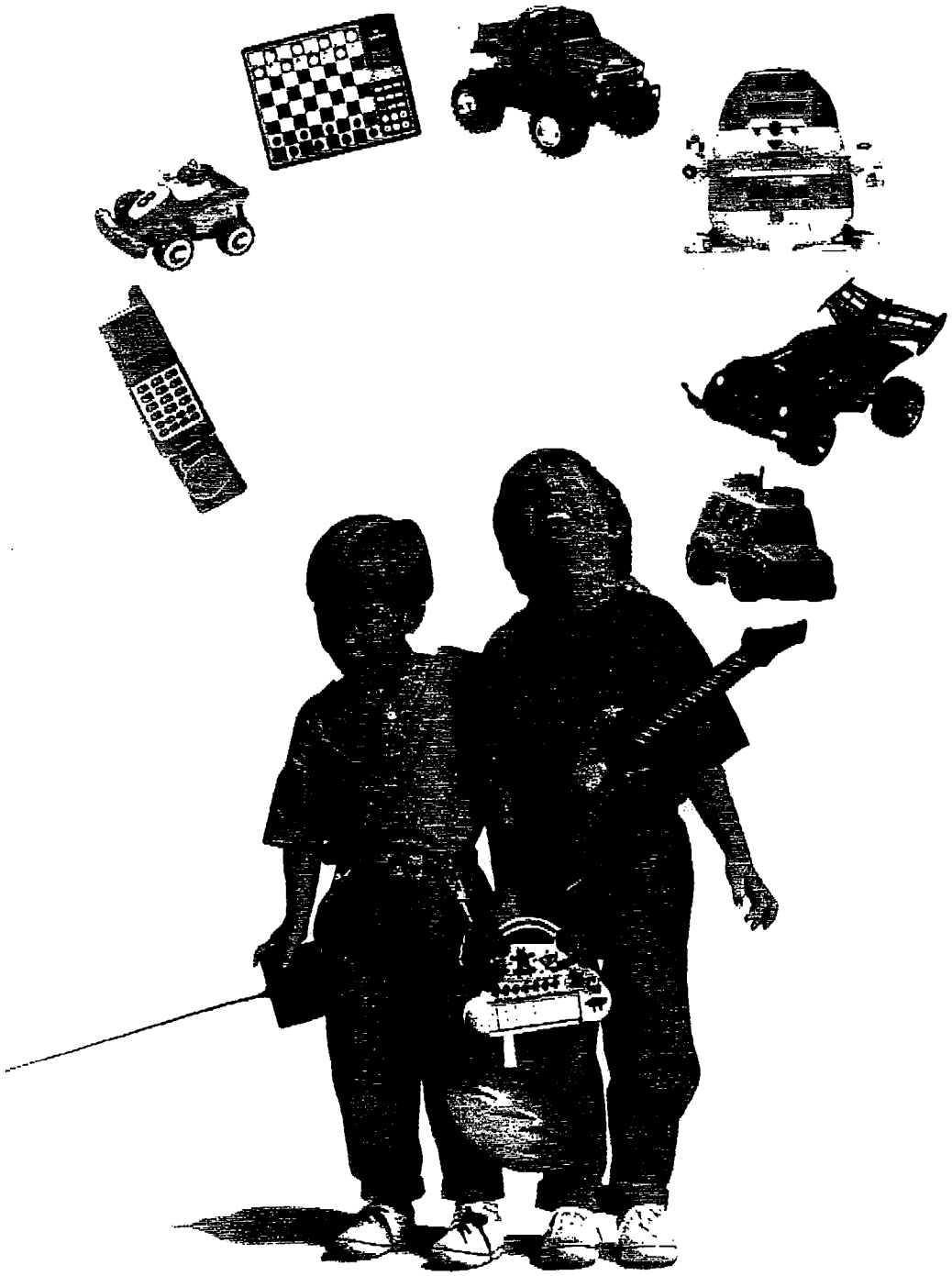


That's not to say the pace of technological change is slowing. In fact, you haven't seen anything yet. Companies like Intel, Microsoft, Compaq, Cisco Systems and Oracle have plenty more cyber stuff on their drawing boards. What's in question is how much of it they will sell, how soon and at what price. One obvious problem is Asia. Tech companies were doing a lot of business there before the region's economies imploded. Intel, for example, has been getting 28% of its annual revenue there and will surely feel a sting from the slowdown.

White-hot competition is another part of the equation, and it's a jarring reality pretty much across the tech board. Success breeds imitators. Imitators flood the market with goods. Prices (and profits) come down. Again, take Intel. It supplies nearly 90% of the microprocessors in PCs worldwide—a more commanding grip than even Microsoft's stranglehold on PC operating systems. But to protect its position, Intel has cut semiconductor prices faster than anyone expected as rivals Cyrix and Advanced Micro Devices compete furiously to supply cheaper components for the $1,000 PCs now taking the world by storm. Intel's profit margin has eroded from nearly 63% a year ago to an estimated 58% today, says analyst Caroline Gangi at Lehman Bros. Margin erosion may be Intel's biggest problem. The company expects the figure to hit about 50% before leveling off.

Even before those obstacles surfaced, tech companies faced serious questions on the demand side. Firms have invested heavily in PCs and other "must-have" gadgets in the past few years. Sure, the stuff is really cool. But executives want to see payback before they extend the binge. It's unclear whether PCs and, say, Internet connections have made office workers more productive or simply more distracted. (Websites that seem to get the most hits are those featuring swimsuit models.) Real-world users of technology shouldn't fear that the ship is sinking. It's not. But for now tech stocks are, and investors may not get whole for a while. It's worth noting, though, that even with its recent 30% decline, Intel's shares are up fourfold in three years. Tech stocks, on average, have risen about twice as fast as the Dow Jones industrial average since June 1994. That pace was unsustainable no matter how much Grove and company may change the world. ■

What do kids really want?



Preschoolers to teens... we've got their favorite radio-control vehicles, action-packed games and imaginative electronic toys. For our store near you, call 1-800-THE-SHACK® or visit us at www.radioshack.com.

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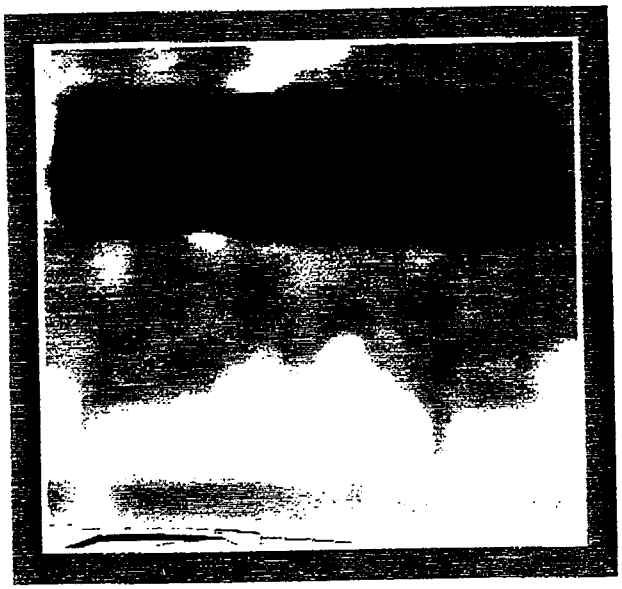
You've got questions. We've got answers.

Jerry Sanders, makes it nearly impossible to get access to the big customers—Compaq, Dell, Gateway—that make for economies of scale. "That's where Intel makes it tough," says Sanders, another Fairchild alum. "In my view Intel goes right to the edge—and sometimes over it—to exclude people from providing chips to those guys."

Grove has so effectively squashed the competition that his biggest worry isn't the rumblings of AMD but the strategic risk of a slowing PC market. The hottest-selling PCs this year have been dirt-cheap, sub-$1,000 models. Growth there could wreck Intel's business model. Says Drew Peck, an analyst at Cowen & Co.: "You can't sell a $500 processor in a $1,000 PC." And though cheap PCs are a tiny part of the overall market—businesses generally buy pricier PCs—Intel may be heading into a sea change. Intel's buoyant stock is off 30% from its 52-week high (though it is still up nearly 100% in the past 18 months). Some analysts expect to see the stock at $100 a share in 1998, but many investors don't understand Intel's business. To them the $1,000 PC looks like death.



Grove, of course, sees it as an opportunity. He is in the midst of rejiggering Intel's operating model so the firm can make money on sub-$1,000 PCs. That means taking more risks and finding new applications for Intel chips. Intel has also invested hundreds of millions to "seed" demand for PCs. The firm is betting on interactive multimedia (imagine watching the Super Bowl and clicking on a player to see his stats), cable modems that speed Internet delivery and audio software that makes your PC sound like the local THX multiplex. Grove has reviewed dozens of battle plans for the company and finds the same fault with them all: not radical enough.

As Von Clausewitz craved the decisive battle, Grove hungers for the decisive risk, the bet that will guarantee Intel's future. "Are we missing something?" Grove mused one day this spring over a lunch of tofu and ketchup, settling his silverware into a moment of quiet. "Sometimes," he says in a rolling baritone, "the risk of omission is greater than the risk of commission."

There are other worries. The Federal Trade Commission launched a second probe of Intel this fall. Though the firm has escaped with a clean bill of health in the past, its dominant market share may look like a fat bull's-eye to trustbusters. Intel's close relationship with Microsoft—tech insiders refer to a WinTel duopoly—does seem to make competition more difficult. Grove, for one, isn't slowing any plans because of the government. "We're very careful," he says, "and clean."

Though no one talks of retirement (Grove considered it in 1987 but changed his mind), the CEO is building a management legacy. Last spring the company tapped Craig Barrett, a former Stanford materials-science professor and longtime Intel executive, as the new president and Grove's successor. And behind Barrett is a chain of bright, driven engineers all lusting for the top spot. Meet intense contenders like Intel V.P.s Paul Otellini and Sean Maloney, and you'll have little worry about a leadership vacuum. Chairman emeritus Moore sometimes comes to the office, looks around and says he sheepishly thinks, "I'm not sure I could get a job here today."

FOR NOW, GROVE ISN'T GOING ANY-where. He is as engaged as anyone else at the company. After 8 on most nights, after even the diehards have cleared out of the office, Grove's cubicle still glows against the window. Rock, who has known Grove for 30 years, puts the persistent passion down to a calm inner knowledge. "Andy has been exactly the same person. He hasn't changed. That's the beauty of it. He has no airs." That Grove could remain still in the midst of such a turbulent business is perhaps the best explanation of his success. Other companies chased fads or indulged their arrogance. Grove remained constant.

And vibrant. Grove is filled with laughter and an eager joy. He is a compassionate man, with a face that seems most relaxed when it's tucked into a smile. His youngest daughter recalls her disco-theme wedding reception last summer, when her dad grabbed her cape and a friend's crown and headed out to the dance floor with a big Grove grin. There, in front of family and friends, was András Gróf in a silver-lame cape and rhinestone tiara *grooving* to *Le Freak* as around the world, Intel plants silently cranked away to his rhythm. What were the odds of that?

Back in his school days, when Grove was studying fluid dynamics, he might have been able to tell you. As a young chemist, Grove had to master probability theory—it was the only way to predict how some molecules and atoms will behave. One of the ideas that holds probability theory together is that it is possible to understand the odds of an enormously complex event as a series of yes-or-no questions. The theory works by taking the most complicated series of events and boiling them into binary choices: either *this* can happen or *that* can happen. This is called the binomial theory.

The binomial theory can, for instance, tell you the odds of one man flipping a coin 8,000 times and getting 8,000 heads—about 1 in 10^{2400}. It's a big number, but figure the odds on this: a young Hungarian boy either survives scarlet fever or he doesn't. He either goes to a concentration camp or he doesn't. He either escapes the Russians or he doesn't. Grove, who believes he is good, also suspects he's been amazingly lucky. And if you're trying to understand why his power hasn't bred arrogance, it's because most of the time, when he takes a look at his life, Andy Grove thinks he's the guy who flipped heads 8,000 times in a row.

"Lucky or good?" It's one of the first questions you'll get from Grove. He was lucky enough to escape Hungary; good enough to make it to the U.S. Lucky enough to find CCNY; good enough to graduate first in his class. Lucky enough to join Intel; good enough to lead it to the top. Lucky enough to marry Eva and have two healthy daughters; good enough to raise them, dancing and smiling, into beautiful American women. That's the kind of life it's been. Andrew Steven Grove, TIME's Man of the Year 1997: lucky, good, paranoid. —*With reporting by* ***Daniel Eisenberg/New York***

For more information, visit TIME's *Man of the Year Website at* **time.com**

Exhibit B-80

BusinessMarketing
NETB2B.COM
THE NEWSPAPER OF BUSINESS-TO-BUSINESS MARKETING

Dennis Carter, *Intel VP-sales and marketing, says the company saw the advantage of co-op advertising early on.*

Intel-ligence inside

Sharp, savvy marketing propelled the chipmaker to world dominance; can the momentum continue?

BY BRADLEY JOHNSON

INTEL CORP. redefined a market, built one of the world's great brands and is on a path to be the world's most profitable company. There's only one problem.

"One day, it seems to me, they have to fail," says veteran Intel observer Martin Reynolds, VP-technology assessment at Dataquest, a San Jose, Calif., market research company.

Fail? Mr. Reynolds doesn't mean bankruptcy. He means Intel's cycle of successfully creating demand for its ever faster chips will be broken.

CASE STUDY

This is a story about the role ingenious marketing has played to help build an incredible company. Mr. Reynolds acknowledges Intel's remarkable past, present and potential.

But Santa Clara, Calif.-based Intel, the world's No. 1 tech advertiser, is not a perpetual motion machine; it has mind-boggling challenges ahead to keep up its marketing-driven momentum.

President-CEO Andy Grove says it could cost Intel almost $10 billion early in the next century to build a factory to make the chips now on the drawing board.

This would be the largest single pri-

See INTEL, Page 22

CMP's ... surges i... Simmon... CompPr...

BY JACK EDMONS...

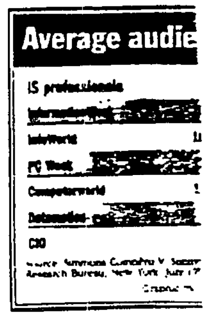
CMP MEDIA'S ... have jumped ... readership ... tech publications in Sim... ket Research Bureau's C... closely watched annual ... computer professionals

IW scored an average ... ence size of 201,563 ... systems professionals, ... from second place last ... fourth place in the study ... ago.

International Data ... *InfoWorld* moved to se... third place last year. *PC Week* slumped to third ... IDG's *Computerworld*, ... three years ago, came in ... the second year

IW's strong readership ... in CompPro ... caps a ... sharp advertising growth ... magazine, as well. In the fi... 1997, the magazine was th... growing tech publicatio... pages and revenue. Its ... were up 28% to 2,122 ... six months of this year, an... mated advertising reve...

See SIMMONS...



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ROUNDUP

CASE STUDY

PowerCerv thrives with new focus

PowerCerv successfully makes the switch from a service-based company to one focusing on product.

Page 3

IN THE NEWS

Schonfeld forecasts strong ad spending

Advertising spending is on the rise, with the computer industry leading the way, says the annual Schonfeld report.

Page 6

NETMARKETING

Dell targets b-to-... in online sales p...

Dell's Scott Eckert ... business-to-business ... to boost its online ... $2 billion ...

Intel

Continued from Page 1

vate construction project ever attempted. The kicker: Up to 75% of the expense in Intel's ever grander chip factories—or fabs as they're called in the chip business—is for equipment that'll be obsolete for producing state-of-the art chips after only three years. After that, the fab would have to be refitted.

Yet, Mr. Grove keeps putting more chips on the table: Intel is as addicted to growth as PC makers are to "Intel inside" co-op cash.

"If the market ever slows down, they are not going to be able to capitalize on their investment," Mr. Reynolds warns. In such a market, he says, Intel won't get the revenue needed to pay for the products and plants it needs to drive the upgrade market, potentially leading to "a downward spiral."

"Eventually, one day, every country around the world has to be in recession. Is it one year out? Probably not. Is it 10 years out? Maybe. What kind of message can you give the market if nobody's buying anything?"

Don't simply assume Intel will stay on track to become—as stories began extrapolating two years ago—the world's most profitable corporation. Just hope the market keeps on growing. Hope Intel delivers the chips it says it can deliver. And pray that Intel lives by Mr. Grove's mantra: "Only the paranoid survive."

There is no denying what Intel has created to date. The questions to explore: What has marketing contributed to this success and how will it continue?

First engineers, then marketers

Intel became a marketer in 1989 when it changed the primary target of its ads to computer buyers from computer makers, trying to create product demand to fix a pressing problem. Intel that year introduced the 486 chip as the successor to 386. But many PC makers and buyers were content to stay with the aging 286, whose Sunnyvale, Calif.-based Advanced Micro Devices was coming on strong.

So Intel solicited agencies for a project: Move the market to 386. It bought the brash "Red X" campaign from Shafer & Shafer, a little-known Irvine, Calif., tech shop. Oblique but attention-getting print ads and billboards mimicked graffiti by crossing out "286" in red spray paint and inserting "386SX."

In 1990, Intel began a campaign themed "The computer inside" from a newly hired agency of record, Salt Lake City tech shop Dahlin Smith White. The campaign shifted the focus from promoting a product name to building the corporate brand.

One year later, the chip maker launched "Intel inside," paying PC makers to include the logo in ads.

Since then, Intel ad spending has rocketed from the $6 million "Red X" campaign to the $900 million the chip maker will spend this year on co-op and its own ads. But the company has remained true to its brand strategy. Intel again and again has created demand just in time to meet supply of 486, Pentium, Pentium Pro and now Pentium II.

"They stick with a [strategy] over a period of not just years but decades [while] everybody else abandons things," says Heidi Sinclair, managing director of Beverly Hills talent agency International Creative Management and a former executive with Lotus Development Corp. and Borland International. "They create a root campaign and evolve it over time."

The discipline reflects Intel's engineering roots.

"They take a very logical, well-thought-out, well-researched approach to most everything they do," says David Boede, senior VP, group account director at what is now Euro RSCG Dahlin Smith White.

Intel has remained steadfast despite skepticism and criticism over its every advertising step from "Red X" on.

"They're neither technology marketers nor consumer marketers," an ad agency exec in charge of a PC account said privately in 1991. "They have the worst of both."

The president of an ad agency with a major computer client that year, again privately, termed Intel's proposed massive co-op effort "awfully stupid."

"If they spent $1 billion, they're trying to say that a commodity chip is basically different," the agency chief said. "Most people that buy computers don't even know that that chip is in there. They care about the performance of the computer. It really doesn't matter what the chip is."

Oh.

Today, tech ad watchers often dismiss Intel's own ads, such as the disco-dancing fab workers in its 1997 Super Bowl debut, as not up to the creative bar of, say, Ogilvy & Mather Worldwide's work for IBM Corp.

ICM's Ms. Sinclair says some of Intel's advertising is "silly."

Counters Dahlin President John Dahlin: "Ultimately the success of your work is the success of your client. What we do is produce advertising that works great for the problems that our client has. If it doesn't win a lot of awards . . . as long as a billion people buy Pentiums, I can handle that."

Even the "Intel inside" mark, created by Mr. Dahlin's agency, comes up for critique.

"It is a pretty ugly logo," says Connie Birdsall, VP-design director of Lippincott & Margulies, a corporate image consultancy in New York. "The letter forms look like they were cut out of paper and glued together."

But so what? Ms. Birdsall says the logo works by drawing attention in much the way a "New!" screams out on a cereal box.

Jami Dover, Intel director of co-op marketing programs, says Intel and PC makers together have spent $3.4 billion on ads that include the logo. More than $2 billion of that is believed to have come from inside Intel.

This year, Intel will spend $150 million on its own ads—and an estimated $750 million on co-op.

Dennis Carter, VP-sales and marketing and mastermind of Intel branding, says Intel early on concluded it could maximize the return on its advertising by steering money into co-op.

Econ 286

Intel's law of supply and demand, "Intel inside" leads to more advertising by more PC makers in more media, increasing competition, driving down prices and profit margins, leading to greater demand and a bigger market.

"I think all of that's true," says Mr. Carter, with the exception that blaming Intel for slumping PC margins is "too broad of a generalization."

Mr. Carter says Intel intended its money to benefit both PC makers and computer media, betting that proliferation of computer-themed media could only boost the cause of computing.

"Intel and the marketing of the microprocessor I think have had a profound impact positively on the development of the whole worldwide PC industry," Mr. Carter says. "I think the industry would have developed much more slowly" absent Intel's campaign to explain chips and drive demand.

Terri Holbrooke, a veteran tech marketer who now is president of the brand and market group at media power Zill-Davis, credits Intel for "understanding the ecosystem nature of this industry. . . . There's this very circular nature to successful marketing programs in this industry, and the 'Intel inside' program is a great and early example."

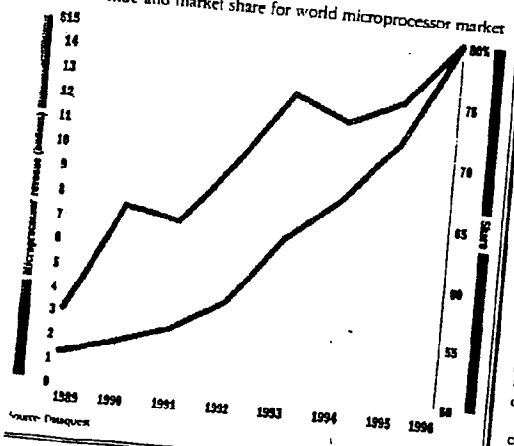
Some 1,500 PC makers from Compaq Computer Corp. down to tiny clone assemblers—now participating can get a 6% rebate on chip purchases in return for putting the logo on PCs and in ads. Of that, 4% can go to print and 2% to TV, radio or in-flight ads.

To get the money, PC makers

Inside Intel

Cashing in the chips

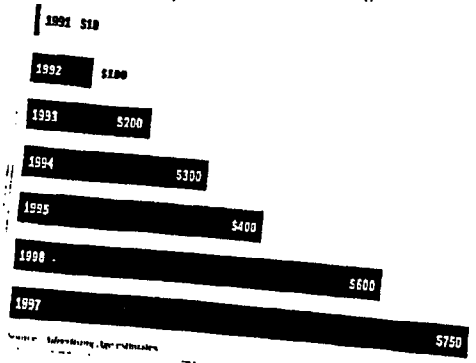
Intel revenue and market share for world microprocessor market



Source: Dataquest

Co-op bonanza

Intel worldwide spending on co-op advertising (millions of dollars)



Source: Advertising Age estimates

Then and now

How Intel and the market have changed since Intel began advertising to PC users in 1989

	1989	1996
Intel revenue	$1.1 billion	$20.8 billion
Intel income	$391 million	$5.2 billion
Intel gross profit margin	48%	56%
Intel stock market valuation	$4.4 billion	$187.5 billion
PCs sold worldwide	20.8 million	76.9 million
U.S. PC print ads, pages	9,896	29,581
U.S. PC print adv. spending	$128.1 million	$369.7 million
U.S. computer TV spending	$111.5 million	$245.5 million
No. of U.S. PC national advertisers	347	678
No. of "Intel inside" PC makers	N/A	1,400

World market share of top 5 PC makers		
Top 5 U.S. PC marketers	40.7%	24.1%
	IBM	Compaq
	Apple	Packard Bell NEC
	Tandy	IBM
	Commodore	Dell
	Compaq	Apple

Source: Intel, Dataquest, Computer Intelligence InfoCorp, Advertising Checkerboard Bureau of Advertising, Competitive Media Reporting

Graphic by Adam Lisa

Intel's creative, *such as this 1997 Super Bowl spot launching the Pentium with MMX, is sometimes criticized.*

Is that enough? [illegible] says there is nervousness among corporate buyers about going outside Intel. Dean McCarron, principal at Mercury Research, a chip market research consultancy in Scottsdale, Ariz., notes how many business buyers write "Pentium" into their purchase specs.

The strength of the Intel brand also is getting tested at the low end of the home market, where Cyrix has snared contracts this year to

to drive in a ne[illegible] Carter says. "Now months."

He gleefully fe[illegible] of holy grails"— tion, video, DV crease demand fo

"What fuels says, "is growth

PC makers hope buyers stay ogy treadmill.

must kick in one third the cost of a print buy and half the bill for broadcast; Intel co-op will pay the rest. There are strings: Stick another logo in the ad, and Intel cuts its payment in half. Little surprise that the number of ads featuring logos of other component makers or of computer magazine awards has plummeted since Intel implemented this rule.

Adding muscle

In an interim program this fall, Intel will let PC makers steer co-op money into Web buys.

Then starting Jan. 1, Intel will divvy up the 6% in a new formula: 2.4% for print, 1.8% for broadcast, 0.6% for Web buys and 1.2% for print, broadcast or Web at the PC maker's discretion. To get the money, PC makers must pay for 60% of a print or broadcast buy and 50% of a Web schedule.

Intel moves markets, and Intel moves media.

In the first half of this year, an "Intel inside" logo appeared in ads accounting for 80% of the $202.9 million spent on PC ads in U.S. computer and business publications, estimates Sheila Craven, president of Adscope, a Eugene, Ore., ad tracking company.

Similarly, computer spending on TV shot up 65%—to $214.3 million—in 1995, the year Intel started subsidizing TV buys, according to the Television Bureau of [illegible] analysis of Competi-

time is right to get in and get started using it."

Is this co-op marketing, or co-opt marketing, with a component maker orchestrating customers' marketing and media decisions?

"The fear is you become so dependent on the extra money that you build plans around it," says a PC industry veteran. The executive recalls how the co-op checks coming in to the company mushroomed from about $50,000 to some $2 million, at which point the finance department ordered the money be sent directly its way.

The executive, who relied on the money to stretch the media buy, didn't take kindly to any thought that "Intel inside" checks be taken straight to the bottom line.

Recalls the executive: "I said, 'I may be a whore, but you guys have turned to pimps, because I work for this money, and you guys are taking it.'"

Any thought to banishing "Intel inside" from all ads? "If I could afford it, I would," the executive says. "But unfortunately it's such a support to the budget I can't really afford to do that."

Two titans—Compaq and IBM Corp.—did quit in 1994. Jim Garrity, then Compaq's director of marketing communications, argued that "Intel inside" detracted from his brand and turned PCs into commodities. But Compaq and Big Blue returned in 1996, meaning every major Intel-based PC maker [illegible] once again on Intel's payroll.

In fact, hundreds of small Intel PC sellers do not participate. What gives?

Some major PC makers buy more chips than they need to get more co-op money, more favorable pricing or a better slot for allocation of new chips. The excess chips are sold into the so-called gray market, many ending up with small mail-order PC assemblers that pay for ads out of their own pocket. Of the 400 to 500 U.S. direct PC sellers, one industry insider estimates half to two-thirds get their Intel chips from a source outside Intel. These small discounters buy a lot of ad pages and help drive competition.

A ubiquitous presence

"Intel inside" once was a hot button of controversy among some PC makers who privately resented Intel's brand intrusion. To be sure, not everyone complained: Intel money largely financed the advertising offensive that turned top-tier direct marketers Dell Computer Corp. and Gateway 2000 into the envy of the industry. Today, "Intel inside" is part of the landscape. It is hard to find an authority who will question Intel's wisdom in making this massive marketing investment.

"There's no doubt that the program has been highly successful," says Tom Stites, VP-communications at rival AMD. Mr. Stites wonders how good a deal it is for PC makers. "It's a bit of a strange market," he says, "when the reason that the money is there is because Intel is raking it out of their hide."

AMD in May be-

Intel's "Red X" campaign *in 1989 was designed to spur demand for its 3 chip by taking its message straight to end users for the first time.*

Richardson, Texas-based Cyrix Corp. typically sell for half the price of a comparable Intel product.

"That's clear indication Intel's branding strategy works," he says.

Incredible recognition

Carter says business and home

supply Compaq and IBM chips for a few models.

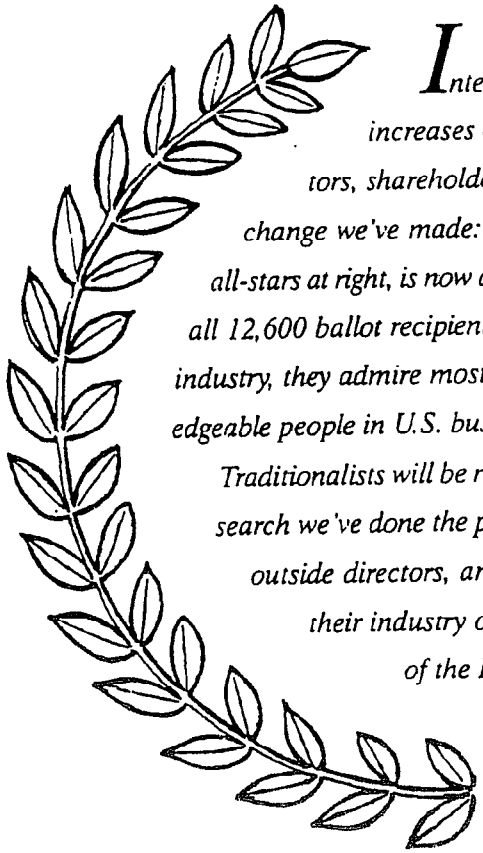
Cyrix agreed in late July acquired by National Semicon tor Corp., Santa Clara, for million. Intel, meanwhile, nounced it will pay $420 for San Jose-based Chips &

Exhibit B-81

Dell on Compaq • The Dow Jones Heiress Speaks Out

FORTUNE

AMERICA'S MOST Admired COMPANIES



Intensity of interest in our Most Admired Companies increases every year, so plenty of executives, directors, investors, shareholder activists, and researchers are sure to focus on a change we've made: Our ranking of the ten most admired, that list of all-stars at right, is now determined in a new way. For the first time, we asked all 12,600 ballot recipients simply to tell us which companies, regardless of industry, they admire most. Since those ballot recipients are the most knowledgeable people in U.S. business, their verdict yields the true A list.

Traditionalists will be relieved to know we perform the same underlying research we've done the past 16 years—every bit of it. We ask top executives, outside directors, and securities analysts to evaluate the companies in their industry on each of eight criteria (see "The Ups and Downs of the Industry Leaders"). In past years we picked out the top scores to create our top-ten ranking. But some industries could have been generally more lavish or stinting with praise than others, so the scores

ILLUSTRATION BY AL HIRSCHFELD

Why Leadership Matters

BY THOMAS A. STEWART

Never fall in love with a stock, investment advisers say. It's wise counsel, but you could be forgiven for ignoring it if the objects of your affection were the stocks of the ten most admired corporations in America. If you'd had the foresight to invest in these ten companies—General Electric, Microsoft, Coke, Intel, Hewlett-Packard, Southwest Airlines, Berkshire Hathaway, Disney, Johnson & Johnson, and Merck—you'd have a thoroughly diversified portfolio. You'd have transportation and financial services and consumer goods and capital goods and health care and information technology and entertainment, among other things. You'd own companies that make sugar water and shoes, sitcoms and spreadsheets, movies, medicines, and microchips, hardware and soft soaps, candy and dental floss. You'd have three companies more than a century old (GE, Coke, J&J) and two upstart startups still run by their founding entrepreneurs (Microsoft, Southwest). You'd have six of the 30 companies in the Dow Jones industrial average, including its oldest (GE) and two of its newest constituents (HP and J&J).

In their variety, America's ten most admired companies resemble the economy. But as they stand above the rest of corporate America in reputation, so do they tower over it in performance. If ten years ago you had bought $10,000 worth of Standard & Poor's 500 and reinvested your dividends, your estimable 17.92% annual rate of return would have compounded into $51,964 today. If you had, however, put $1,000 into each of this year's ten most admired companies, you would be sitting nearly three times prettier, with a portfolio worth $146,419.

Beauty is as beauty does, and what these companies do is gorgeous from almost any angle. In employee relations, for example, Southwest Airlines ranks first on FORTUNE's list of the 100 best companies to work for, and Microsoft, Merck, and Hewlett-Packard are also in the top ten. In market value added—a measure of *might not have been directly comparable. Now that potential problem doesn't arise.*

The value of corporate reputation turns out to be a deep topic. Our survey has been the subject of countless research papers, dozens of corporate tracking studies, and at least one major university symposium. So dive into the pages that follow—or visit fortune.com for more data than they can hold. You'll be in good company. Apparently being admired has never been more valuable.

THE TOP TEN

1 General Electric
2 Microsoft
3 Coca-Cola
4 Intel
5 Hewlett-Packard
6 Southwest Airlines
7 Berkshire Hathaway
8 Disney
9 Johnson & Johnson
10 Merck

how much wealth a company has created for investors—GE, Microsoft, Coke, Intel, and Merck place No. 1 through No. 5. (As the Stern Stewart consulting firm calculates it, MVA is the difference between all the money ever invested in a company and the total current market value of all its securities.) And for sheer wealth, GE, Coca-Cola, and Microsoft rank one-two-three in market capitalization among all U.S. corporations.

What's their secret? It can't be the industries they inhabit, because so many are represented here. But clearly some industries—automaking, chemicals, metals, petroleum refining—don't excite great admiration these days. Others, like tobacco, work against it. The secret can't be the products they make or even their ability to develop new ones. Some of these companies are awesome innovators, but you don't hear much talk about improving the flavor of Coca-Cola (been there, done that ...), and Berkshire Hathaway chief Warren Buffett famously says he wants "simple businesses—if there's lots of technology, we won't understand it."

Top financial performance matters enormously but is not enough to make for a top reputation—necessary but not sufficient, as the phrase says. If you reranked all the public U.S. companies in FORTUNE's survey of corporate reputations by ten-year total return to shareholders, only one of the ten best-regarded—Microsoft—would also be among the ten best-rewarding.

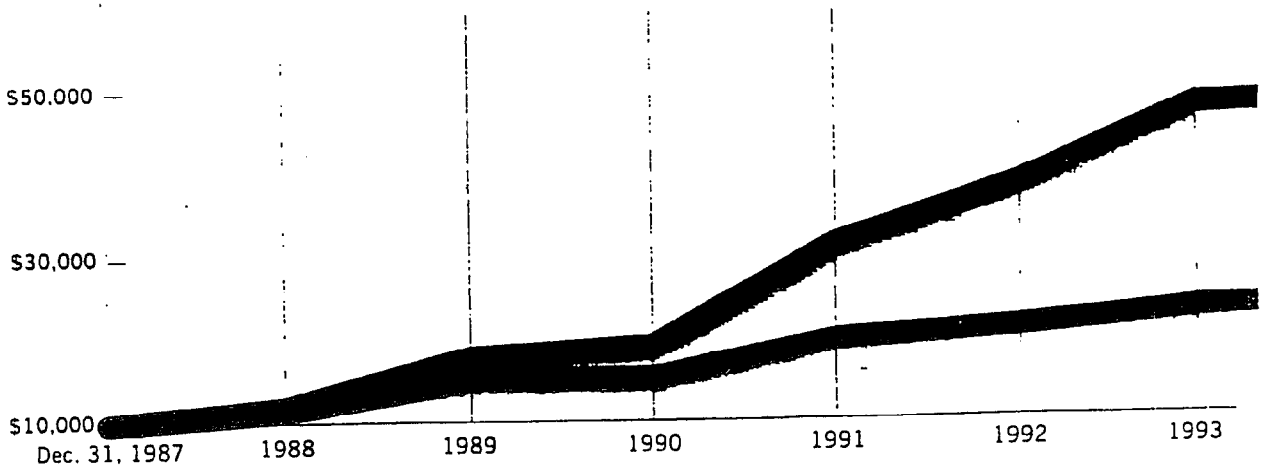
The truth is that no one factor makes a company admirable, but if you were forced to pick the one that makes the most difference, you'd pick leadership. In Buffett's opinion, "People are voting for the artist, not the painting." Berkshire Hathaway, the masterpiece of America's second-richest man, hangs in this gallery alongside two others—Disney and Coca-Cola—in which Berkshire Hathaway has major investments.

Two change metaphors abruptly: These CEOs have more talent than any lineup since the 1927 Yankees. Of Southwest Airlines' boss, FORTUNE asked in 1994, "Is Herb Kelleher America's Best CEO?" If not, it's only because of the other men on this list. It includes the two wealthiest Americans, Buffett and Microsoft CEO Bill Gates, each of whom owes every penny of his fortune to the company he created. Here's Andy Grove of Intel; Grove and Gates are called the Lords of Wintel, but they're really the Lenin and Trotsky of the desktop computer revolution, which humbled IBM, the bluest of all corporate blue bloods. Here's Michael Eisner, the most successful archaeologist since Howard Carter. Carter uncovered the tomb of Tutankhamen; Eisner unearthed and shined up billions of dollars of Walt Disney's buried treasure—and then with new films and new ventures built monuments worth tens of billions more. No longer here is the only CEO who might be Eisner's better at making a great brand greater, the late Roberto Goizueta—whose final and perhaps most remarkable accomplishment at Coca-Cola was that Wall Street never blinked when, at his death in October, he left the company in the deft hands of successor Douglas Ivester. (For portraits of all ten CEOs, see foldout section.)

There is, believe it or not, some academic literature that suggests that leadership doesn't matter. Microeconomists often discount it because it doesn't lend itself to equations. For example, its cost cannot be correlated with its value. The price of a great CEO is no more—and often much less—than the price of a crummy one. The

A PRECIOUS FEW

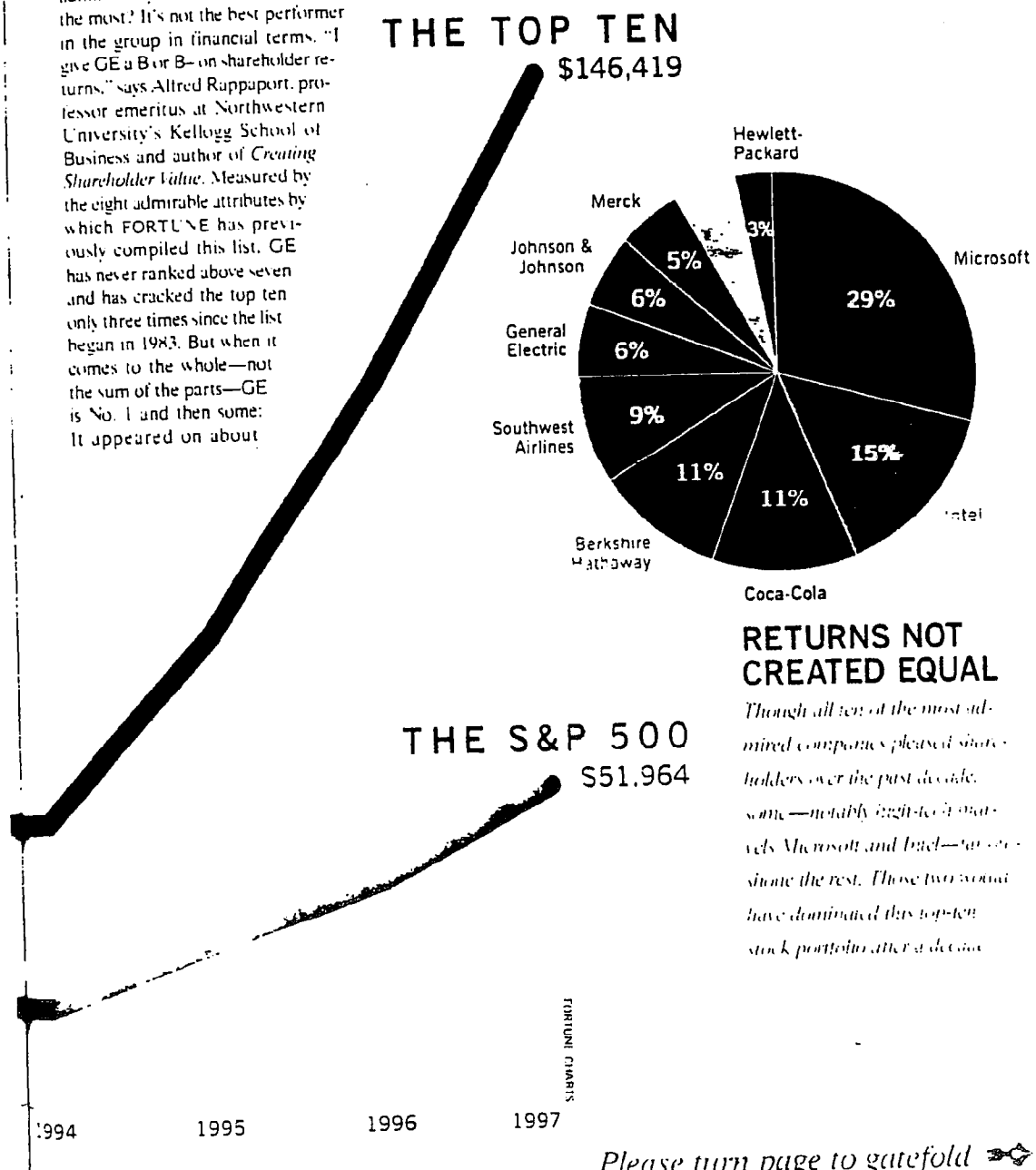
A ten-year, $10,000 investment in our most admired companies, a nicely diversified blend of high-growth service and industrial winners, would have yielded nearly triple the shareholder return of S&P 500 stocks.



services of Warren Buffett go for a measly hundred grand a year (plus a used jet), and he won't take stock options. A leader's output is hard to measure too. But it's there. Lew Platt became CEO of Hewlett-Packard five years ago. During the half-decade before Platt took charge, HP's total return to shareholders was a sleepy 4.6% a year. In the five years since, HP has returned an eye-opening 30.4% a year, compounded. Characteristically, the soft-spoken Platt would say he deserved little of the credit. Uncharacteristically, he would be wrong.

How else—except because leadership matters—can one explain why business people say that of the companies they most admire, they admire General Electric the most? It's not the best performer in the group in financial terms. "I give GE a B or B– on shareholder returns," says Alfred Rappaport, professor emeritus at Northwestern University's Kellogg School of Business and author of *Creating Shareholder Value*. Measured by the eight admirable attributes by which FORTUNE has previously compiled this list, GE has never ranked above seven and has cracked the top ten only three times since the list began in 1983. But when it comes to the whole—not the sum of the parts—GE is No. 1 and then some: It appeared on about 50% more ballots than runner-up Microsoft.

The reason is admiration for Jack Welch, who has rewritten the book on management while keeping GE huge, nimble, and immensely profitable. Welch and GE get credit not only for what they have accomplished during his almost 17 years at the helm but also for what they have avoided. Since 1981 nearly every other corporate behemoth—AT&T, Exxon, Ford, GM, Sears, IBM, Philip Morris, Prudential—has collided with serious trouble: one-time archrival Westinghouse has deconstructed and then morphed into a broadcast outfit. GE has stayed its industrial course and keeps getting



RETURNS NOT CREATED EQUAL

Though all ten of the most admired companies pleased shareholders over the past decade, some—notably eight-to-1 darlings Microsoft and Intel—far outshone the rest. Those two would have dominated this top-ten stock portfolio after a decade

Please turn page to gatefold ➳

THERE ARE

those who say that virtual communities are the next big thing for the future of business. For us, they were the next big thing in 1993.

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MOST ADMIRED

LEWIS PLATT

CEO since 1992

1997 REVENUES: $42.9 BILLION*

Platt, 56, has skippered HP aggressively into the consumer PC market, and the results are impressive: HP has moved from the world's 11th-largest maker of personal computers to No. 3. Now new industries had better watch out. The buttoned-down former mechanical engineer is moving HP into electronic commerce with its $1.3 billion acquisition of VeriFone, which makes those small terminals that process credit- and debit-card transactions. Platt is also targeting the $40 billion photography market with a line of digital cameras, photo scanners, and photo printers.

*Fiscal-year results

BILL GATES

CEO since 1981

1997 REVENUES: $11.3 BILLION*

Detractors have long labeled Gates, 42, a latter-day robber baron—a moniker likely to be heard even more this year as the company targets new markets and the Justice Department's antitrust case against Microsoft heats up. Gates, undaunted, plans to push his software into fresh arenas like online travel services, network systems, and even automobile dashboards. The main reason the company is so admired: In its 12 years of being publicly traded, there's never been a bad time to buy Microsoft. With the stock up 56% last year, how much longer can that hold true?

*Fiscal-year results

DOUGLAS IVESTER

CEO since 1997

1997 REVENUES: $18.9 BILLION

Ivester, a factory foreman's son and former accountant, stepped in smoothly to run Coca-Cola as CEO last autumn following the death of champion wealth creator Roberto Goizueta. Early in his tenure as Coke's chief, Goizueta had recognized Ivester's drive, commenting that he was the hardest-working man he had ever met. Together the two revamped the company's operations and capital structure to maximize shareholder value about as aggressively as any company has. It is a crusade that Ivester, 50, will likely carry on.

JACK WE

CEO since

1997 REVENUES: $

As Welch, 62, closes in on uled for 2001, he s at the to may be only the third-mo pany on planet Earth—at Shell and Exxon—but it is with a market capitalization lion, and it is America's gre tor, leaping past Coca-Co latest ranking by market va The stock rose almost 50 the same as Microsoft's— times bigger and 10th years tion to raise the retirement

ANDY GF

CEO since

1997 REVENUES: $

If anyone deserves to rest Grove, 61, who led the chi red-hot year: a 20% increa a 33% jump in profits. Gr gineer helped found Intel 1997 Man of the Year, bu busy 1998. The chip indus that prices drop like a sto chasm, so Grove must pe markets. He has unveiled a the Pentium II for everyth ered servers to discount h boxes that connect TVs to

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CEO

1997 REVENU

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TUNE's recent list
Companies to Work

MICHAE

CEO

1997 REVENUE

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RB KELLEHER

CEO since 1982

EVENUES: $3.8 BILLION

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the airline industry: In two short
master of the short-hop cheapo
captured a good chunk of the Flor-
and greatly expanded Southwest's
with longer hauls. The airline's fa-
tisfied work force seems happier
Southwest ranked No. 1 in FOR-
ecent list of America's 100 Best
s to Work For.

RALPH LARSEN

CEO since 1989

1997 REVENUES: $22.6 BILLION

Nearly half of J&J's sales come from foreign markets, so the strong dollar has made earnings gains tougher to achieve for the health-care and consumer-products giant. Nevertheless, Larsen, 59, a reserved Brooklynite who joined J&J in 1962, has cut costs, introduced innovative new products, and driven sales so hard that the company still managed to post a 14% profit increase last year. J&J's pharmaceuticals business led the way, buoyed by strong sales of an antipsychotic drug, an anemia-treatment product, and a patch for managing chronic pain.

RAYMOND GILMARTIN

CEO since 1994

1997 REVENUES: $23.6 BILLION

When Merck's directors tapped Gilmartin, 56, as CEO four years ago, they gave him a crucial mission: Create a new generation of blockbuster drugs to replace important products whose patents were soon to expire. Gilmartin has delivered. A treatment drug for AIDS and another for osteoporosis have hit the market since 1995; a promising male baldness drug was recently released. In this rapidly consolidating industry, the Street thinks Merck is a winner. The stock has soared more than 33% in the past year.

WARREN BUFFETT

BERKSHIRE HATHAWAY

CEO since 1970

1997 REVENUES: $9.2 BILLION*

Can he pick 'em? Five companies in which Buffett's investment company holds large stakes lead their respective industry groups in this year's Most Admired survey: Coca-Cola, Gillette, American Express, Disney, and McDonald's. He's on Coke's and Gillette's boards. Buffett, 67, added the Dairy Queen fast-food chain and a furniture maker to Berkshire's portfolio last year, but don't expect to see them start moving up their own lists under the master investor's magical influence anytime soon. The companies are too small to make it into the rankings—for now.

*Results of last four quarters

HAEL EISNER

CEO since 1984

:VENUES: $22.5 BILLION*

posse came gunning for the 55-
ad Mousketeer last year: Big Dis-
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amax looks golden. Investors wor-
he stock took off (again) last fall.

esults

1 BILL GATES
2 JACK WELCH
3 HERB KELLEHER
4 RALPH LARSEN
5 LEWIS PLATT
6 DOUGLAS IVESTER
7 ANDY GROVE
8 MICHAEL EISNER
9 RAYMOND GILMARTIN
10 WARREN BUFFETT

better. Says Buffett, "People admire Jack for what he has done at GE more than they would if he had been at IBM and merely maintained it at the top. Before Jack, we thought GE was big and good, but not big and great."

What makes GE great? "Leadership," says Gertrude G. Michelson, who joined GE's board of directors in 1976, five years before Welch became CEO: "I've served on a number of boards, but GE is singular not only in its top leadership but in the institutional development of leadership. That's the outstanding attribute of the company, and it's largely a result of Jack's vision." Under Welch, GE spends upwards of $800 million a year on training and leadership development —about half what it spends on R&D. It's focused on spreading the word about Welch's vision, which Michelson describes as almost religious in its fervor: "how to anticipate change, how to cope with change, how to change . . . a big company that does many things well."

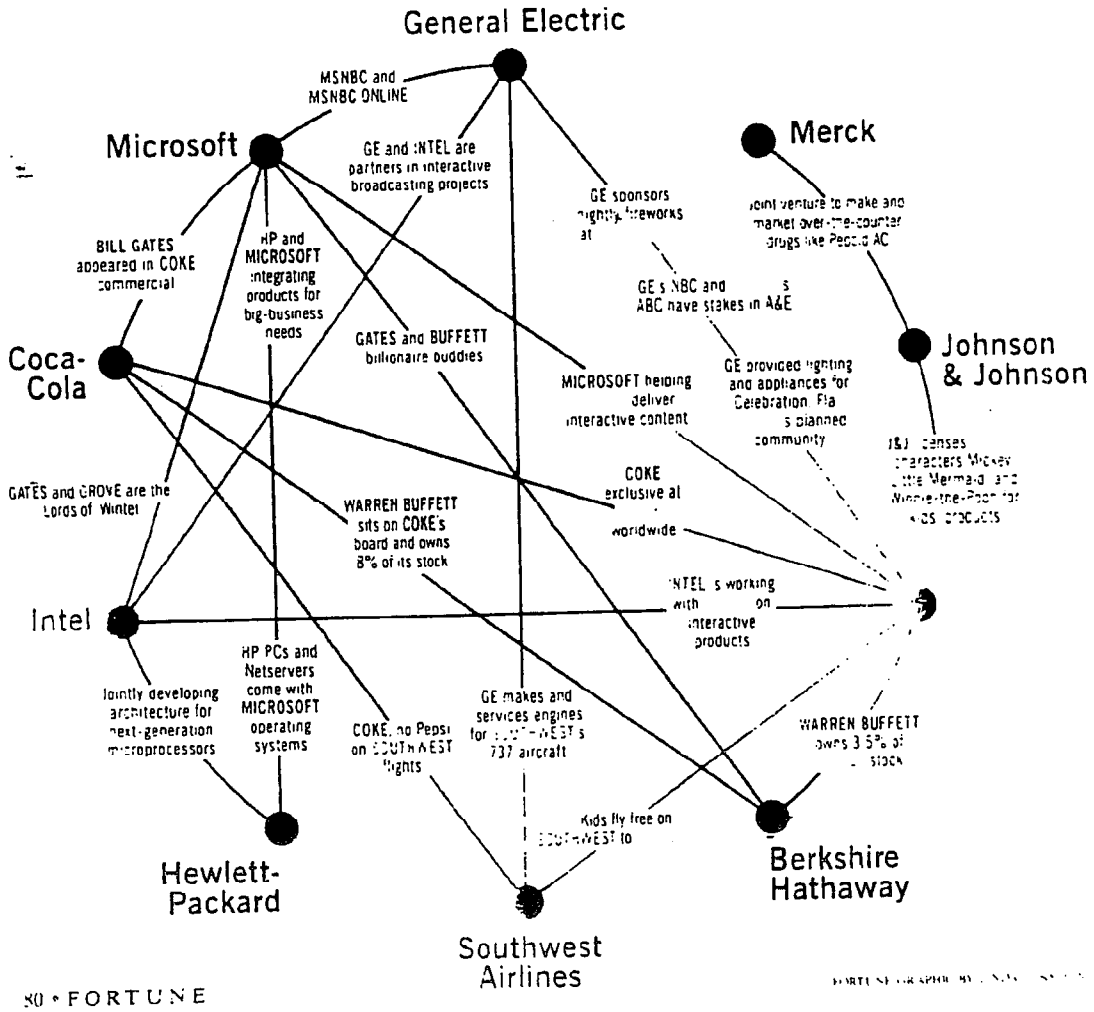
Welch may top this list of ten leaders, but he doesn't typify it. Nothing does—and therein hangs an important point. Every conceivable leadership style is represented by these CEOs. Welch is combative, tilts his head, and thrusts out his chin as if to say, "Go ahead, take your best shot"—and is never happier than when you do. Kelleher's a prankster and a kisser so unabashedly affectionate that his company's ticker symbol is LUV, so hands-on he has loaded baggage and served peanuts to passengers. So says, "I'm a nut about financials." Ivester—well, "hands-on demonstrative" understates one aspect of the man, and "financial wizard" understates another.

Gates is said to be seething about statements he considers

REPORTER ASSOCIATES *Ann Harrington and Maura Gerrin Schwar*

MUTUAL ADMIRATION SOCIETY

It's a small world at the top, and the links among the most admired are intricate. Microsoft and Intel are partners. Disney has the most connections. Merck . . . Berkshire Hathaway is a major investor in Coca-Cola . . .



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ers stupid. Ralph Larsen of Johnson & Johnson says: "I try to encourage, to give people a sense of self-worth and self-esteem, to instill confidence. I don't want people doing what I say; I want them to sort it out for themselves." Welch sent Buffett a note that began "This is probably below your radar screen" when Berkshire Hathaway's jewelry subsidiary was considering taking its credit card business away from GE Capital. Buffett, for his part, says he and vice chairman Charlie Munger "delegate almost to the point of abdication."

Says Larsen: "Leadership to me is all a question of substance, not style." That remark gets an "A" from Harvard Business School professor John Kotter, who has spent decades studying executive leadership. Says Kotter: "At the level of style, you find great variation among great leaders, but beneath style—in the content of leadership—are uniformities that fit all of them." Kotter lists three, but we can add two more, and offer Five Things Leaders Must Do.

The first, says Kotter, is "help a group establish some sensible direction." The *mot du jour* for this is vision. But it's not vision in the Mosaic sense: a view from the mountain, with the promised land of milk and honey so clear you can practically see the worker bees pollinating happily away. Says Buffett: "Vision is too fancy, but they have a dream and"—this is the key, subtle part—"the dream isn't fleshed out, which is why they are never satisfied." Welch is on his fourth major campaign at GE—there were "Gotta be No. 1 or No. 2," then "Speed, Simplicity, and Self-Confidence," then "Boundarylessness," now "Six Sigma." Yet according to Buffett, "Jack feels there's more to do at GE than when he started." Welch himself once said, with a tinge of scorn, "Some CEOs think the day they become CEO is the high point of their careers. They ought to feel they're just beginning."

Great business leaders ought to reveal all the traits of a great lover—passion, commitment, ferocity. Nothing less will do.

Second, says Kotter, "great leaders are all good at getting relevant partners aligned with, buying into, believing in" the direction they have set. Says Larsen: "You can only push and shove so far. It isn't leadership till you somehow touch people in a way that makes them want to contribute the maximum." True, CEOs like Gates, Grove, and Welch can be conspicuously hard-driving. But, says Kotter—this is another subtle bit—"they may *drive* people toward results, but they *align* them with broader ideas of what the company should be and why." They're tireless talkers, whether it's through speeches or confabs or chats or prose. (Buffett, Welch, and Grove are among the best business writers in America.) Says Kotter: "Lew Platt isn't a loud, extroverted guy, but he is constantly clarifying where we're taking this thing, and in his own quiet, blushing way getting his colleagues not only to understand but to agree it's right."

Kotter's third constant of leadership content: "The ability to create conditions that energize and inspire people to get off their fannies." Herb Kelleher is easily the noisiest of this warren of Energizer Bunnies, but there's nothing random about the racket. His every beat of drum and crash of cymbal emphasizes his design for Southwest, which is to make flying cheap, fast, and fun—a formula that works so well that during Southwest's first three months flying from Baltimore to Cleveland, total traffic on the route rose 4,620% above the same period the year before.

"Atmospherics have a disproportionate weight in my mind," he says, appropriately for an airline CEO. "We pay just as good wages and benefits as other airlines, but our costs are lower because our productivity is higher, which is achieved through the dedicated energy of our people. It's sheer willpower—no mechanical tricks." Southwest can empty and refill a plane in 20 minutes; most airlines need an hour. "We've got exactly the same equipment," the CEO says. "The difference is, when a plane pulls into a gate, our people *run* to meet it. Ponce de Leon was looking for the Fountain of Youth in the wrong place—he should have come to Southwest Airlines."

To these three pieces of the content of leadership, add a fourth, especially for captains of industry: a knack for allocating capital. Everyone knows that's the CEO's job and it's important, but a little math, courtesy of the Old Master of Omaha, helps show how important. Say a company earns a 20% return on equity—as these routinely do—and pays back 5% a year to shareholders, reinvesting 15%. Compound that 15% for five years: The CEO has allocated more equity capital than the company had when he started. Says David Nadler, head of the Delta Consulting Group and a confidant of such leaders as Xerox's Paul Allaire and Lucent's Henry Schacht: "It's not just returns that matter; it's what you do with the returns."

Allocating capital is equal parts discipline and art. Alfred Rappaport, an expert on the discipline, admires the art: "The best CEOs I have seen are extremely good at some 'soft' things. They know how to motivate the system. They ask the right questions about execution. And they have an economic model that makes sense, that they understand, which they use as a navigational tool. They don't have a whole bunch of measures."

The economic model—like the vision—isn't overly detailed. Asks Rappaport: "What good is a wonderful project if it's embedded in a lousy strategy?" Whether the capital investment is in brick and mortar or—as it is increasingly—in ideas, once the strategic allocation is right, the rest gets a lot easier. G.G. Michelson saw that close up at General Electric. She recalls: "Jack's first move was to say every business had to be No. 1 or No. 2 in its industry. When you start with that and lop off the threes and fours, you've already made the most important decisions about how you're going to grow the company."

There's one more item on our list of Things Leaders Must Do, and it's just what your broker says Investors Must Not Do: fall in love. There are CEOs who slash and CEOs who fix and CEOs who safeguard and CEOs who build. The great ones do all these things too, but first of all they love. Passion, commitment, ferocity—the traits of lovers are in these leaders. Says Buffett the investor: "Find the leader who loves his business—who's not measuring himself by whether he got into Augusta or goes to Davos." Says Buffett the CEO: "I could play golf like Tiger Woods, but if Berkshire were not doing well, I'd not be happy." In 17 years, says Michelson, "Never have I seen Jack Welch bored or tired—never. He thinks he's the luckiest man alive." Which goes double ditto for Kelleher: "I love it, I love it—I sure as heck do." ■

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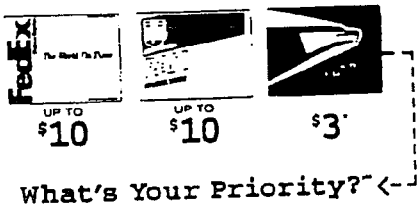

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MOST ADMIRED

The Ups and Downs of the INDUSTRY LEADERS

It was a year of thrills and agony in the industry rankings: Chrysler got a shock, Continental Airlines soared, Kodak slumped, and Columbia/HCA dropped very far, very fast.

BY EDWARD A. ROBINSON

Battles for industry leadership have often been ferocious in the 16-year history of our Most Admired survey. Merck and Johnson & Johnson dueled for top honors in pharmaceuticals in the early 1980s, and in the early '90s, IBM, Hewlett-Packard, and—believe it or not—Apple wrestled for the crown in computers. Ford and Chrysler have more recently vied for the top spot in autos. But four industry groups have experienced no churn whatsoever: aerospace, commercial banking, life insurance, and forest products. Boeing, J.P. Morgan, Northwestern Mutual Life, and Kimberly-Clark have dominated their respective categories since this survey's beginning. As the world struggles through economic turmoil and competitive chaos, it may be comforting to know that this year is no different: All four retain their titles.

The battles in this year's survey rage elsewhere. A reinvigorated Chrysler had finally claimed victory from Ford in last year's ranking, but now, just a year later, two foreign subsidiaries have dropped Chrysler to No. 3. German rival Daimler-Benz North America moved from No. 7 to No. 2 in the category, while Toyota Motor Sales U.S.A., the California-based marketing arm of the Japanese automaker's U.S. operations, debuted in the listings this year and placed first.

Toyota U.S.A.'s showing testifies to the respect its parent, Toyota Motor, enjoys worldwide among its peers, many of which have copied Toyota's lean production style in their own assembly plants. (Toyota Motor placed first in motor vehicles in our global Most Admired rankings last year.) But the U.S. marketing operation deserves credit too. The Camry, Toyota's sedan assembled in Georgetown, Ky., outpaced Ford's Taurus and Honda's Accord to become America's best-selling car last year, thanks in large part to Toyota U.S.A.'s aggressive pricing strategy and an understated but apparently effective advertising campaign. Says Yale Gieszl, Toyota U.S.A.'s executive vice president: "Toyota has invested billions in R&D and production in the U.S., enabling us to match our American-built cars to American tastes with great success."

As for homegrown companies on the move, Continental Airlines and Yellow Corp., a Kansas-based trucking outfit, each zoomed up the rankings at the expense of rivals. Continental, set on a customer-friendly path by CEO Gordon Bethune three years

REPORTER ASSOCIATES *Ann Harrington, Jay Albany*

EIGHT KEY ATTRIBUTES OF

Microsoft broke a pair of survey records with the highest scores ever in two categories: ability to

INNOVATIVENESS

MOST ADMIRED	SCORE
Enron	8.93
Intel	8.66
Nike	8.54
LEAST ADMIRED	**SCORE**
Flagstar	3.48
Standard Commercial	3.84
Woolworth	3.90

QUALITY OF MANAGEMENT

MOST ADMIRED	SCORE
Coca-Cola	9.22
Intel	9.21
General Electric	8.99
LEAST ADMIRED	**SCORE**
Apple Computer	2.43
Outboard Marine	3.55
Flagstar	3.91

EMPLOYEE TALENT

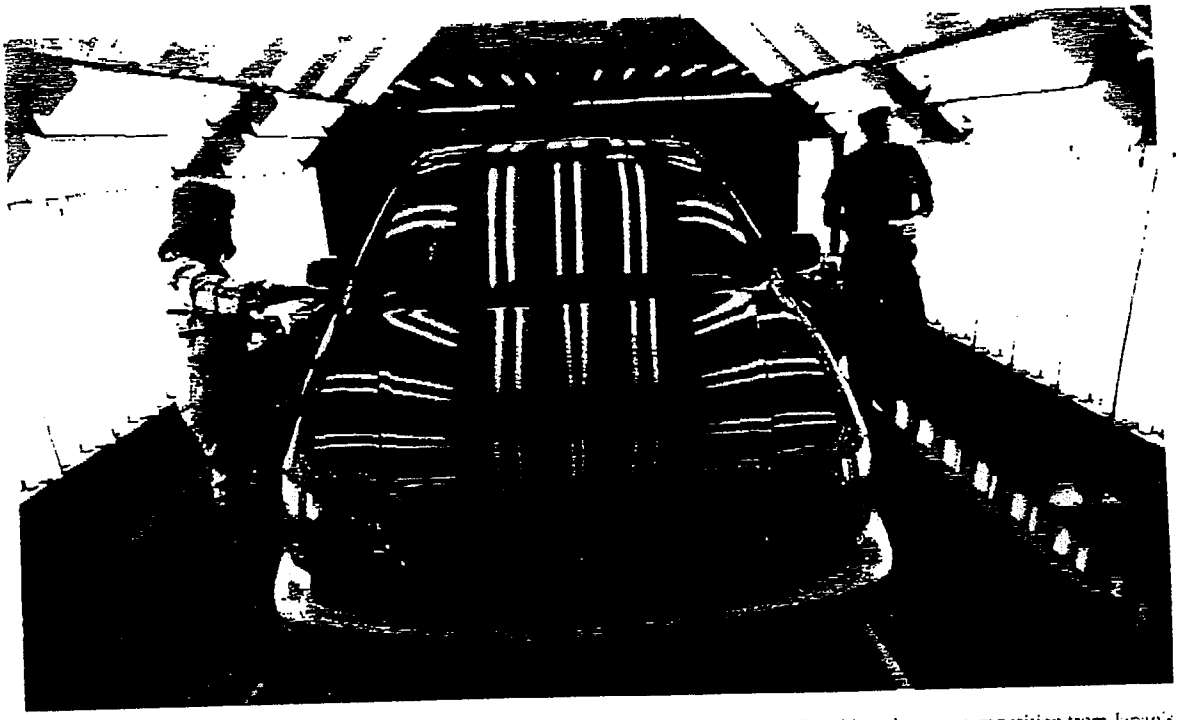
MOST ADMIRED	SCORE
Microsoft	9.16
J.P. Morgan	8.75
Intel	8.67
LEAST ADMIRED	**SCORE**
TWA	2.89
Apple Computer	3.07
Flagstar	3.13

QUALITY OF PRODUCTS/SERVICES

MOST ADMIRED	SCORE
Toyota Motor Sales U.S.A.	9.02
Coca-Cola	8.91
Gillette	8.90
LEAST ADMIRED	**SCORE**
Flagstar	4.12
Standard Commercial	4.18
Dimon	4.63

LONG-TERM INVESTMENT VALUE

MOST ADMIRED	SCORE
Cisco Systems	9.23
Intel	8.99
Microsoft	8.97
LEAST ADMIRED	**SCORE**
Apple Computer	2.16
Flagstar	2.88
TWA	2.96



ago, scored high enough to hit No. 3 in airlines, and along the way it has raised its overall marks more than any other company during the 1990s. The year's biggest gainer, however, is Yellow. The trucker posted a 31% jump in its score, moving from No. 8 to No. 3, thanks to a robust 18-month turnaround driven by CEO Maurice Myers. "I arrived at Yellow in 1996 and saw a culture that could best be described as shackled by regulation," Myers says. "The problem was that the business has been deregulated since 1980." Myers reenergized the company by slashing costs by $145 million, encouraging on-the-ground dialogues between executives and customers, and installing a pay-for-performance plan for his non-union employees. As a result, Yellow posted $52 million in net income for 1997, compared with a $27 million loss the year before.

Moving in the opposite direction, companies like Eastman Kodak and Freeport-McMoRan Copper & Gold have skidded toward the cellar after shaky performances. Kodak fell to No. 7 from No. 3 in the scientific, photo, and control equipment group, a reversal of fortune largely attributable to intense competition from Japan's Fuji Photo Film and a drop in the company's stock price from a $94 high last February to $60 in December. CEO George Fisher recently unveiled a restructuring plan designed to slash more than $1 billion in costs by 1999, but analysts remain wary. "This has to be a year of meaningful improvement in earnings," says Merrill Lynch analyst Robert Curran, "but with the dollar remaining so strong, Fuji will continue to be very competitive."

Meanwhile, Freeport-McMoRan Copper & Gold had the misfortune of partnering with Bre-X, the Canadian mining outfit that falsely told the world it had found the planet's largest gold deposit in an Indonesian jungle. Freeport actually blew the whistle on Bre-X after its tests proved the find was bogus, but that couldn't stop the New Orleans–based company from slipping from No. 2 to No. 6 in mining and crude oil.

WINNERS

These companies have led their industry every year.

Boeing
Aerospace

J.P. Morgan
Commercial banking

Northwestern Mutual
Life insurance

Kimberly-Clark
Forest products

Then there's Columbia HCA, in a class by itself. The Nashville-based health-care concern has won the ignominious honor of being the only company in the history of the Most Admired survey to go from being No. 1 in its category to occupying last place, No. 10, in just one year. Last year the feds won indictments against executives on charges of Medicare fraud, and Columbia HCA's score nosedived 33%, the worst plunge of any company.

There's always hope, of course, even for big losers like Columbia HCA. The tools used by new stars like Continental or Yellow to rebuild their corporate reputations are hardly mysterious. They improved efficiency, revitalized customer relationships, and made better use of capital. And when they did, the rival executives, analysts, and other experts who vote for these industry rankings couldn't help but notice.

REPUTATION

...intact talented people and financial soundness.

FINANCIAL SOUNDNESS

MOST ADMIRED	SCORE
Microsoft	9.86
Intel	9.69
Cisco Systems	9.35
LEAST ADMIRED	**SCORE**
TWA	2.17
Apple Computer	2.37
Flagstar	2.65

SOCIAL RESPONSIBILITY

MOST ADMIRED	SCORE
Herman Miller	8.32
Coca-Cola	8.19
Du Pont	8.06
LEAST ADMIRED	**SCORE**
Columbia/HCA Healthcare	3.65
Flagstar	3.67
Great Western Financial	3.73

USE OF CORPORATE ASSETS

MOST ADMIRED	SCORE
Coca-Cola	8.79
Intel	8.54
Berkshire Hathaway	8.48
LEAST ADMIRED	**SCORE**
Apple Computer	2.63
Flagstar	3.14
Advanta	3.41

COMPANIES Rank in their own INDUSTRIES

The floor of the New York Stock Exchange rocked, with markets more volatile than ever.

MONEY, MONEY, MONEY

Chaos in Asia and consolidation at home tested nearly every player in finance. Few made dramatic changes in rank. Big exception: AmEx jumped to No. 1 in consumer credit.

MONEY CENTER BANKS[1]

1997	1996	COMPANY	SCORE
1	1	J.P. Morgan	8.16
2	2	Citicorp	7.55
3	6	Chase Manhattan	7.22
4	9	Bankers Trust New York	6.62
5	3	First Chicago NBD	6.61
6	•	Bank of New York	6.60
7	•	Republic New York	6.40

SAVINGS INSTITUTIONS

1997	1996	COMPANY	SCORE
1	2	Golden West Financial	7.04
2	4	Charter One Financial	6.69
3	1	Washington Mutual	6.55
4	5	H.F. Ahmanson	6.05
5	3	Standard Federal Bancorp.[2]	5.54
6	•	Dime Bancorp	5.36
7	-	Glendale Federal Bank[3]	5.21
8	•	California Federal Bank	4.99
9	•	Greenpoint Financial	4.91
10	6	Great Western Financial[4]	4.34

SECURITIES[5]

1997	1996	COMPANY	SCORE
1	1	Merrill Lynch	8.13
2	2	Morgan Stanley Group[6]	7.59
3	3	Charles Schwab	7.07
4	5	A.G. Edwards	6.48
5	•	Alex. Brown[7]	6.38
6	•	Franklin Resources	6.36
7	4	Bear Stearns	6.34
8	6	Salomon	5.71
9	8	Lehman Brothers Holdings	5.68
10	7	Paine Webber Group	5.09

INSURANCE: LIFE, HEALTH

1997	1996	COMPANY	SCORE
1	1	Northwestern Mutual Life Ins.	7.49
2	3	Principal Financial Group	6.77
3	2	New York Life Insurance	6.62
4	4	TIAA	6.46
5	•	Massachusetts Mutual Life Ins.	6.45
6	6	Metropolitan Life Insurance	6.16
7	•	John Hancock Mutual Life Ins.	6.10
8	2	Cigna	6.00
9	9	Aetna	5.61
10	10	Prudential Insurance of America	4.91

INSURANCE: PROP., CASUALTY

1997	1996	COMPANY	SCORE
1	[illegible]	Berkshire Hathaway	7.79
2	1	USAA	7.31
3	2	American International Group	7.30
4	3	General Re	7.08
5	5	State Farm Insurance	7.03
6	6	Allstate	6.99
7	7	Travelers Group	6.78
8	8	Hartford Fin. Services Group[8]	6.54
9	7	Nationwide Insurance Enterprise	6.37
10	10	Liberty Mutual Insurance Group	5.95
11	9	Loews	5.36

SUPERREGIONAL BANKS[1]

1997	1996	COMPANY	SCORE
1	•	Norwest	7.52
2	7	First Union	7.19
3	3	BankAmerica	7.10
4	4	NationsBank	7.08
5	5	Banc One	7.07
6	•	BankBoston	6.55
7	10	Fleet Financial Group	6.54
8	•	Wells Fargo	6.35
9	•	PNC Bank	6.23
10	•	KeyCorp	6.21

CONSUMER CREDIT[11]

1997	1996	COMPANY	SCORE
1	6	American Express	7.56
2	•	MBNA	7.42
3	•	First USA[12]	6.66
4	•	Capital One Financial	6.26
5	4	Household International	6.20
6	7	Dean Witter Discover[13]	6.01
7	•	Beneficial	5.41
8	•	Advanta	4.04

[illegible]

ON THE MOVE

Thanks to a 32% increase in profits for the year, Cummins Engine steams to No. 3 in industrial equipment, while Continental and Yellow move up in their groups.

AEROSPACE

1997	1996	COMPANY	SCORE
1	1	Boeing	7.83
2	3	AlliedSignal	7.38
3	2	Lockheed Martin	7 29
4	4	United Technologies	7 02
5	5	Textron	5.81
6	[illegible]	General Dynamics	6.60
7	9	Sundstrand	6 38
8	8	B.F. Goodrich	6.36
9	10	Northrop Grumman	6.32
10	6	McDonnell Douglas[1]	6.04

AIRLINES

1997	1996	COMPANY	SCORE
1	1	Southwest Airlines	7.14
2	2	AMR	7.07
3	6	Continental Airlines	6.41
4	3	UAL	6.26
5	4	Northwest Airlines	6.11
6	[illegible]	Alaska Air Group	5 86
7	5	Delta Air Lines	5.54
8	9	US Airways Group	5.21
9	8	America West Holdings	4.64
10	10	TWA	3.54

MAIL, PKG. & FREIGHT DELIVERY

1997	1996	COMPANY	SCORE
1	1	United Parcel Service	8 00
2	2	Federal Express	7.33
3	4	Airborne Freight	6.08
4	3	Air Express International	6.07
5	5	Pittston	5.55

INDUSTRIAL & FARM EQUIPMENT

1997	1996	COMPANY	SCORE
1	1	Caterpillar	7 65
2	2	Deere	7.34
3	7	Cummins Engine	6.52
4	4	Ingersoll-Rand	6.43
5	5	Dover	6.34
6	3	Parker Hannifin	6.28
7	6	Black & Decker	6.20
8	9	Case	6.01
9	10	Dresser Industries	5.95
10	8	American Standard	5.93

TRUCKING

1997	1996	COMPANY	SCORE
1	1	Ryder System	6.53
2	6	CNF Transportation[2]	6.20
3	8	Yellow	6.03
4	2	Roadway Express	5.55
5	5	J.B. Hunt Transport Services	5.39
6	7	Caliber System[3]	5.37
7	3	USFreightways	5.34
8	•	Consolidated Freightways	5 04
9	9	Arkansas Best	4.61
10	10	Amerco	4.30

MOTOR VEHICLES & PARTS

1997	1996	COMPANY	SCORE
1	•	Toyota Motor Sales U.S.A.	7.56
2	7	Daimler-Benz N.A.	7.24
3	1	Chrysler	7.18
4	2	American Honda Motor	6.98
5	4	Ford Motor	6.85
6	3	Johnson Controls	6.72
7	5	TRW	6.63
8	3	Tenneco	6.29
9	10	General Motors	6.28
10	9	ITT Industries	6.07

RAILROADS

1997	1996	COMPANY	SCORE
1	1	Norfolk Southern	[illegible]
2	4	Burlington Northern Santa Fe	[illegible]
3	3	CSX	[illegible]
4	2	Union Pacific	[illegible]
5	5	Conrail[4]	[illegible]

SHOP TILL YOU DROP

Swoosh! Nike, formerly of the [illegible] group, moved into apparel and promptly took No. 1, heading off Liz Claiborne's recent march toward the top.

APPAREL

1997	1996	COMPANY	SCORE
1	•	Nike	[illegible]
2	2	Liz Claiborne	[illegible]
3	3	VF	[illegible]
4	•	Jones Apparel Group	[illegible]
5	•	Reebok International	[illegible]
6	4	Russell	[illegible]
7	6	Kellwood	5 89
8	5	Warnaco Group	5 37
9	7	Fruit of the Loom	4 85

WHOLESALERS

1997	1996	COMPANY	SCORE
1	1	Cardinal Health	[illegible]
2	•	Ingram Micro	[illegible]
3	2	Sysco	[illegible]
4	4	McKesson	[illegible]
5	6	Arrow Electronics	[illegible]
6	5	Genuine Parts	[illegible]
7	7	Bergen Brunswig	[illegible]
8	8	Supervalu	[illegible]
9	3	Ikon Office Solutions[5]	[illegible]
10	9	Fleming	[illegible]

FURNITURE

1997	1996	COMPANY	SCORE
1	1	Herman Miller	[illegible]
2	2	Leggett & Platt	[illegible]
3	3	HON Industries	[illegible]
4	5	Furniture Brands International	[illegible]

[illegible] ... Boeing Aug. ... 1997. Name changed from Consolidated Freightways ... Express Jan. 27, 1998. Acquired by Norfolk Southern and CSX June 2, 1997. Name changed ...

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Prudential Equity Income Fund

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Availability: This fund is available through Prudential Securities Financial Advisors and Pruco Securities Registered Representatives.

Other important information: Also available for IRA contribution.

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Prudential Equity Income Fund (Class A)

Average Annual Total Returns (including sales charge) ended 12/31/97

1 year	5 year	Since Inception 1/22/90
[illegible]	[illegible]	[illegible]

Past performance is no guarantee of future results. Performance and rankings for other classes of shares vary due to differences in sales charges and expenses. Share price and return will fluctuate so that you will have a gain or loss when you sell shares. Class A share return as shown above includes a 5% front-end sales load. Prior to 8/1/94, sales load was 5.25% which would have reduced the performance quoted.

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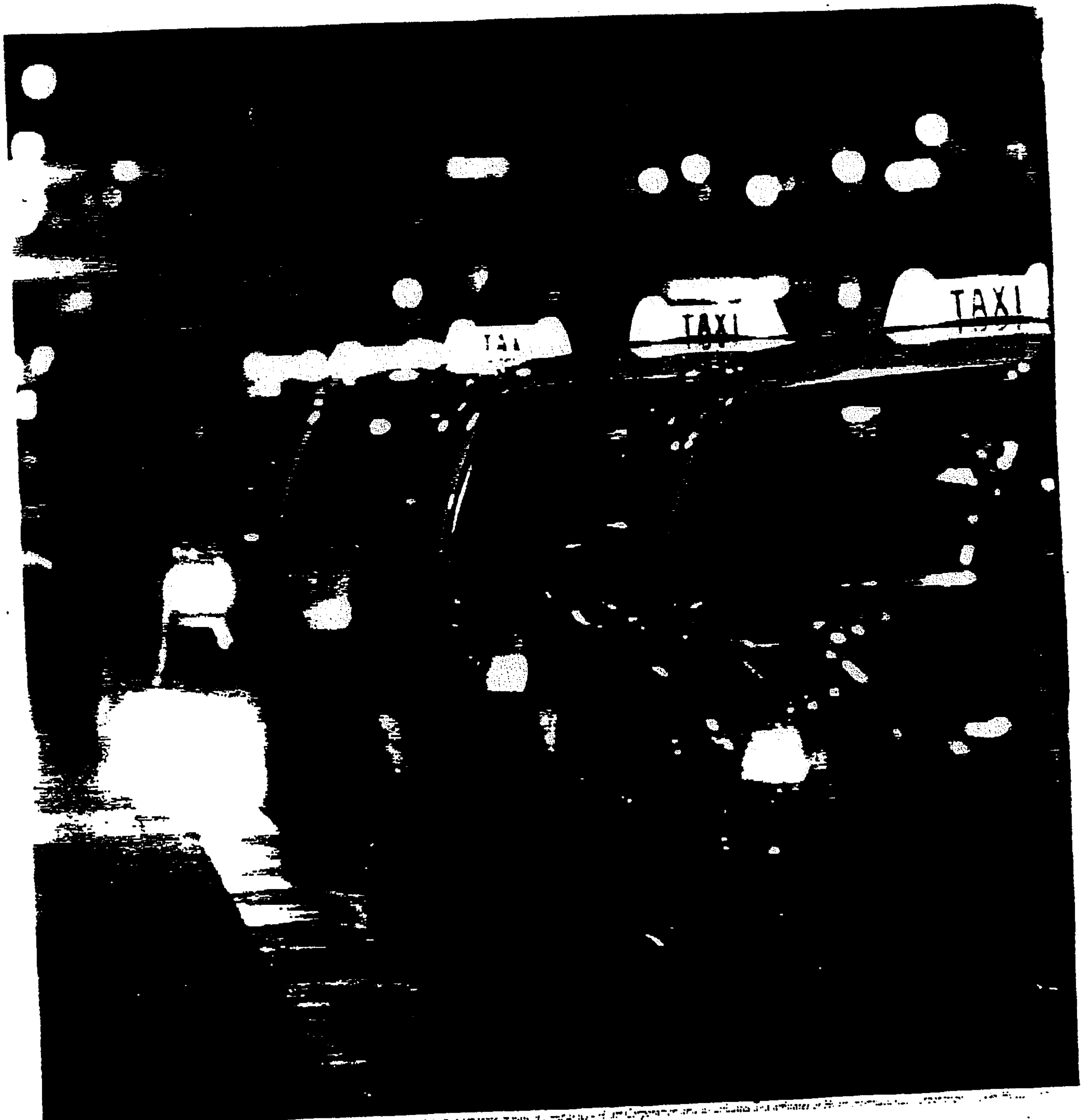
Prudential Investments

The Prudential Equity Income Fund (Class A) has a standard deviation of 14.11 and 12.35 for the 3-year and 5-year periods ended 12/31/97 respectively. The standard deviation for the average domestic equity fund is 14.41 (out of 2,332 funds) and 13.01 (out of 1,292 funds) for the 3-year and 5-year periods ended 12/31/97, respectively. (Source: Morningstar Principia.) Standard deviation is an absolute (non-relative) measure of volatility which, for a mutual fund, depicts how widely the returns varied over a certain period of time. Although past performance is no indication of future results, when a fund has a high standard deviation, its range of performance has been very wide, implying greater volatility potential. Standard deviation is only one of several measures of a fund's volatility. The Fund may invest in foreign securities, which are subject to the risks of currency fluctuation and the impact of social, political and economic change. The Fund may also invest in high yield or "junk bonds" which are subject to greater credit and market risks. Investing in foreign securities or high yield securities may result in greater share price volatility. Shares of the Fund are offered through Prudential Securities Incorporated, 199 Water Street, New York, NY, and Pruco Securities Corporation, 213 Washington Street, Newark, NJ, both subsidiaries of The Prudential Insurance Company of America.

—When did every place start to



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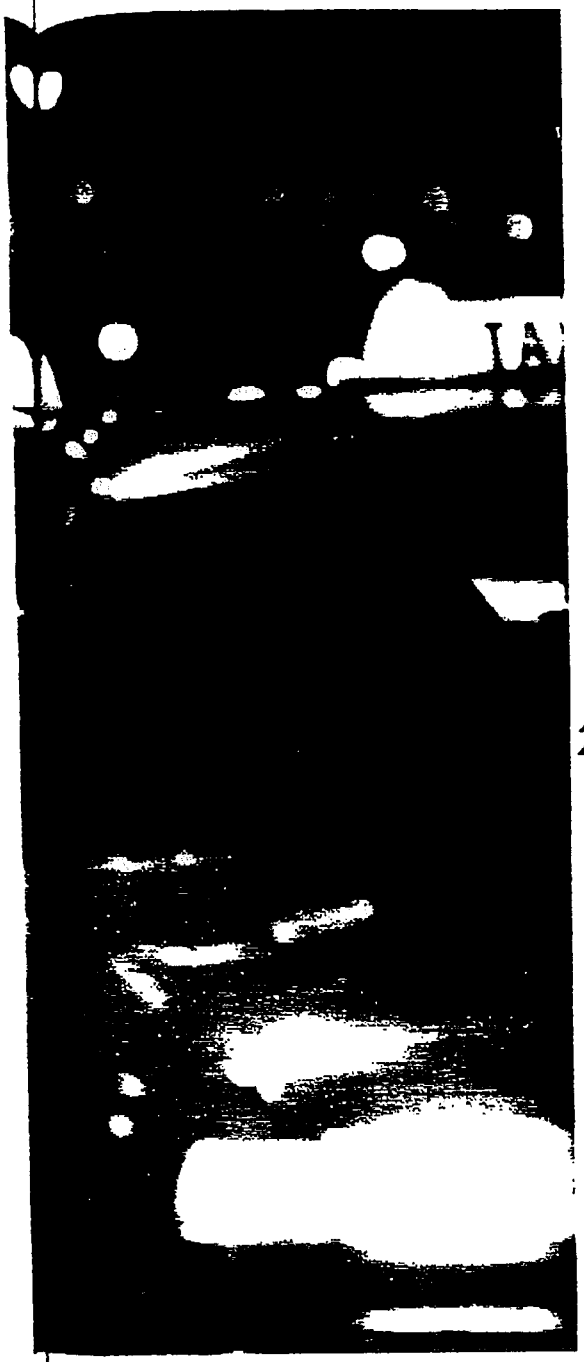

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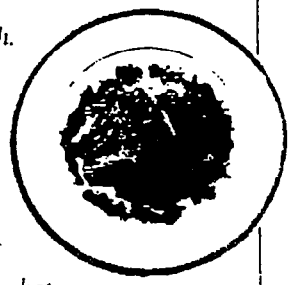

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Exhibit B-82

4TH STORY of Level 1 printed in FULL format.

May 21, 1998; Thursday 13:43 Eastern Time

SECTION: Washington - general news

LENGTH: 830 words

HEADLINE: INTEL-TO-SEEK-NEW sked Intel to seek new markets, NEW STRAITS TIMES-MANAGEM

BODY:
xfdws INTEL-TO-SEEK-NEW

Emerging Markets Datafile

May 21, 1998

NEW STRAITS TIMES-MANAGEMENT TIMES

MALAYSIA

ENGLISH

Intel to seek new markets, NEW STRAITS TIMES-MANAGEMENT TIMES

Ferina Manecksha

ASIA

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AP Worldstream, May 21, 1998

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INTEL Corp, the world's largest chip maker, will continue with its strategy of heading towards a universe of one billion connected computers.

Its chairman Andrew Grove said towards this end, the company has targeted a series of new products, markets and trends as core opportunities.

Among them are processors aimed at higher powered network servers than Intel had traditionally addressed, chipsets for new personal computers (PCs) and most importantly, the on-going technological shift to networking.

According to Grove, the emergence of the no-frills computers is part of the market trend in desktop computers which has divided the computing market into various segments such as workstations and servers at the high end, performance PCs, basic PCs and mobile PCs.

''As a result of the growth of the computing market, it is necessary for Intel to depart from our legacy branding of products. We have divided the PC market into three major brands based on the performance of the machines. ''This includes Pentium II Xeon targeted at the high-end market for servers and workstations, Pentium II processor for the performance PC and the Celeron processor for the basic PC,'' he said in his keynote address at the Asia-Pacific Technology Forum held in Taipei last week.

Grove's visit to Taiwan was part of his three-leg tour in Asia which includes China and Japan.

He also outlined a roadmap for chips that Intel hopes would capture a larger portion of the high-powered server and workstation markets.

However, he added that whatever Intel's success is in networking, the company's primary business will remain in microprocessors for the foreseeable future.

Grove unveiled the company's plan for a new processor called Xeon and has planned a 64-bit chip codenamed Merced, aimed at the high-end server and workstation markets end of next year. He added that Intel will ship auxiliary chips which integrate graphics and logic.

Grove also revealed plans to deliver Katmai, a microprocessor with a speed of at least 500 megahertz (MHz), which is about 25 per cent faster than the top performers in its current line-up, in the first half of next year.

Intel also has plans to incorporate its Pentium II processor into its mobile computers. It will start with increasing the speed from 233MHz and 266MHz to

300MHz scheduled for the second half of this year. By the first half of next year, a mobile model with Pentium II and a system bus of 66MHz will run at a speed of 333MHz.

For the low-priced PCs, Intel has specifically developed the Celeron series of processors. The new branding is part of Intel's efforts to sell more microprocessors to makers of low-priced PCs, a market that the company has made a late entry into.

The newly-launched low-end Celeron processor, which will be available in basic PCs by the middle of this year, is targeted at first-time buyers -both business and home users - who require basic PC functionalities.

The Celeron, which is based on the same Intel P6 micro-architecture as the Pentium II does not have any cache memory which speeds the flow of data from the microprocessor to the other parts of the PC.

More powerful versions of Intel's Pentium II chips have varying amounts of cache memory, depending on their applications.

Pentium II processors will be used in the most advanced machines for sophisticated multimedia applications while the less powerful Pentiums will be used in the mid-range PCs.

Although Grove's visit to Taiwan was to meet with information technology (IT) industry leaders such as Acer's Stan Shih, he said Intel has no plans to manufacture microprocessors in Taiwan nor will it be setting up a research centre like the one being established in China. Last week, the company announced its plan to build a technology research centre and open a US$ 198-million (RM752 million) flash memory assembly and test facility in China.

Grove said the company will provide the latest Pentium II processor-based development systems to more than 10 Taiwanese software companies. In addition, Intel expects its Taiwan purchasing to shoot up over 50 per cent to hit US$ 240 million this year. Grove claimed Intel's market share in microprocessors is currently at a historical high but declined to give figures.

LANGUAGE: ENGLISH

LOAD-DATE: May 21, 1998

1ST STORY of Level 1 printed in FULL format.

Business Wire

May 20, 1998, Wednesday

DISTRIBUTION: Business Editors

LENGTH: 935 words

HEADLINE: Intel's 1997 Contributions Total Over $ 96 Million; Support Targeted to Science, Math and Technology Education

DATELINE: SANTA CLARA, Calif.

BODY:

May 20, 1998--In its 1997 Annual Report of Contributions released today, Intel Corporation announced that in 1997 it contributed more than $ 96 million to colleges and universities, K-12 education, and organizations in communities in which Intel has a major facility worldwide. The report includes giving from the Intel Foundation. Intel's 1997 contributions mark a 73 percent increase over 1996, featuring a new higher education program and expanding K-12 programs.

"Intel believes in science, math and technology education," said Craig Barrett, Intel's president and chief operating officer. "We must put the tools in the hands of our youth, expose them to the best understanding and education possible, and then challenge the next generation to continue the spirit of innovation and scientific discovery."

Four major objectives guide Intel's contributions programs:

-- to advance education in mathematics, science and engineering;

-- to promote the entrance of women and underrepresented minorities into science and engineering careers;

-- to promote public understanding of technology, its impact on contemporary life and its value in education;

-- to improve the quality of life in communities where Intel has a major facility.

Breakdown of Contributions

The largest portion of Intel's 1997 contributions was spent in support of higher education. At the college and university level, Intel's donation of almost $ 70 million focused on scholarships; research in engineering and technology fields; equipment donations to advance university teaching and computing; technician training programs; and programs for women and minorities.

One new higher education program that Intel announced in 1997 was its Technology for Education 2000 program. This equipment grant program was designed to support university research and curriculum development at 26 universities in the United States through the donation of high-speed multimedia computers, workstations, servers, and networking hardware and software. In addition to the traditional areas of engineering and computer science, the grants funded

projects in a wide range of other fields, including anthropology, astrophysics, medicine, biotechnology, business, public policy, journalism and the arts. Contributions to this program in 1997 totaled almost $ 26 million.

At the K-12 education level, Intel focuses on advancing math, science and technology education. To achieve this goal, Intel supplies computer and networking equipment to schools; trains teachers in the effective use of technology in the classroom; supports school-to-work programs in the communities surrounding Intel's major facilities; and provides monetary matching support to encourage employee volunteerism. In 1997, Intel donated more than $ 23 million in support of K-12 programs.

Intel supports several unique K-12 education programs, and in 1997, Intel was named the title sponsor of the International Science and Engineering Fair (ISEF). This annual event, now in its 49th year, is the largest science and engineering competition for high school students in the world. More than one million high school students compete in more than 400 local Intel ISEF-affiliated science fairs in the hopes of being among the nearly 1,200 students who advance to the annual international competition. The top two students and top team from each local affiliated science fair are invited to the Intel ISEF, where they compete in one of 15 science categories ranging from biochemistry to zoology. Over $ 2 million in grants and scholarships are awarded at the Intel ISEF.

In October, Intel unveiled the third edition of its free classroom kit, "The Journey Inside: The Computer," which was developed for math, science and technology teachers to use with their students in grades five through nine. The kit is designed to de-mystify computers and teach the science behind computer and microprocessor technology. It includes a teacher's guide, teacher's introduction video, classroom video, classroom poster and hands-on chip kit, including a silicon wafer. The kit can be ordered by calling 800/346-3029 or by visiting Intel's Web site at www.intel.com/intel/educate/teacher/journey.

In 1997, Intel's contributions to non-education community organizations totaled almost $ 3 million. In addition, Intel employees volunteered time through "Intel Involved" to help local schools and nonprofit organizations. For example, in 1997, Intel Involved volunteers spent the equivalent of 13,756 days in the United States, more than 185 days in Israel and more than 412 days in Ireland working in their communities.

For More Information

Specific breakdowns of Intel's 1997 contributions are available on its Web site at www.intel.com/intel/community/contributions. Hard copies of the 1997 Annual Report of Contributions are available by calling 503/696-8237.

Intel, the world's largest chip maker, is also a leading manufacturer of computer, networking and communications products. Additional information about Intel is available at www.intel.com/pressroom. -0-

Exhibit B-83

STRATEGIC BRAND MANAGEMENT

Building, Measuring, and Managing Brand Equity

Kevin Lane Keller

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This book is dedicated to my mother and father with much love, respect, and admiration.

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APPENDIX B

Intel Corporation: Branding an Ingredient[1]

Introduction

On March 1, 1991, U.S. District Judge William Ingram ruled that the "386" designation used by Intel for its microprocessor family was a generic description and therefore did not represent a trademarkable name. Intel had been confident that the judge would rule in its favor, and the unexpected court decision effectively invalidated Intel's current branding strategy.

Within the last year, buyers of IBM-compatible personal computers had been confronted with a bewildering array of microprocessor options. A microprocessor is the central processing unit (CPU) of a computer. As the "brain" of the computer, the microprocessor, or CPU, executes all computer-program instructions.[2] Prior to 1990, consumers' choices were relatively simple: a low cost "286" computer that used Intel's older 80286 microprocessor or a more state-of-the-art "386" computer based on Intel's newer 80386 microprocessor. By 1991, however, consumers had a choice of personal computers based on one of three generations of microprocessor technology—286, 386, and 486—all available in a variety of clock speeds and bus widths,[3] made by Intel and a number of "clone" competitors. The variety of alternatives was creating significant confusion, and Intel had found it difficult to differentiate its products in the minds of the consumer. The March 1991 court ruling ensured the confusion would continue unless Intel revised its branding and communication strategy.

There was a real sense of urgency throughout the company to establish a trademarkable brand identity that would distinguish Intel products from the competition. This need was particularly acute since Intel expected to announce its next generation microprocessor, code-named "P5," in the fall of 1992. In light of the court's ruling, naming the product "586," as many people expected, would be a risky choice. Cyrix's

recent introduction of its 486SLC chip—an enhanced "386" chip targeted to the notebook market—had clearly illustrated the risk of continuing to use nonprotectable numerical names for products. In addition to immediate competitive concerns, Intel also wanted to address the broader, long-term issue of how to develop brand equity in light of continuous need to introduce new products and technologies. Of specific concern was how to strike a balance between developing awareness of and image for the company as a whole versus for the individual products, which ranged from microprocessors to modems. A key question there was, would Intel, the world's leading brand of microprocessors, be able to develop a strategy that could create a premium brand image for Intel products in markets where Intel was not the clear leader?

Company Background

Intel Corporation was founded in 1968 by Robert Noyce and Gordon Moore (later to become Chairman of the Board). Soon thereafter, Andy Grove (later to become President and Chief Executive Officer) joined the firm. Intel's initial focus was the integration of large numbers of transistors into silicon chips to make semiconductor computer memory. In 1971, the company went public in the wake of two successful memory product introductions, the first LSI DRAM (large-scale integration dynamic random access memory) and the first EPROM (electronically programmable read-only memory). That year also marked the company's first profitable year, with revenues of $9 million and net income of $1 million. Growing rapidly over the next decade, the company quickly became a leading supplier of semiconductor memory for mainframes and minicomputers.

In 1974, Intel introduced the first general purpose microprocessor, the 8-bit 8080. Intel introduced the 16-bit 8086 in 1978, followed by the 8088, the 8-bit bus version of the 8086, in 1979. These microprocessors were the first of the Intel "x86" line of microprocessors. At the time, Intel faced competition from a number of companies, the most serious being Motorola with its 68000 microprocessor. In response, Intel launched a campaign to make the 8086/8088 architecture the standard in the emerging microprocessor market. A critical step in this process was IBM's selection of the 8088 in 1980 as the exclusive microprocessor architecture for its first personal computer. The success of the IBM PC placed Intel at the center of the personal computer revolution and established Intel's x86 microprocessor architecture as the de facto industry standard.

In February 1982, Intel introduced the 16-bit 80286 microprocessor, the first microprocessor to feature multitasking and on-chip security functions that ensured data would be protected. These features allowed a user to run both MS-DOS and UNIX operating systems. The 286 became the brain of the IBM AT personal computer and the AT-compatible clone computers that followed. By 1988, the installed base of 286-based PCs would grow to 15 million worldwide.

In 1985–1986, Intel suffered major setbacks, along with other U.S. semiconductor manufacturers, in face of an industry-wide recession. In 1985, Intel abandoned its DRAM business and struggled to maintain its leadership position in EPROMs. In October of that year, Intel introduced its first 32-bit microprocessor, the Intel386™ DX microprocessor. The Intel386 DX microprocessor had a top operating speed of 5 mil-

lion instructions per second (MIPs), a threefold increase over the 286. The chip had memory management and multitasking features that permitted more sophisticated uses. As a 32-bit processor, the i386™ processor could process information more efficiently than the 16-bit 286 and allow for more powerful software.[4] Intel began volume shipments of this product in mid-1986. In June 1988, Intel introduced the Intel386 SX microprocessors, a lower-performance, lower-priced chip targeted to entry-level systems (for which the DX version was too expensive). The Intel386 chips became the backbone of IBM's and clone manufacturers' growing PC lines and positioned Intel for its explosive growth over the next five years.

In April 1989, the company introduced the first of its next generation microprocessor, the Intel486™ processor. The i486™, a 32-bit processor like the i386, held 1.2 million transistors on a single chip and ran typical PC programs two to three times faster than i386 processor-based machines. The i486 integrated math-processor circuits into the chip for the first time, thereby eliminating the need for a separate math co-processor. The company began volume shipments of the Intel486 processor in early 1990. In October 1990, the company introduced the Intel386™ SL processor, a slow-power consumption, highly integrated, "small" chip targeted to the burgeoning portable PC market.

In 1990, Intel sold approximately 7.5 million 386 and 486 microprocessors.[5] Intel's 1990 revenue from 386 microprocessor sales alone was estimated to be approximately $850 million.[6] As of year-end 1990, Intel was a $3.9 billion company, representing a 360 percent growth in ten years. Net income over the same period grew 570 percent to $650.3 million. Intel microprocessors were found in almost 80 percent of all IBM and IBM-compatible machines. The company, one of the largest semiconductor manufacturers in the world, was recognized as the undisputed microprocessor industry leader.

The Microprocessor Industry in 1991

Since 1986, Intel had been the only supplier of 386 technology, and since 1990, the only supplier of 486 technology. Between the second half of 1990 and the first quarter of 1991, however, a number of competitors had announced intentions to market their own versions of Intel's 386 and 486 microprocessors. The most serious threat came from Advanced Micro Devices (AMD) who in October 1990 had announced its own version of Intel's then hottest product, the i386 SX, called the AM386. Volume shipments were scheduled to begin in March 1991. In January 1991, two small semiconductors firms, Chips and Technologies and NexGen Microsystems, had announced their intentions to introduce 386-compatible chips within the year. Cyrix, a small firm who had successfully introduced a clone of Intel's 80387 math co-processor in 1989, was also actively working on development of its own 386/486 hybrid scheduled for introduction sometime in 1991. Many of these competitors claimed that their 386 microprocessors would rival certain configurations of Intel's i486 chip. Whatever their true technological capabilities, Intel knew these chips could be named "386" or "486" and that they could do nothing to prevent such naming.

As of January 1991, Intel offered over a dozen versions of their 386 and 486 microprocessors. In 1991, the company was expected to introduce six new versions of the

i486 microprocessor, including an i486™ SX, a lower-priced, stripped-down version of its 80486 microprocessor. By 1992, revenues from Intel486 CPU sales were expected to surpass Intel386 CPU revenues. That year, Intel planned to announce availability of its 586-generation microprocessor, internally named "P5" until the name under which it was to be marketed was decided upon.

At the same time that competitors were introducing their own versions of 386 and 486 microprocessors, Intel was facing another long-term challenge at the high-end of its market from the makers of another type of microprocessor known as RISC (reduced-instruction-set computing) chips.[7] By the late 1980s RISC architectures dominated the workstation market, led by Sun Microsystems and MIPS Computers. In 1989, Intel had tried to sell its own RISC chip, the i860™ chip but abandoned the market one year later, refocusing its investments on its x86 line.[8] Because of recent price breaks bringing workstations into the $5,000 range, many vendors could now compete head-on with high-end PCs.[9] Historically, the presence of workstations in the desktop PC market had been limited because they were not compatible with the thousands of software programs written for PCs containing Intel processors and running Microsoft DOS and Windows operating systems. In April 1991, Compaq, Microsoft, and MIPS[10] led the creation of the ACE alliance, a consortium that intended to develop and use operating-system software that would run on both Intel's processors and MIPS's RISC chip.[11]

Branding Issues Confronting Intel

As the market and technology leader, Intel was always the first to introduce a new generation of product and to establish the name and value of the new technology in consumers' minds. With competing products carrying the same or similar names, however, it became increasingly difficult for Intel to differentiate its products from those of its competitors.

Competitors had used Intel's numerical sequencing to name their products since the introduction of the 286. In the case of the 286 and earlier generation microprocessors, Intel had licensed its technology to several vendors who manufactured Intel's technology under their own name. Intel had not licensed its 386 technology, however, so the use of the same numerical sequence did not necessarily reflect Intel's architectural standard as it had with the earlier generation microprocessors. As a result, what one competitor called a 386 chip may or may not have had the same product characteristics as an Intel microprocessor with the same name. Not only were consumers confused about who made a particular generation microprocessor, but also what level of performance to expect from a particular product. In the end, consumers were confronted with a product "alphabet soup" that made establishing a point of differentiation and a distinct brand identity for Intel products increasingly difficult.

Initial Branding Efforts

In the late 1980s, there was a significant shift in the general focus of the personal computer industry toward the mass-market, non-technical business and home PC users. Recognizing this shift, Intel moved from more of a "push" strategy to more of a "pull"

strategy and began to redirect a portion of its advertising efforts away from computer manufacturers to actual computer buyers. Until this time, the consumer's choice of a personal computer was based almost exclusively on the brand image of the manufacturer, such as Compaq, Dell, or IBM. Consumers did not think about the components inside the computer. By shifting its advertising focus to the consumer, Intel hoped to create brand awareness for Intel and its microprocessors, as well as build brand preference for the microprocessor inside the PC. Intel still considered the MIS community to be its primary buyer, but also recognized the growing importance of the retail or "Circuit City"[12] buyer as a significant market segment and wanted a message that spoke directly to it.

In June 1989, the company had experimented with its first print campaign targeted to the consumer. The campaign promoted Intel microprocessors through their numbers—the 286 and 386. The initial ad was an oblique but attention-getting print ad and outdoor billboard that mimicked graffiti by spray painting over "286" and inserting "386SX." The tag line read, "Now, get 386 system performance at a 286 system performance price." The message to the consumer was to purchase a personal computer with a i386™ SX chip, a lower priced version of the i386™ DX chip, which used the latest technology for which Intel was the sole supplier, and not to purchase a computer with the older 286 chip technology, which used technology that Intel had licensed to a number of other vendors. Intel, with a $5 million promotion budget, touted the 386 SX as an investment in the future, offering both higher performance and access to new and future software.

Within months, buyers began asking for personal computers with the Intel386 SX chip, promoting computer companies to expand their production. In 1991, the 80386 SC became Intel's best-selling chip ever, shipping approximately 8 million units.[13] Intel's graffiti ad campaign had successfully introduced the microprocessor to the consumer, and market research indicated that an increasing number of consumers identified with 386 and 486 microprocessor technology.

In June 1990, Intel broadened its campaign to simultaneously promote its new 486 microprocessor as well as the Intel name. Given the recent announcements of rival chip firms, Intel wanted to make sure consumers knew to buy Intel technology. Intel continued with the graffiti type imagery it had used in its earlier ad. The first page of the two page ad showed the numbers, 486, 386, and 386SX, spray painted yellow, green, and red, respectively, on a brick wall, with the text, "The numbers outside." Upon turning the page, the reader saw a huge multicolored "Intel" spray painted across the same wall. Underneath "Intel" read the line, "The Computer Inside." The copy below the ad read: "Since buying a computer today is such a numbers game, here's a simple rule of thumb. Look for i386™ SX, i386™ DX, or i486™ on the outside to be certain that you have Intel technology on the inside . . ." At the bottom of the ad was the Intel corporate logo with the slogan, "The Computer Inside™" below it.

Evolution of the "Intel Inside" Branding Strategy

During fall 1990 and winter 1991, Intel was involved in a trademark case with AMD to prevent the use of the "386" name in a new microprocessor that AMD planned to introduce in spring 1991. Observing testimony in the "386" trademark case, Dennis

Carter, Vice President of Intel's Corporate Marketing Group (CMG), became concerned about the potential impact that a negative verdict would have on Intel's branding strategy. The proliferation of competitive products using Intel's numerical sequencing was already an issue impacting Intel's current branding strategy. A loss in the trademark case would only exacerbate the company's problems in addressing the growing market confusion among product offerings. A negative verdict would mean that in the future *any* competitor could market its products under the same marks used by Intel. It would also mean that any computer maker could call a machine "386" without regard to the manufacturer who supplied the chip. Concerned about the possible negative verdict and feeling a general need to clarify strategy, Carter began developing an alternative branding strategy, although he planned to wait until the court's ruling to decide whether to implement it.

In March 1991, Intel did in fact lose the "386" trademark case. This ruling cleared the way for AMD to sell its new AM386 microprocessor under the "386" name when it began volume shipments later that month. Given the court's decision, it was clear to Carter that Intel needed to change its branding strategy. Knowing that AMD would begin selling its own version of the 386 microprocessor within the month, and that other competitors would soon follow, created a real sense of urgency to make the change quickly. Within a few days Carter proposed a new processor branding strategy to Intel's executive office. The strategy recognized Intel's status as an ingredient supplier to PC OEMs and consisted of three elements: (1) the use of a logo based around the words "Intel Inside" to represent Intel processors used in PCs, (2) the use of MDF funds to share PC OEM advertising expenses, and (3) an Intel advertising program to build equity in this new brand. The strategy was accepted and Carter immediately established a task force whose sole mission was to implement this new branding strategy. In the interim, Intel would refer to its microprocessor as the "i386" and "Intel386," both Intel trademarks.

The first action of the task force was the introduction of a new ad using the "Intel: The Computer Inside" slogan. This ad, focused primarily on raising awareness of the Intel name, asked the reader, "Quick, do you know the first name in microprocessor?" showing a blank line in front of the numbers 486, 386, and 386SX. Turning the page, the blanks were filled in with the word "Intel." With the ad, Intel put the company's name directly in front of the consumer. In addition, Intel486, Intel386, and Intel386 SX microprocessor were all trademarked names. The ad copy sought to assure the reader that purchasing a personal computer with an Intel microprocessor inside was a safe and technologically sound investment, providing "the power and compatibility to take you into the future." At the bottom of the ad was the Intel corporate logo with the slogan, "The Computer Inside™" below it.

Despite not having a detailed preset plan, the task force established the fundamentals of a new branding strategy within a month of the court decision. The primary focus of the new strategy was the establishment of Intel as a brand, transferring the equity of "386" and "486" microprocessors to Intel, the company. Much of the brand equity Intel had at that time was in the numbers. Given the court decision and the increasing level of product confusion, Intel rejected a product-based brand strategy in favor of a strategy that focused on establishing the company's brand image. Establishing a unique identity for Intel was considered the best way not only to distinguish Intel products, but also to communicate the depth of Intel as a corporation with re-

spect to its competitors. Intel wanted to sell the whole company, not just microprocessors. While the majority of the company's revenues were derived from sales of microprocessors, the company offered a broad range of products for the computer industry, including microprocessor peripherals, multimedia products, microcontrollers, flash memory, OEM modules and systems, supercomputer systems and PC enhancement products. Dennis Carter explained:

> We wanted to brand the whole company, but in a way that was clearly focused on processors. An initial proposal that I rejected early on that Intel Japan was proposing to do within Japan was to brand all components. That would not, however, solve our current problem. The branding program had to carry the Intel name and image but focus on selling processors.

At the heart of the new strategy would be an advertising campaign that, according to Carter, would "cut the 'utter confusion' clones bring to the marketplace (and) drive the premium-brand message home to PC buyers."[14]

Critical to the establishment of Intel as a brand was the need to reverse perceptions of Intel as an impersonal, unfriendly technology company. If Intel was to gain the consumer's trust for its products, Intel knew the consumer had to feel good about the company itself. Intel wanted to establish a brand that offered the promise of "safety" and "technology" to the consumer. By convincing consumers that a computer with an Intel microprocessor inside was a safe investment in leading edge, software-compatible technology, Intel hoped to establish its microprocessor as the premium product and thereby command a premium price. The consumer would not necessarily need to know exactly who Intel was or what it made as long as he or she could be convinced that a personal computer powered by the "creator of microprocessors" was preferable. Intel also believed that if it could gain consumer confidence in Intel as a brand, it would be able to use the Intel name to help move the market forward into new generations of microprocessors and to transfer the equity of the Intel brand to new products and technologies.

Choosing a Logo

Since Intel's products were always inside the computer, unseen by the average purchaser of a personal computer, the company wanted to make the consumer believe that what was inside the computer was as important, if not more important, than the company that assembled the components and placed them inside a box. Intel's "The Computer Inside" campaign had not been explicit enough in linking Intel's name to the microprocessor inside the computer. The company needed a slogan, logo, or some other means that more explicitly identified an Intel microprocessor as the essential ingredient when purchasing a computer.

Carter had previously wanted to use "The Computer Inside" campaign in Japan. Intel's agency in Japan, Dentsu, believed the slogan was too complex and recommended modifying it to "Intel In It" instead, presenting it in a logo form. Japan adopted this logo and began using it for all Intel products, not just processors. Needing a logo for processors fast, Carter, as part of his recommendation to the executive

office, suggested using this logo form as the basis for the new microprocessor logo. In order to keep continuity with "The Computer Inside" tag line being used elsewhere in the world, Carter changed the phrase to "Intel Inside" which clearly conveyed to the consumer that it was an Intel microprocessor in the computer. For a number of executional and trademark reasons, the Japanese logo form was modified. The new logo—a swirl with Intel Inside—placed the company and its name directly in front of the consumer.

Communications Strategy

Essential to executing its new branding strategy and establishing awareness of its Intel Inside® logo was getting the support of the OEMs who used Intel microprocessors in manufacturing their products. The most important group of OEMs were the personal computer manufacturers who purchased the vast majority of Intel's microprocessors. Intel's first priority was to get these manufacturers to include the Intel Inside logo in their print ads. In addition to this "push" strategy, the team planned Intel-sponsored advertising and promotions to build equity in the logo and create a "pull" preference among consumers for Intel products. For this pull strategy to work, however, it was also important to make it possible for consumers to easily recognize that a computer had an Intel microprocessor at the point of purchase.

ENLISTING SUPPORT OF OEMs

To enlist the support of OEMs for its Intel Inside program, Intel developed a cooperative advertising program available to all computer manufacturers who used Intel microprocessors. Intel offered computer manufacturers rebates to include the Intel Inside logo in the print ads for their products. Negotiating with a broad range of OEMs in June 1991, Intel found much positive reaction among OEMs to the idea. The smaller, third-tier manufacturers in particular loved the idea. They had no brand name of their own and promoted their products primarily on the basis of price. Print was their main medium of communications, so any advertising subsidy was considered very beneficial. In addition, adding the Intel Inside logo to their machines gave an assurance of quality to their product, and they proved eager to sign on.

The first and second tier OEMs were more skeptical. Many of these OEMs were afraid that the Intel campaign would dilute their own brand equity, weakening their points of differentiation from one another. According to Kevin Bohren, a Compaq vice-president, Intel's campaign "was leveling the playing field," thereby making Compaq's efforts to differentiate its PCs from clones harder.[15] It was this group, however, that Intel needed most to ensure the success of their strategy.

"INTEL INSIDE" PROGRAM

Intel officially announced the launch of its Intel Inside program in November 1991. Specifically, the company announced its intention to spend approximately $125 million during the next 18 months on a combination of print, billboard, and spot television advertising. Of this total, $15.2 million represented direct expenditures by Intel.[16] Intel also announced that 240 customers had agreed to participate in a cooperative ad-

vertising program and to carry the new Intel Inside logo on their packaging. For participating in the program, Intel offered to rebate 30–50 percent of the cost of any print ads that included the Intel Inside logo, up to a maximum of 3 percent of the cooperating company's Intel microprocessor volume. Dennis Carter described the program as "trying to create a brand image for products that fall under the Intel Inside umbrella."[17] As one reporter described the campaign, "The 'Intel Inside' campaign . . . is aimed at changing Intel's image from a microchip-maker to a quality standard-bearer."[18]

All advertising that included the Intel Inside logo was designed to create confidence in the consumer's mind that purchasing a personal computer with an Intel microprocessor was both a safe and technologically sound choice. All elements of the Intel Inside program focused on reinforcing those two key associations—"safety" and "technology"—whenever and wherever consumers saw the Intel Inside logo—in an Intel TV ad, a computer manufacturer's print ad, or at the point-of-purchase in a store. By successfully creating consumer "pull," the competition would not only have to create its own distinct image with consumers, but also supply some reason for an OEM to use its product in the absence of any consumer demand.

Intel planned to focus its own ad campaign on products where it was the sole supplier, such as its 80486 line. According to David House, an Intel senior vice president microprocessor products, "Intel hopes to encourage users to skip the i386™ and go right to computers using i486™ chips."[19]

OEMs AND THE INTEL INSIDE PROGRAM

IBM was the first major OEM to use the Intel Inside logo. With the introduction of its first 486-based PC in April 1991, IBM offered to use the new logo—still in draft form. Intel faxed IBM a rough drawing for its use in the ad. IBM would not tell Intel where on the ad it would be located, and all the marketing task force could do was hope for prominent, high visible placement. In fact, the Intel Inside logo was clearly visible in the ad layout. After running this ad, however, IBM did not use the Intel Inside logo again for nearly a year.

By December 1991, over 300 OEMs had signed cooperative advertising agreements with Intel, up from 240 the previous month, including first, second, and third tier manufacturers. Over 100 of these companies featured the Intel logo in their ads, including Zenith Data Systems, Everex Systems, NCR Corp., Dell Computer, and AST Research.[20] Nevertheless, at this time the largest first tier computer manufacturers—including Compaq and IBM—still were not using the Intel Inside logo in their ads.

INTEL'S AD CAMPAIGN

Simultaneous with the development of its OEM co-op advertising program, Intel developed its own Intel Inside ad campaign. The first ad using the Intel Inside logo was a print ad that ran in July 1991. This ad, affectionately called the "measles" ad, showed the Intel Inside logo splashed across a page. The headline read: "How to spot the very best computers." At the bottom of the page, was the tag line: "Intel: The Computer Inside™." The primary objective of this ad was to get the new Intel Inside logo in front of consumers and get them familiar with the Intel name. The ad text promoted

Intel as "the world's leader in microprocessor design and development" and reassured the reader that "with Intel Inside, you know you've got unquestioned compatibility and unparalleled quality. Or simply put, the very best computer technology." The ad ran in both computer trade publications and consumer magazines such as *National Geographic* and *Time*.

In November 1991, Intel launched its first TV ad, dubbed "Room for the Future." In this ad, Intel sought to move the market to i486 technology. A key consumer concern was the protection of their personal technological investment. With the i486 SX processor, consumers would be able to upgrade their computers with another new Intel product, the OverDrive® processor, due out in the first half of 1992. The ad stressed investment protection by emphasizing both the affordability of Intel486 SX technology and the added feature of "built-in upgradability." A secondary role of the ad was to fix a problem in product perception that they were experiencing in the market. The i486 SX, a stripped-down version of its i486 DX chip, had become known as the "brain-dead chip" because it did not include the math co-processing capabilities people had come to expect from 486 technology. By promoting the "built-in upgradability" of the chip, Intel hoped to overcome consumer's concerns about the i486 SX chip.

The ad, developed by Intel's ad agency, Dahlin Smith White (DSW), used special effects designed by Lucas Arts' Industrial Light and Magic Co. The ad took viewers inside the computer, giving them a whirlwind tour of the inside of a personal computer to show how the Intel486 SX chip streamlined computer upgrading. At the end of the ride, a flashing "Vacancy" sign indicated where the faster chip of the future might go—either a math co-processor or the soon-to-be introduced OverDrive processor. Careful not to use any "technospeak," a friendly voiceover said, "Something's waiting inside the powerful Intel486 SX computer. We call it . . . room for the future. Check into it. From Intel. The Computer Inside." In shooting the ad, however, the Intel Inside logo was not included. This oversight was not recognized until late in the production process, and could only be added on a coffee cup at the beginning of the spot. The TV spot ran throughout November and December on CNN and ESPN and on eleven major metropolitan stations during "Star Trek" and "Star Trek: The Next Generation."[21]

In conjunction with the TV ad, Intel also ran a print version of the Intel486 SX commercial. The two-page ad ran in *The Wall Street Journal, Business Week, Fortune, PC Week, Infoworld, PC Magazine,* and *Time*. The first page repeated the opening line of the TV ad, "Something's waiting inside the 486 SX computer." The following page displayed the inside of the computer with a "Vacancy" sign pointing to an open slot next to the Intel486 SX microprocessor. The tag line read, "Room for the future. Introducing built in upgradability." The text below the picture promised the reader that Intel would have "something" of value that would help protect the purchaser's investment. Because the new OverDrive processor was not scheduled for introduction until May 1992, the ad could not talk directly about the OverDrive processor itself. A version of this Intel486 SX processor ad was placed on billboards in Los Angeles, San Francisco, Chicago, Toronto, and seven other metropolitan markets.[22] Finally, the company prepared a small booklet describing in detail capabilities of the Intel486 SX microprocessor. Two pages of text were devoted to describing each of the following product attributes: upgradability, power, affordability, compatibility, and the experience of Intel.

The "Room for the Future" ad was Intel's first experiment with television as an advertising medium. Dennis Carter explained, "We thought it might be an interesting cost-effective way of reaching a broader audience more effectively—a more impactful way to augment the print advertising campaigns that we do."[23] Consumer research indicated that most viewers of the commercial remembered the Intel name, rather than the product, the Intel486 SX chip, being advertised. Intel's print ads, on the other hand, proved much more successful in educating the consumer on specific product attributes associated with the Intel486 SX processor.

In March 1992, Intel introduced its second television ad. The "Power Source" ad promoted the Intel486 processor as a mainstream computing solution, emphasizing its power and affordability. DSW's vice president and group account manager, David Boede, described the shift as reflecting "a combination of prices dropping for the 486 machines, as well as the complexity of Windows software."[24] As if in the cockpit of an aircraft, the viewer sweeps through the "insides" of a personal computer. Hovering briefly over the Intel486 chip itself, the voiceover said: "Want to run your windowing software fast? Then you need a real power source inside. The affordable 486. Power it up and run your software at light speed." At the end of the spot, a picture of the Intel Inside logo dramatically flashed and swirled on the TV screen, while the voiceover said: "The computer inside."

A second version of this ad was introduced in August 1992, highlighting the upgradability of Intel486 microprocessors. At the beginning of the ad, the camera zoomed towards the outside of a personal computer displaying the Intel Inside logo. The voiceover said: "Want to run all your software fast? Then look for the Intel Inside symbol on your next computer." The viewer was then taken inside the computer on a trip similar to the original "Power Source" ad. Inside the computer, the voiceover continued: "It says you have a real power source inside like the upgradable 486 microprocessor. Power it up and run your software at light speed." Like the original Power Source ad, the spot ended as a picture of the Intel Inside logo flashed and swirled on the TV screen, while the voiceover said: "The computer inside."

In developing these ads, Intel's marketing group had mixed opinions as to whether the Intel Inside logo or the company name should finish the commercial. Those who favored the use of "Intel" thought the company name was discrete and distinct from the product being advertised, and hence would be more likely remembered and could be used more effectively in advertising other Intel products in the future. Others favored using the Intel Inside logo to both motivate OEMs to join and/or remain with their co-op print ad program, as well as to enhance consumer familiarity with the Intel Inside logo. Ultimately, the Intel Inside logo was chosen and, this time, was featured prominently in the ad. The ad ran on both network and cable television, including CNN, A&E, and the Discovery Channel.

Complementing the TV campaign was a print campaign launched one week after the initial airing of the TV ad. The print ad headline read: "The affordable power source for today's software." The copy, written person-to-person to the computer buyer, described what was unique about an Intel chip: "With an Intel486 microprocessor inside, you can take full advantage of today's graphical software. In fact, where other systems get bogged down, like running Windows applications simultaneously, the Intel486 CPU powers through these kinds of challenging operations easily. Plus, the Intel486 CPU will keep generating the power you need beyond today."[25]

In October 1992, Intel began a two-month run of its third Intel Inside TV ad. The "Library" ad promoted the compatibility of Intel-equipped personal computers with leading software packages. Once again, the ad first focused on the outside of a personal computer with the Intel Inside logo. The voiceover said: "This symbol outside means you have the standard inside that an entire library of software has been written to." The ad then took the viewer inside the computer through a library of software, including Microsoft and Lotus products. The trip ended with the camera focused on a microprocessor stamped with the Intel Inside logo. The voiceover continued: "Check out computers with Intel. To run an entire library of software, look for this symbol. The Intel microprocessor . . . think of it as a library card." The ad ran on network and cable stations, including CNN. Programming choices included news, sports, and shows such as "Quantum Leap" and "Star Trek: The Next Generation." A print ad version of this ad was created, too.

Intel Inside Program in 1992

By December 1992, over 700 customers were participating in the program, up from 400 in April 1992, primarily consisting of second- and third-tier OEMs.[26] According to Dennis Carter, by July 1992, at least half the computer ads in personal computer magazines included the Intel Inside logo.[27] Participating OEMs were pleased with the results of the co-op program, and many claimed that the Intel Inside logo had boosted their advertising effectiveness.

> "The Intel Inside program has been a good program for us. It has helped add some credibility and enhancements to our messages," says Bill Saylor, manager of U.S. advertising for NCR. The advertising manager with another leading compatible maker says the logo communicates a quality message . . . "You know our product is a quality product because it has an Intel chip in it."[28]

For the first twelve to eighteen months of the Intel Inside co-op program, the first-tier OEMs remained reluctant to use the logo. Initially, they would only include the Intel name in the copy of their ads as part of their product description. As the logo became more familiar to the public from all the exposure it received from advertising by other OEMs, however, they ultimately adopted the logo into their own advertising. Their decision was partly influenced by feedback from computer resellers that people were asking for computers with Intel Inside logo. As Sally Fundakowski, a member of the marketing task force described the evolution of the OEM co-op program: "It took a long time to crack the big guys, but we did it."

In late 1992, Intel announced plans to introduce more than 25 versions of the Intel486™ microprocessor during 1993. Throughout the remainder of 1992 and into 1993, Intel planned to continue to focus its advertising message on the technological performance and software compatibility of Intel microprocessors. Most ads would highlight the company's new IntelDX2™ microprocessor, an enhanced version of its Intel486 DX microprocessor, released in March 1992. The print ads for the IntelDX2

chip would show it in the pictorial component of the ad and describe its specific benefits in the ad text.

Another set of ads would simply show a microprocessor with the Intel Inside logo stamped on top and describe the attributes of Intel microprocessors in general. In all the ads, the Intel Inside logo was placed to the left of the first lines of text. The slogan—"The Computer Inside"—was substituted with the Intel company logo (with the dropped "e") at the bottom right corner of each ad. In 1993, Intel planned to add the iComp® index, an internally developed rating system that indicated the relative performance among Intel microprocessors, to all its ads.

Branding "P5"

Intel had been working on its next generation processor, code named "P5" since 1989, and expected to introduce it sometime after the fall of 1992. Unlike previous processors, though, it was not obvious what Intel should name the "P5" or how it should be branded in light of the developing Intel Inside program.

The Intel Inside program had generated a lot of awareness for Intel and made the company and its chip program newsworthy in the eyes of the general and business press. The existence of the Intel Inside program also meant that any branding strategy developed for the "P5" would have to work in conjunction with the Intel Inside program. The heightening of competition over the last year within the microprocessor industry had generated unusually keen interest in the "P5," and both the technical and business markets were looking for information on the product—its capabilities, its expected introduction date, *and* its name.

A critical event occurred on March 24, 1992 when Cyrix announced plans to introduce a 486SLC processor—targeted to the notebook market—in mid-April. The financial community reacted with a $2/share drop in Intel's stock price that day. Six weeks earlier, Intel had begun to market its own chip targeted to the notebook market. The Intel386™ SL chip was an integrated chip designed to minimize power consumption, a problem specific to the notebook market. The company had developed a series of ads designed to build brand equity in the SL name and get the SL name linked specifically to notebook computing.

Though the Cyrix chip was essentially "386" generation technology, naming it "486SLC" gave the impression that the Cyrix product was a "486" generation product and hence more advanced than Intel's own i386 SL chip. By positioning the product as "486," Cyrix negatively impacted Intel's i386 SL branding strategy and forced the company to review the possibility of altering the chip's name. After much deliberation, Intel concluded it could not change the i386 SL name given that the product was actually selling in the market but the episode significantly influenced Intel management's thinking concerning naming strategies.

Because of these and other events, the team knew they would have the attention of the public whenever they were ready to tell their story. However, the heightened interest in Intel and its new generation processor meant that it would be critical to manage the communications process and information flow carefully to ensure that the correct story was told.

Naming "P5"

Carter appointed Karen Alter to manage the "P5" naming process. She formed an ad hoc team whose first concern was choosing a name for this new processor. The team wanted a name that would stand on its own as well as indicate the generation of the new chip. Clearly the court's decision that numbers were not trademarkable and the recent experience with the i386 SL made the choice of "586" a risky one. In a June 1992 interview with an AP reporter, Andy Grove was quoted as saying: "Over my dead body will this new product be named 586." This quote was picked up by newspapers around the world, thus laying the issue of a numerical name to rest once and for all.

With the "586" option eliminated, the team decided to use the naming of the "P5" as an opportunity to redefine the industry language for microprocessors. Naming "P5" offered Intel the opportunity to create a new brand with a clean slate that could acquire equity of its own over time and make it more difficult for other CPU suppliers to get a "free ride" from Intel's equity.

In specifying criteria for the choice of a name for the "P5," the team decided that it was necessary that the name: (1) be difficult for competition to copy, (2) be trademarkable, (3) indicate a new generation of technology that could effectively transition from generation to generation, (4) have positive associations and work on a global basis, (5) support Intel's brand equity, and (6) sound like an ingredient so that it worked *with* Intel's partners' brand names. In selecting the name, the team's primary target audience was the retail consumer. While a key objective was to establish credibility for the new product with early adopters—industry technology experts—they knew this group did not really care that much about the actual name of a microprocessor per se.

Intel's sales force surveyed a broad range of customers during a two-month period to get their reaction to the planned naming concept (e.g., to not use a numerical name). Some customers told Intel that changing the industry language by not using "586" was not possible. They argued that the industry moved too fast, that the market was already on a level playing field, and that the product was too complicated to "reeducate" the consumer. Others, particularly the technologically sophisticated OEMs, liked the idea as a way to differentiate Intel technology. A distinctive name would allow them to distinguish their products from lower-tier manufacturers in the PC market, as well as from their competition in the workstation and server markets.

Inside of Intel the managers viewed this naming process as a major strategic move. As Karen Alter explained:

> Here we are—a company that spends $2 billion a year on capital and R&D. Every 2 to 3 weeks we would get together with the senior executives who *wanted* to be locked into a room to talk about this issue. Everyone had come to believe that technology was moving so fast that communicating to the end-users and getting them to buy the right technology was critical. It would be a huge competitive advantage for us if we got it right. Even though it's a little name, we had to get it right the first time because we wouldn't get a second chance.

Name Selection

Intel undertook the most extensive search in its history to find a name for the "P5." In addition to hundreds of names generated from the task force's own brainstorming sessions, Intel hired Lexicon—a naming firm—and ran a company-wide naming contest in which over 1200 Intel employees worldwide participated. Some of the more humorous entries submitted included, "iCUCyrix, iAmFastest, GenuIn5, and 586NOT! The company also received a number of unsolicited suggestions from many individuals around the world. A 16-year-old Australian boy submitted a detailed proposal for SWIFFT, short for Speed With Intel's Fastest Future Technology. *Computer Reseller News*, an industry trade publication, even held its own contest! In all, the selection process generated 3300 names. Karen Alter described the process that followed:

> Compared to 586, every name sounded terrible because it lacked the familiarity of the x86 naming scheme. It appeared that there were no exciting protectable names, but we knew we had to get over it. We divided the names into three concept categories: (1) closely linked to Intel; (2) technologically "cool"—e.g., naming an architecture; and (3) completely new with some generational concept embedded. We then discussed the pros and cons of each concept category and selected ten alternatives for extensive review and testing.

The company conducted a very detailed global trademark search to insure that each name on the list could not be copied, as well as a worldwide linguistic review to ensure the name would be effective in all languages. Certain that each name on the list was trademarkable and linguistically correct, the company then tested each name and its related concept with MIS and end users in the United States and Europe to determine how well each name met the established goals. In particular, the team asked the participants to evaluate each name for negative and positive associations, memorability, willingness to use, appropriateness for the product, and ability to merchandise. In addition, the team got internal input from its Asia Pacific and Japanese counterparts.

The task force discussed pros and cons for each of the ten tested names and selected one name from each of the concept categories to present to the top management executives for a final name selection. The final three name options for the respective concept categories were: InteLigence, RADAR1, and Pentium.[29] Finally, ten days before the planned announcement of the official name, the company's top executives and the members of the task force met to make the final name selection. Grove led the meeting, asking each participant to choose from the three alternatives and to tell the group what he or she liked about that name and why. Grove and Carter did not give their opinions, saying that they would make the final decision after the meeting was over. Once the meeting was over and a name was chosen, Grove told the group, the topic would never be discussed again.

Not surprisingly, the members of the task force were almost evenly split across the three names. The public relations members of the task force liked the InteLigence name because it was the easiest name for them to explain to the public. The technically oriented members liked the "techie cool" name, RADAR1. The sales/marketing-

oriented members were partial to the Pentium name because it was new *and* represented the cleanest break. As a result, they felt that it would be easier to sell to OEMs and other customers. After everyone had given his or her opinion, Grove and Carter thanked them and went into Grove's office to make a final decision.

Communicating the New Name

Since the name would not be chosen until the last possible moment, the task force had to decide on a communications strategy without knowing exactly what name they would be communicating. Consequently, they developed a communications timeline for introduction of "P5"—from name announcement through products and systems launch. The task force planned to release information so as to create a "crescendo" effect by the time the product was actually introduced into the market and available for sale. A key question was how to announce the name—during a speech, press conference, television program, or what? A primary objective of the task force was to capture the attention and interest of the press so that by the time the new chip was shipped in volume, everyone would know the name of the new chip and no one would even think about "586." Even though the name would not be officially announced until October 1992, by September 1992, Intel's public relations efforts had effectively decreased mention of the "586" name in published press articles to 17 percent of press articles worldwide, from 55 percent in February.

When the naming options had been narrowed to three choices, the task force considered the impact of each name on the multiple audiences—press, OEMs/dealers, competitors, and employees—to whom they would have to communicate the decision. They knew it was critical to establish a consistent worldwide set of messages and to provide the field—sales representatives, MDMs, AMs, FSEs—with all the necessary information. Without question, many people would react negatively to any name that was not "586" and Intel wanted to counter this reaction as quickly as possible. In preparation for the name launch, the task force developed a series of presentations for customers to keep them informed of the naming process and timing of the product's introduction. The company made formal presentations explaining the company's intentions and asking for "help and understanding in launching the new name, even before it was made public."[30] Intel hoped the computer companies would market the name to users as a key product ingredient, much like Nutrasweet, Teflon, and Gortex. As one Intel spokesperson explained, "The market is changing and with other people (competing chip makers) introducing a key ingredient, you don't know what part you're getting inside."[31] Intel also hoped the computer companies would market the name to users as a way to convey the power and efficacy of its fifth-generation processor family.

Immediately prior to the name announcement—and after the final "naming" meeting—Intel wanted to communicate its decision to its top customers around the world. Karen Alter explained:

> Prior to Andy's announcement, one other person and I shipped out documents around the world so our sales force could contact our top 30 customers and tell them