Status Report

Fault-Tolerant Computers: A Progress Report

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Summary and Recommendation

1983 was a disappointing year for fault-tolerant computers. Except Tandem, vendors have promised much but have delivered little since the publication of our 1/20/83 *Status Report*—"Fault-tolerant Computers: Fast Growing Computer Markets Increasingly Demand Very Reliable Systems." Nevertheless, we continue to believe that demand for fault-tolerant systems will grow rapidly throughout this decade, driven by the development of on-line applications for which computer downtime is increasingly unacceptable, such as ATM networks, POS systems, "paperless" factories and home information systems.

- *Much promised, little delivered.* Although the list of companies planning to market fault-tolerant systems continued to grow in 1983, Stratus, with 1983 revenues of $20 million, was the only vendor other than Tandem to ship more than a handful of systems. Many of the other players faced disappointments and slippages; developing and marketing these sophisticated computer systems is more complex than some had anticipated.

- *Demand for fault-tolerant systems continues to grow.* The major breakthrough in 1983 was in user awareness. Besides all the publicity given to the new entrants, IBM, Digital Equipment, NCR and Hewlett-Packard introduced their customers to new systems with some fault-tolerant features. Computer users are beginning to realize that they can minimize the cost of downtime for their critical on-line applications through fault-tolerant systems.

- *Tandem is in a strong competitive position.* We continue to recommend purchase of TNDM (see our 5/2/84 *Update).* Despite its recent problems, Tandem continues to dominate the fault-tolerant area. It has done a tremendous job of establishing its credibility in large corporations as *the* NonStop company. Tandem's proven product, track record and marketing strengths present a significantly greater obstacle to its competitors than do technical barriers. (After all, companies generally use fault-tolerant computers for their most critical applications).

- *Traditional vendors continue to move slowly.* Constrained by enormous investment in their existing computer systems, traditional mini and mainframe vendors have been slow to add fault-tolerant capabilities. Nevertheless, most of them now appear to have accepted the need to add fault-tolerant capabilities. However, this represents a sizeable development effort and is not going to happen overnight.

- *UNIX provides biggest opportunity for new players.* The anticipated rapid growth of UNIX-based systems (see our 1/6/84 *Status Report,* "UNIX—Breaking Down Barriers in the Computer Industry) presents the biggest potential opportunity for the new entrants. Although in 1976 Tandem had little option but to build its own operating system, it is now unnecessary to "reinvent the wheel." Despite this, both Synapse and (to a lesser extent) Stratus elected to do so, putting them at a potential disadvantage against the anticipated rapid growth in applications software for UNIX-based fault-tolerant vendors such as AT&T, Auragen, Computer Consoles, Parallel Computers, Sequoia and Tolerant. Which of these succeeds is more likely to be determined by effective marketing than by which has a "better mousetrap."

- *Tandem, Stratus and (of the new entrants) Tolerant Systems are likely winners.* We are impressed by the marketing focus of these three companies; Tandem's credibility stands it in good stead in addressing very large scale applications. However, Tandem's focus on the high end leaves a significant opportunity for Stratus to address smaller applications. Although we are impressed by Stratus' progress (coverage will be added later this year), the limited amount of third party applications software built for its proprietary system may force it to switch to UNIX. Neither TNDM nor STRA are focusing on the OEM community, leaving a significant opportunity for a third player. Of the new players, we are most impressed with (privately held) Tolerant's OEM-oriented product strategy.

May 24, 1984

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Much Promised, Little Delivered

In some ways, 1983 was a very significant year in the fault-tolerant area. *Stratus*, the first of the new breed of fault-tolerant vendors, went public in August 1983 at a valuation of $210 million. New startups continued to attract the attention of the venture capitalists, and institutional investors began to participate in a growing number of private placements. *Auragen* (formerly known as Parallel Computer Systems) introduced its system with great fanfare at the National Computer Conference in May 1983, and *Synapse* advertised heavily in the trade press. Charlie Ryle and Mike Green, both former key executives at Tandem, joined existing start-up *Parallel Computers*, and shortly thereafter attracted a major infusion of venture capital. A few new players have emerged, such as *No-Halt Computers*, *Autech* and *Encore* (founded by former Prime CEO Ken Fisher).

Traditional vendors such as IBM, DEC, Wang, NCR and Hewlett-Packard began to take the subject seriously. *IBM* announced some fault-tolerant features on the Series/1 and 8100 systems. *DEC* introduced its VAX Cluster system. *Trilogy* went public on a plan to build systems based on wafer-scale semiconductor technology that would feature on-chip fault-tolerant circuitry. Amdahl suggested it was planning to compete against Tandem with an IBM-compatible system designed specifically for on-line transaction processing (code named Aspen). IPL Systems announced an IBM-compatible fault-tolerant system–the 4480.

However, very few of the players are today shipping product. Many of the vendors have found it more difficult than they had anticipated to develop a mature, stable product. (What is the point of a fault-tolerant system, unless all the wrinkles are worked out?) Many of the players are still in development, or early Beta-test (i.e., initial customer trials).

Even those vendors who have begun to ship products have found it more difficult than they had anticipated. Only *Stratus* has made much progress so far, with $20 million in shipments in 1983. However, we believe that this also was somewhat of a disappointment. Both a shortage of applications software for STRA's proprietary operating system and the slow buildup of its end-user marketing organization were factors constraining its growth in 1983. Nevertheless, STRA should be commended for its excellent marketing job, which leaves it well positioned for future growth providing it can attract third party software.

Although *August Systems* began to ship its fault-tolerant process control systems in 1981, 1983 revenues of less than $5 million were disappointing. Although hindered by the economic situation, August found that marketing its sophisticated systems to large corporations such as Mobil, Dow, Conoco and GE was an expensive and time consuming task. Nevertheless, the company has now established a track record and has the potential for considerably faster growth.

Synapse was another disappointment in 1983. Although it shipped its first system on December 31, 1982, the company had 1983 revenues of only $3 million and is now significantly behind its original plan. The company has made its share of mistakes. First, it not only developed a very sophisticated hardware design, but also chose to build its own operating system and database management system—compounding the risks of technical problems, which it faced through most of 1983. Second, unlike Stratus which decided to undercut Tandem in price, Synapse positioned the product more directly against Tandem. Third, it marketed the product before it was ready and has spent $20 million to reach its present stage. Nevertheless, Synapse now claims that the product is stable and can deliver high price/performance (a medium-sized, $600,000 system recently benchmarked 150 users at 9 transactions per second, with an average response time of 1.3 seconds), although the system has not yet been used in a live environment.

Like Synapse, *Auragen* is also probably guilty of launching its product too early. Although it has shipped a number of systems to its European partner, Nixdorf (which recently launched a repackaged and simplified version of the Auragen system in Europe as the Nixdorf 8832), it only has one Beta test site in the US. Although it now has three orders, first customer shipments are still a few months away and we estimate that the company is about a year behind its earlier projections. (Although its system is based on UNIX, Auragen found it necessary to rewrite major portions in 1983 in order to implement its "message-based fault-tolerance"). We also understand that the hardware is still performing below its target goals. Auragen has modified its marketing strategy, shifting from end-users to OEMs. Its relationship with Nixdorf may prove to be a mixed blessing; Nixdorf has manufacturing rights and non-exclusive worldwide marketing rights, which could put the two companies head-to-head in the U.S. market.

Demand for FT systems continues to grow: downtime can mean lost revenues.

Contrary to the current wave of doubt over the market potential for fault-tolerant systems following Tandem's weak second quarter, we are even more convinced than we were a year ago of the necessity of fault-tolerance for the on-line, computerized applications of the 1980s. Despite significant improvements in the reliability of traditional systems, particularly disks, the number of applications requiring the degree of reliability only achievable on a fault-tolerant system continues to grow rapidly.

Demand for fault-tolerant systems is driven by the increasing dependence of companies on computer systems. Today the computer system is no longer just a "back-office" system; it is increasingly a key aspect of a company's design, manufacturing and/or marketing functions. Companies are developing new products based on on-line computer systems—such as ATM networks, cellular radio systems, electronic mail services, home information systems. Here the computer is part of the product itself, a *key component in the revenue generation process.*

Fault-tolerance: Not a Market

Fault-tolerance (FT) is often wrongly perceived as a market. It is a feature, one that is increasingly important in all types of computer systems from micros to mainframes. As we stated in our ½0/83 *Status Report,* we believe that the best way to examine the markets for FT computers is to examine the traditional markets for computer systems. In each of these markets it is possible to identify certain groups of applications that are increasingly moving online, demanding very high reliability. For example, the paperless factory is unlikely to become a reality without very reliable systems. Similarly, electronic mail necessitates a dependable computer system.

There are opportunities for FT vendors to challenge non-FT players in virtually every market where computers are sold today. For this reason when TNDM says that if it meets STRA in a competitive situation one of the two companies is after the wrong customer, it is largely correct. Whereas Tandem addresses very large, geographically distributed applications (typical multi-module system costs $1-5 million), STRA addresses smaller, minicomputer applications (a typical system costs $200,000-$500,000).

Transaction processing: the Largest Potential Market

Rapid growth is likely in the use of fault-tolerant transaction processing systems, particularly in revenue generating applications. First, new TP applications continue to emerge (one of the latest is the use of oil company debit cards by gas stations). Second, once installed, the use of TP systems, and therefore transaction volumes, usually grow rapidly (consider the explosive growth in the use of ATMs). Third, as usage increases, reliability and modular expandability become increasingly important factors. Infocorp, a market research firm has estimated that the transaction processing market is growing at a 35% compound annual growth rate. We believe that fault-tolerant systems will grow at an even faster 40-60% rate over the next three to five years.

Tandem Remains Well Positioned: "Better the Devil You Know . . . "

Fault-tolerant computers typically address the most critical applications within an organization. This raises a paradox. Proven products from traditional "quality" vendors, such as IBM and DEC, are presently not fault-tolerant. The new startups, on the other hand, typically have unproven products, limited marketing and support and little or no credibility in the marketplace. Tandem is the only established vendor presently marketing fault-tolerant systems and has done a remarkable job in establishing its credibility in large corporations as "*the* NonStop company". (For further discussion of Tandem see our April 8, 1983 *Basic Analysis* and subsequent *Updates*). This represents a formidable obstacle for the newer entrants to overcome (and may hamper traditional vendors' efforts to market fault-tolerant systems).

Whereas we normally expect computer companies that sell primarily to an existing customer base (base churning) to be unlikely to sustain rapid growth, the same is not true of Tandem. The "seeds" that Tandem has planted in an impressive list of major corporations worldwide are likely to provide it with considerable growth over the next few years. In many such cases, Tandem has installed pilot systems or systems to handle a single specific application. Tandem is most likely to benefit as demand for critical new applications and transaction volumes in existing applications continue to grow within these corporations.

Traditional Vendors Continue to Move Slowly

Although all the computer vendors have an ongoing commitment to improved hardware and software reliability, they have so far stopped short of moving to the radically different multiprocessor architectures embodied in fault-tolerant systems. The problem continues to be one of software, not hardware. IBM or DEC have the resources to build such a system. The problem is in adding fault-tolerance to their existing mainstream product lines in such a way as to preserve their (and their customers) enormous investment in software (to ignore this software compatibility problem and offer an incompatible new system would suggest that their mainstream products were outdated).

However, although a few vendors, e.g Data General and Datapoint, still believe the sizable investment needed to make their mainstream systems fault-tolerant is not yet warranted, most other traditional vendors are beginning to sit up and take notice. The *growing number of major orders,* such as Tandem's $400 million share of the Navy's "Splice" contract, demand their attention. Furthermore, *the cost differential between conventional and fault-tolerant systems continues to fall.* We expect most major vendors to add fault-tolerant capabilities to their systems gradually over the next few years.

IBM has embarked on R&D efforts in the fault-tolerant area, including System D, a prototype distributed transaction processing system with both high availability and modular growth, the two key features of virtually all fault-tolerant systems. We understand that this effort, which was based on Series/1 minicomputers in a ring network, has now been superceded by a newer project. We believe that IBM supports the concept of fault-tolerance, and may be working toward all its larger systems eventually being fault-tolerant. So far, however, it has only announced limited high availability options for the Series/1 and 8100 (This latter announcement was significant inasmuch as it supported the need for fault-tolerant communications and file servers in an office environment).

In 1983, *DEC* introduced its VAXcluster system—loosely coupled VAX processors sharing intelligent disk storage, the HSC 50. The system is designed eventually to provide both modular growth and high availability. However, at the present time the software (VMS V3.4) does not support many of the planned features, including recovery and data integrity, necessary to make it "fault-tolerant". DEC is decidedly vague when questioned on the likely availability of "fault-tolerant" features. Furthermore, VAXclusters are presently limited to high-end VAX processors (750 and above), which would make a fault-tolerant VAXcluster (if the software existed) expensive relative to most competitive products.

NCR has recently introduced its "Incremental Architecture," which forms the basis of a loosely coupled fault-tolerant system based on NCR's mainframe processors. *Hewlett-Packard* has already announced a number of high availability options for applications such as process control on the HP 1000, including Systemsafe/1000 and Datasafe/1000. We believe that HWP is examining the broader application of fault-tolerance to its products.

Loosely Coupled vs. Tightly Coupled: the Argument Continues

Tightly coupled systems, such as offered by Synapse and Sequoia, promise greater price/performance and flexibility than loosely coupled systems. However, the jury is still out. Two key concerns center on whether contention among processors will degrade performance in large configurations. For simplicity and maximum reliability, we lean towards the proven (i.e., by Tandem) loosely coupled approach. Tightly coupled systems bring more potential for error. For example, the single operating system or shared memory of a tightly coupled system can represent areas where a failure could crash the entire system. However, for superior price/performance, the tightly coupled systems could potentially have an edge *if the contention problems referred to in our earlier report on fault-tolerant systems can be successfully overcome.*

UNIX: A Major Opportunity for the New Players

While the traditional vendors are struggling to add fault-tolerance to their well-established systems, a new opportunity is emerging that offers startups a way to reduce some of the marketing obstacles discussed earlier. The vehicle for this is UNIX—the new "standard" operating environment developed by Bell Labs.

Although small today, the catalogue of UNIX-based applications software is likely to grow rapidly over the next few years. (For a more detailed discussion on the significance of UNIX see our 1/6/84 *Status Report*, "UNIX—Breaking Down Barriers in the Computer Industry"). UNIX has broad applicability, and mirroring the non-UNIX world, demand for fault-tolerant UNIX systems is also likely to grow rapidly.

From the perspective of the small startup, UNIX has tremendous benefits. First, it *reduces the software development effort* necessary to bring a product to market—and thereby avoids the pitfalls that Synapse has had to face. Second, it is likely to provide the vendor with a *fast growing range of applications software*. This advantage is not shared by vendors with proprietary operating systems, such as Stratus and Synapse, whose growth is likely to be constrained by the availability of third party software. Third, and perhaps most significantly, neither Tandem nor the traditional vendors (with the possible exception of AT&T) appear likely to pursue the UNIX market for fault-tolerant systems, at least in the near term. The projected explosive growth of the UNIX market in 1984-86 creates *a significant opportunity for at least one* of the UNIX-based fault-tolerant vendors.

The perceived advantages of being the first of the new breed of fault-tolerant vendors may be quickly eroded if UNIX takes off rapidly. Some of the most interesting players that will soon be shipping UNIX-based products in this area are Auragen, Computer Consoles, Sequoia and Tolerant Systems. Other players include AT&T, No-Halt (which arose out of the now defunct DOSC Inc.) and Parallel Computers. However, this area is attracting considerable interest today and the list continues to change. (Encore, the start-up founded by former Prime chief Ken Fisher, is likely to enter the market in 1985).

AT&T

AT&T recently introduced a fault-tolerant machine, the 3B20D. Priced around $400,000, this machine is essentially a redundant version of its 3B20 minicomputer. Although marketed by the might of AT&T, we find that the 3B20D is one of the least interesting of the fault-tolerant systems available today. First, its relatively high price suggests the system should be applicable for large scale applications and less interesting to OEM customers. Nevertheless, lacking an experienced computer marketing organization or a large installed base of customers, AT&T appears to have decided to market this system primarily through OEMS. There is little or no application software *today* for large scale UNIX based transaction processing applications, which will be considerably more of a factor for AT&T than small startups whose growth will parallel the growth in UNIX software. Whereas most other UNIX-based fault-tolerant vendors have made significant modifications within UNIX to handle commercial transaction processing applications, AT&T's vanilla version of UNIX is unsuitable for transaction processing applications.

Auragen

Auragen changed its name from Parallel Computer Systems on April 1, 1983 to avoid confusion with Parallel Computers Inc., of Santa Cruz, CA (which is headed by Charlie Ryle, formerly VP Marketing at Tandem). About six to twelve months behind schedule, we understand Auragen now has three orders (including one from a Tandem OEM), one system in Beta test and has shipped a number of additional systems to its European partner, Nixdorf.

An Auragen System 4000 comprises from two to 32 loosely-coupled clusters. A two cluster system has an entry price of $138,000. (A non-fault-tolerant single cluster is also available at $68,000). The product is targeted at large transaction processing applications.

Each cluster includes three Motorola 68010 microprocessors tightly coupled with its own memory (up to 8Mb) and operating system (Auros—Auragen's adaptation of UNIX System III). Two micros share the cluster's applications workload, while the third, the executive processor, handles core operating systems functions including fault-tolerance. A cluster can also include other micros to support terminals and disks. Clusters are coupled together across a very high speed (dual 16Mb/sec) bus. (For a comparative description of the approaches used by Tandem, Stratus and Synapse see our ½0/83 *Status Report).*

Every program running in an Auragen system has a backup copy on standby on another cluster. Whenever a message is input, a duplicate copy is sent to the backup. The backup also keeps count of each time the primary application processor writes to a disk. If a failure occurs (detected by the absence of an "I'm alive" signal), the backup processor takes over and begins to reprocess the input message. However, it does not necessarily write data to disk. The count tells the backup how many writes the primary had initiated before the failure occurred. Therefore to avoid a double update, the backup only actually writes to the disk after it has discarded writes already effected by the primary. The recovery delay after a fault could be considerably longer than on some of the alternative approaches—perhaps 5-10 seconds.

One of the risks of the Auragen approach we feel, and a factor in the delays it has faced, is its relatively complex approach to fault-tolerance. The project is already falling behind schedule. (Partly as an attempt to regain some lost ground, Auragen has recently shifted from end-user to OEM marketing).

Computer Consoles

Computer Consoles (See our 6/22/83 *Basic Analysis* and subsequent *Updates)* is a leading supplier of fault-tolerant systems to the telephone industry, with 1983 revenues of approximately $100 million. It has recently added a range of UNIX-based systems to its telephone industry products. These include a 32-bit supermicro (the Power 5/20), a fault-tolerant supermini (the Power 5/55) and a sophisticated office automation system for UNIX environments (OfficePower). Revenues from these new products reached $5 million in 1983 and are projected to grow rapidly in 1984 and 1985.

The fault-tolerant 5/55 was launched last August, probably a little too early. We believe that first production shipments are now underway, slightly behind CCS' original schedule. Early customers include Hale and Doore, British Telecom, Rochester Telephone and Merrill Lynch. Following some independent benchmark studies, CCS appears to be pleased with the performance of the product. Its architecture has some unique characteristics which may make it particularly suitable for applications with heavy information retrieval requirements, and less suitable for update-intensive applications such as electronic banking. (The 5/55's architecture is described in our 6/22/83 *Basic Analysis).* For this reason, we believe that the federal government may represent one of the larger potential markets for the 5/55.

Parallel Computers

Parallel has recently introduced a $75,000 fault-tolerant system. The Parallel 300 Model 30, which is targeted at "operational information system applications". With a low price (its price for a *redundant* configuration is one half that of its nearest competitors, Tolerant and Auragen), Parallel is targeting the OEM market. However, the system only delivers the effective power of a single Motorola 68010 processor (using an architecture somewhat similar to Stratus), considerably less than its computers, most notably, Tolerant Systems. Even more significantly, like the AT&T product, the Parallel system also does not possess the modular expandability necessary for many transaction processing applications—it is a much simpler, fault-tolerant minicomputer.

Nevertheless, we believe that Parallel's product is likely to fill a significant need fpr simpler, lower priced but *reliable* systems in many traditional minicomputer markets.

Sequoia

Although we had recently all but written off Sequoia as a potential high-flyer, we are now far less negative about its prospects. Despite having one of the most innovative fault-tolerant architectures that we have seen, Sequoia has focused little on marketing—vital in this increasingly crowded area. A combination of problems led to the departure of two founders in 1983, including former president Allen Burgess.

However, the company appears now back on track. We are impressed with the new management team, headed by Warren Tyler, former president of Data Terminal Systems. Jack Stiffler, who has considerable experience in the design of fault-tolerant systems for the space program, is an original founder. Tyler has added Phil Bernstein (formerly an associate professor of computer science at Harvard, an expert in operating systems and database, and codeveloper of CCA's Model 204 database system) as VP of Software, Herb Spivak (formerly with Prime and Honeywell) in charge of manufacturing, and two former Tandem marketing executives, Al Deimaggi and Bruce Karlson. The product's technical problems appear to have been resolved and Sequoia is now close to a deliverable product. Delays at many of the other startups mean that Sequoia has not lost much ground from its problems in 1983. Sperry has recently invested $2 million into Sequoia, and may be planning to market its product to the federal government.

Sequoia's system combines many of the key features of the Stratus and Synapse approaches described in our January 20, 1983 *Status Report*. Like Stratus, Sequoia uses a comparator approach—"hardware based fault-tolerance" as it has come to be known. However, whereas in a Stratus system modules are loosely coupled together, Sequoia has adopted a tightly coupled (shared memory) approach similar to Synapse's. The net result, however, could be a *more expensive* solution than some of the other approaches.

Tolerant Systems

Despite being one of the later entrants (it was founded in July 1982, with Fred Adler as the primary backer), Tolerant has made rapid progress, having learned from the mistakes of others. It has already shipped its first (though not yet fault-tolerant) UNIX-based system to General Instrument. Tolerant has the potential to move quickly into a prominent position, with an exciting product and an established salesforce already in the field (mainly ex Tandem and Stratus).

We are particularly impressed with Tolerant's strategy, which is geared to limit risks more effectively than most of its competitors. Its choice of a loosely coupled fault-tolerant architecture provides a number of benefits. First, it is a more proven technique than tightly coupled systems. Second, it allows Tolerant to enter the market with a competitive system, adding fault-tolerance later. (It does not have to deliver everything on day one). Tolerant has also hired individuals experienced in the development and marketing of these systems, including some from Tandem (most notably Jim and Shirley Henry, who were formerly Manager of Competitive Marketing and Manager of Product Marketing at Tandem) and even from newer competitors such as Synapse.

Based on the powerful National 16000 microprocessor family, Tolerant will be one of the first vendors to deliver hardware based on the new generation of full 32-bit microprocessors. (Vendors using 68000 microprocessors are likely to have to redesign their hardware to move to the full 32-bit 68020, expected in 1985). The Tolerant system is based on System Building Blocks (SBBs) that are loosely coupled together by two coaxial cables. Each SBB will include two NS32032 microprocessors (one for applications processing and one for operating systems functions) and up to 16Mb of memory.

Early benchmarks indicate that the system should offer significantly greater price/performance than fault-tolerant systems based on the Motorola 68000 family. The system will be priced aggressively (Tolerant claim $25,000 per MIP) and marketed primarily to OEMs. Despite its late start, Tolerant has already surpassed Synapse, with over $7 million of orders now signed.

Like Tandem, Tolerant realizes that fault-tolerance is an increasingly necessary but insufficient condition for success in the transaction processing market. It has therefore invested heavily in software development, and is building a comprehensive set of development tools geared to help its OEM customers to rapidly build fault-tolerant transaction processing applications in a UNIX environment.

Prices of Companies Mentioned:

Amdahl Corp. ($12⅝)
AT&T[2] ($15¾)
Computer Consoles ($18⅛)
Data General[2] ($43⅝)
Datapoint Corp. ($22¾)
Digital Equipment ($87⅞)
Dow ($37⅜)
Dupont (Conoco)[2] ($47⅛)
General Electric ($52½)
General Instrument ($21⅞)
Hewlett Packard ($33⅝)
IBM[2] ($107⅝)
Merrill Lynch ($22¾)
Mobil[2] ($28½)
Motorola ($106⅝)
NCR Corp. ($26)
Rochester Telephone ($28⅛)
Sperry Corp[2,3] ($38)
Stratus Computer ($10¼)
Tandem[1,2] ($19¾)
Trilogy Ltd. ($2⅜)
Wang[2] ($25⅞)

[1]Paine, Webber, Jackson & Curtis, Inc. and/or Rotan Mosle Inc., affiliated corporations of Paine Webber Mitchell Hutchins Inc., makes a market in this security.

[2]Blyth Eastman Paine Webber Inc. and/or Rotan Mosle Inc., affiliated corporations of Paine Webber Mitchell Hutchins Inc., has acted in an investment banking capacity for this company.

[3]An officer of Paine, Webber, Jackson & Curtis Inc., Paine Webber Mitchell Hutchins Inc., Blyth Eastman Paine Webber Inc. or Rotan Mosle Inc. is a director of the company being reported upon.

cc: Dept mgrs

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Status
Report

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Tandem Computers

$18¾ (OTC—TNDM) 52-week range: $13-40¼

Rating: Unattractive

FY 9/30	1984	1985	1986E
Q1	$0.24	$0.34	$0.19
Q2	0.05	0.16	0.08
Q3	0.23	0.06	0.24
Q4	0.29	0.27	0.40
Year	0.81	0.82	0.90
P/E	—	22.8	20.8
Div	—	—	—
Yield		—	—
Secular Growth Rate			15-20%

Summary

Tandem is a threatening competitor for IBM in the on-line transaction processing (OLTP) market, a market traditionally dominated by IBM mainframes. So significant is the threat that IBM has mounted a determined effort to arrest the progress Tandem has been making in large, previously "all blue" IBM accounts. While we are still confident that Tandem has sufficient competitive advantage to sustain long-term growth of 15-20%, we remain cautious over the near-term earnings outlook. First, investors may be reading too much into the strength in demand seen in the final quarter of fiscal 1985 (ended September), especially after an unusually weak third quarter. Second, as we had anticipated, IBM is going ahead with its plans to market the Stratus product *now*. At the very least, this should extend Tandem's selling cycle. Furthermore, we believe that Digital Equipment is also likely to make a significant push into the OLTP marketplace within the next six months. Third, Tandem's seasonally weak March quarter is always a worrisome one. Moreover, the anticipation of new products including "Check" and "Nonstop EXP," in the March quarter could further impact near-term order rates. With the stock selling at 20 times our below consensus fiscal 1986 EPS estimate of $0.90, we believe the possibility of another earnings disappointment should not be ruled out. Tandem consequently remains rated unattractive (4) and is likely to underperform over the next six months.

"Check" But Not "Checkmate"

Already in alpha-test and scheduled to go into beta-test in December, Check is Tandem's first ECL (Emitter Coupled Logic) machine. We expect the product initially to deliver 40-50% greater performance than Tandem's current high-end machine, the Nonstop TXP. Check consists of a two-board CPU, compared with four boards in the TXP. Deliveries are expected to begin in March.

Strictly speaking, Check uses ECL circuitry on chip, but TTL off chip. The product is based upon the Motorola 2800 ECL gate array family (the same family used in the Data General MV20000 announced in mid-November). Development was begun in October 1983. Significantly, Tandem has benefited from a $5-6 million investment in its own prototype facility which has enabled the company to achieve 2- to 3-week turnaround on ECL chips instead of 12 weeks from Motorola. Management estimates that this has cut 6 to 12 months off the development time for Check.

Check +, a version at least 100% faster than TXP, is expected to be rolled out less than a year after the original Check introduction. However, we now believe that Checkmate, a new low-end, CMOS gate-array implementation of the NonStop architecture, will not be introduced until 1987—considerably later than we had anticipated. In the meantime, we expect TNDM to introduce another repackaging of existing technology in the mid-range of its product line.

NonStop EXP

We believe that Tandem's product line will eventually be broken down into three product categories:

- TX—High-performance, *computer environment systems.*
- *EX—Medium-performance, copier environment systems.*

and possibly:

- *OX—compact, office environment machines.*

Like the EXT, Tandem's forthcoming EXP system is not a new processor but a repackaging of existing processor technology with cost-effective peripherals that can be used outside the traditional computer room environment (see Table 1). Most significantly, EXP will move the perform-

Table 1

Systems Offerings by Environment

Environment	Current Offering	Offerings by 1987
Computer Room	TXP	Check; TXP
Copier Environment	EXT	EXT; EXP
Office Environment	None	Checkmate

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Table 2

Tandem Computers
Quarterly Income Statement Model
(Dollars in millions, except percentages and per share data)

Revised 11/22/85

	1982A	1983A Q1	1983A Q2	1983A Q3	1983A Q4	1983A Year	1984A Q1	1984A Q2	1984A Q3	1984A Q4	1984A Year
Product	$272.59	$81.76	$82.31	$94.55	$101.51	$360.13	$108.47	$91.22	$119.06	$129.85	$440.61
Service	$39.55	$12.38	$13.70	$15.74	$16.34	$58.15	$17.90	$20.0[illegible]	$22.86	$23.24	$84.01
Total Revenues	$312.14	$94.14	$96.01	$110.29	$117.85	$418.28	$126.37	$111.24	$141.93	$153.09	$532.62
Costs and Expenses:											
Cost of Revenues	$109.31	$37.96	$37.86	$45.12	$47.78	$169.71	$50.44	$47.25	$57.79	$63.34	$218.81
Product development	$33.64	$9.00	$9.81	$9.96	$10.41	$39.17	$10.85	$12.85	$13.51	$15.30	$52.51
Marketing, G&A	$128.49	$35.55	$37.95	$41.56	$45.58	$160.64	$48.21	$49.13	$56.28	$56.58	$210.20
Total Expenses	$271.44	$82.50	$85.61	$96.64	$103.77	$368.52	$109.49	$109.23	$127.58	$135.22	$481.52
Operating Income	$40.71	$11.64	$10.40	$13.65	$14.08	$49.77	$16.88	$2.01	$14.34	$17.88	$51.10
Interest, Net	$6.03	$0.05	($0.18)	$0.25	$0.62	$0.73	$1.08	$1.14	$1.24	$1.72	$5.18
Pretax Income	$46.74	$11.68	$10.22	$13.90	$14.70	$50.50	$17.95	$3.15	$15.59	$19.60	$56.28
Tax rate	0.36	0.39	0.37	0.39	0.40	0.39	0.44	0.37	0.41	0.39	0.41
Taxes	$16.88	$4.56	$3.77	$5.46	$5.91	$19.69	$7.90	$1.17	$6.34	$7.67	$23.08
Net Income	$29.86	$7.13	$6.45	$8.44	$8.79	$30.81	$10.05	$1.97	$9.25	$11.93	$33.20
Shares outstanding	39	40	41	41	41	41	42	42	41	41	41
EPS	$0.76	$0.18	$0.16	$0.21	$0.21	$0.76	$0.24	$0.05	$0.23	$0.29	$0.81
DISC										$0.24	$0.24
EPS incl. DISC										$0.53	$1.05
Growth rates (% year-year)											
product revenue	46	NA	NA	NA	NA	32	33	11	26	28	25
service revenue	84	NA	NA	NA	NA	47	45	46	45	42	44
Total revenue	50	33	30	38	35	34	34	16	29	30	27
EPS	6	-11	0	7	1	-1	36	-70	10	36	7
Growth rates (% Qtr-Qtr)											
Revenue		8	2	15	7		7	-12	28	8	
EPS		-17	-10	30	4		12	-80	377	29	
Ratios (%):-											
Gross Margin	64.98	59.68	60.57	59.09	59.46	59.67	60.09	57.53	59.28	58.62	58.92
Product dev:sales	10.78	9.56	10.21	9.03	8.83	9.37	8.59	11.55	9.52	9.99	9.86
Mktg. G&A:sales	41.16	37.76	39.52	37.68	38.68	38.40	38.15	44.17	39.66	36.96	39.46
Operating Margin	13.04	12.36	10.83	12.38	11.95	11.90	13.36	1.80	10.11	11.68	9.59

	1985A Q1	1985A Q2	1985A Q3	1985A Q4	1985A Year	current quarter 1986E Q1E	1986E Q2E	1986E Q3E	1986E Q4E	1986E Year	[illegible]
Product	$134.14	$120.09	$116.87	$144.02	$515.11	$136.82	$127.29	$144.92	$168.14	$577.17	[illegible]
Service	$25.52	$26.40	$27.29	$29.81	$109.02	$30.62	$32.21	$33.57	$35.78	$132.18	[illegible]
Total Revenues	$159.65	$146.49	$144.16	$173.83	$624.13	$167.44	$159.50	$178.49	$203.92	$709.34	[illegible]
Costs and Expenses:											
Cost of Revenues	$62.02	$57.71	$56.12	$64.30	$240.15	$62.79	$62.21	$66.04	$75.45	$266.48	[illegible]
Product development	$15.13	$17.08	$18.03	$21.35	$71.58	$21.00	$21.50	$22.00	$24.00	$88.50	[illegible]
Marketing, G&A	$60.00	$62.00	$69.48	$70.86	$262.33	$72.00	$72.00	$75.00	$78.00	$297.00	[illegible]
Total Expenses	$137.14	$136.79	$143.63	$156.50	$574.06	$155.79	$155.71	$163.04	$177.45	$651.98	[illegible]
Operating Income	$22.51	$9.70	$0.54	$17.33	$50.08	$11.65	$3.80	$15.45	$26.47	$57.36	[illegible]
Interest, Net	$1.89	$1.57	$1.30	$1.51	$6.27	$1.50	$1.50	$1.50	$1.50	$6.00	[illegible]
Pretax Income	$24.40	$11.28	$1.84	$18.84	$56.35	$13.15	$5.30	$16.95	$27.97	$63.36	[illegible]
Tax rate	0.43	0.39	NM	0.41	0.39	0.40	0.40	0.40	0.40	0.40	[illegible]
Taxes	$10.37	$4.44	($0.55)	$7.72	$21.98	$5.26	$2.12	$6.78	$11.19	$25.34	[illegible]
Net Income	$14.03	$6.84	$2.39	$11.12	$34.37	$7.89	$3.18	$10.17	$16.78	$38.02	[illegible]
Shares outstanding	41	42	42	42	42	42	42	42	42	42	[illegible]
EPS	$0.34	$0.16	$0.06	$0.27	$0.82	$0.19	$0.08	$0.24	$0.40	$0.90	[illegible]
DISC											
EPS incl. DISC											
Growth rates (% year-year)											
product revenue	24	32	-2	11	15	2	6	24	17	12	[illegible]
service revenue	43	32	19	38	30	20	22	23	20	21	[illegible]
Total revenue	26	32	2	14	17	5	9	24	17	14	[illegible]
EPS	41	344	-75	-8	2	-45	-53	325	48	10	[illegible]
Growth rates (% Qtr-Qtr)											
Revenue	4	-8	-2	21		-4	-5	12	14		
EPS	16	-52	-65	369		-30	-60	220	63		
Ratios (%):-											
Gross Margin	61.15	60.60	61.07	63.01	61.52	62.50	61.00	63.00	63.00	62.43	[illegible]
Product dev:sales	9.47	11.66	12.50	12.28	11.47	12.54	13.48	12.33	11.77	12.48	[illegible]
Mktg. G&A:sales	37.58	42.32	48.20	40.76	42.03	43.00	45.14	42.02	38.25	41.87	[illegible]
Operating Margin	14.10	6.62	0.37	9.97	8.02	6.96	2.38	8.65	12.98	8.09	13.25

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ance of TXP into a "copier room" system. EXP will support both NonStop II (the same as EXT) and TXP processor boards in the same cabinet. We expect the machine to be introduced at the same time as or soon after the Check announcement. Besides using new peripherals, the EXP will also feature a compact new I/O board which makes extensive use of CMOS gate-arrays and replaces at least five boards in Tandem's previous system.

More Aggressive Pricing: More Perceived Than Real?

When IBM began to distribute the Stratus Computer STRA product, IBM chose to price the S/88 higher than its manufacturer had done. When it recently raised the S/88 to "general availability" IBM chose to tag it at the same price charged by STRA. However, IBM charges separately for software, which is bundled in the STRA price.

Partly in response to this, we believe, Tandem management recently informed us that with the new products, we will see *a significant change in TNDM's pricing structure.* Basically, we expect TNDM to cut hardware prices and raise software prices. Nevertheless, this could be perceived as more aggressive pricing similar to what DEC has succeeded with for the MicroVAX II, despite its high software prices.

Tandem's Pricing Problem

Simply put, Tandem has one price. Since its whole philosophy is based upon a modular approach to reach of given level of performance instead of a discrete set of products spanning a performance range, price changes can have a dramatic impact at Tandem. For example, Tandem clearly underpriced the TXP when it was introduced in late 1983. Since the TXP offered almost three times the performance of NonStop II for only a 30% higher price, Tandem cut its price/per transaction/per second of processing power so drastically that it shot itself in the foot: In the following quarter TNDM had an earnings accident.

Similar problems plagued the EXT introduction and that of the new Guardian 90 operating system, which provided a substantial boost in capacity—thus extending the life of existing hardware installed. Therefore we are unlikely to see a dramatic change in TNDM's *overall* pricing with the Check introduction. Furthermore, our recent dealings with management indicate that TNDM's salesforce already believe the price is competitive, i.e., that the problem (demand) lies elsewhere. Consequently, barring the possibility of considerably more aggressive pricing from IBM and Stratus we expect Tandem to be able to deliver on its promise to keep gross margins over 60% over the next 12 to 18 months at least.

The Demand Side of the Equation

We believe that three key factors will affect demand for Tandem systems over the course of the next 12 months:

- The IBM/Stratus Marketing push.
- The economy.
- New applications.

Can IBM Freeze the Market?

IBM is serious. Its Customer Announcement letter for the System 88 (IBM's name for the Stratus product line) opens by saying that S/88 is "its *mid-range* fault tolerant offering." Other products are clearly planned. IBM is clearly concerned about the initial perception that the S/88 was a temporary, stopgap measure. The evidence supports a concerted effort by IBM to hit TNDM. Specifically, industry consultant ITOM International indicates that IBM is:

- Pricing S/88 aggressively (equivalent to Stratus pricing).
- Putting in place a comprehensive support structure to support local IBM salesmen.
- Lining up ISVs (third party software vendors) and may even market some software directly.
- Considering adding VARs/VADs to participate in the S/88 program.

Why Is IBM So Intent on Stopping Tandem?

Simply put:

1) IBM does not like to lose, especially in its major accounts. (TNDM claims 21 of the top 25 domestic banks are its customers, as well as every major automotive manufacturer in the U.S. and many in Europe).
2) It recognizes H/A (high availability) as a growing sensitivity among its loyal customers. According to ITOM International, IBM's top 75 accounts have increased their expectations of overall systems availability from 98.3% in 1982 to 99.5% in 1985. (For further information, see our original Fault Tolerant *Status Report* dated January 20, 1983.)
3) In general, Tandem's solution to the needs of large-scale OLTP applications is, we believe, clearly superior to IBM's traditional mainframe approach and is still probably one of the industry's "best kept secrets." (What customer, given a cost advantage by using TNDM in a critical on-line application, is going to do his competitors the favor of letting them know how he did it?)
4) *OLTP is one of the most important markets in the computer industry.* Instead of updating information in batch fashion, companies are increasingly anxious to have it kept up to date on a minute-by-minute basis. Furthermore, new applications such as ATM and POS could not exist without complex on-line support systems. OLTP is effectively replacing use of the batch systems on which IBM mainframes evolved.
5) *IBM does not have an effective solution.* OLTP applications have very different needs from those of the batch systems for which IBM mainframes were originally designed. They need:

- Continuous availability (fault tolerance).
- Modular expansibility (The ability to add processing capacity in small increments).
- Networking and distributed database.
- Security.
- Low cost per transaction.
- Raw processing power. (Mainframe processing power is not growing fast enough to handle the needs of an increasing number of large on-line applications.)

IBM's customers have become increasingly aware of the limitations of a traditional mainframe approach to solving these problems, which has led to the growing recognition of TNDM among major IBM accounts.

What Can/Will IBM Do about It?

IBM should never be underestimated. IBM's biggest advantage in OLTP has nothing to do with its products. Simply put, OLTP applications are so important to the customers that implement them that vendor selection is *the* dominant issue. The computer system is an increasingly vital element of a company's product differentiation—as firms such as Federal Express, GM and Citibank will clearly attest.

Therefore, IBM does not (does it ever?) have to have the best solution. However, the user community is clearly in a quandary. IBM's early attempts at high availability (on the Series 1 and 8100 series) failed miserably. While standard database offerings such as DB2 and IMS increasingly offer high-availability options, performance is a never ending issue. (Many medium-sized OLTP applications can see a day coming when a single mainframe's capacity will not be able to keep up with the explosive growth in transaction volumes.) IBM's solution for the biggest on-line applications—TPF 2—is extraordinarily difficult to implement, and thus can only be attempted by IBM's largest and most loyal customers (Even some of those have found TPF 2 far more than they bargained for).

Although we would be the last to claim that STRA's solution is in any way comparable to that of Tandem for sophisticated OLTP applications, it provides IBM with some answers. First, it allows the IBM salesmen to claim, "We have that too," when talking about fault tolerance. Second, by "front-ending" an IBM mainframe system, the STRA product could *eventually* address many of the problems that the IBM mainframe strategy currently faces. Third, (while we strongly disagree) Stratus is *perceived* to have a superior solution to Tandem. The Stratus product has momentum—it's "hot."

In the long term, we believe IBM will add fault-tolerant capabilities to its mainframe family in an incremental fashion, and will introduce fault-tolerant versions of its smaller systems. However, for the first time it has at least a superficially convincing argument against Tandem. The impact of the IBM/STRA program is consequently likely to be a major negative for Tandem in fiscal 1986.

Hopes for a Strong Second Half

At its recent analyst meeting, management indicated that it remains cautious for the first half of fiscal 1986, and that aggregate performance for the third and fourth quarters of its fiscal 1985 is a better representation of the current situation than the surprising strength seen in the fourth quarter alone.

We remain concerned over the near-term outlook, especially for the second and third quarters of fiscal 1986. (The first quarter should benefit from normal seasonal factors.) Further, new product introductions can cause as many problems as they solve for Tandem, due to the pricing issue discussed earlier. We consequently project EPS of $0.90 for fiscal 1986, with profits for the first half down 46% and the second half up 94% over the year-earlier periods.

Prices of Companies Mentioned:

Citicorp (CCI—$46)
Data General (DGN—$42⅛)
Digital Equipment (DEC—$116⅛)
Federal Express (FDX—$51¾)
General Motors (GM—$70¾)
Int'l. Business Machines (IBM—$139)
Motorola (MOT—$35½)
Stratus (STRA—$21½)

PaineWebber Incorporated and/or Rotan Mosle Inc., an affiliated corporation of PaineWebber Incorporated, has acted in an investment banking capacity for Citicorp.

PaineWebber Incorporated and/or Rotan Mosle Inc., an affiliated corporation of PaineWebber Incorporated, makes a market in Tandem and Stratus.

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1/3/1
02742821
Signal delay in distributed RC tree networks.
Chengson, D.; Frazao, C.; Wang, H. W.; Billett, B.
Tandem Computers Inc, Cupertino, CA, USA
Conference Title: 1988 IEEE International Symposium on Circuits and Systems, Proceedings
Conference Location: Espoo, Finl Conference Date: 1988 Jun 7-9
E.I. Conference No.: 11923
Source: Proceedings - IEEE International Symposium on Circuits and Systems. Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (cat n 88CH2458-8) Piscataway, NJ, USA. p 2835-2837
Publication Year: 1988
CODEN: PICSDI ISBN: 951-721-239-9

1/3/2
02645383 Monthly No: EIM8809-049275
DESIGN METHODOLOGY FOR SYSTEM CORRECTNESS: LESSONS FROM THE TANDEM NONSTOP CLX.
Fu, Peter L.
Tandem Computers Inc, Cupertino, CA, USA
Conference Title: Digest of Papers - Compcon Spring 88: Intellectual Leverage, Thirty-Third IEEE Computer Society International Conference.
Conference Location: San Francisco, CA, USA Conference Date: 1988 Feb 29-Mar 4
E.I. Conference No.: 11490
Source: 1988. Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (cat n 88CH2539-5), Piscataway, NJ, USA p 525-530
Publication Year: 1988
ISBN: 0-8186-0828-5

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02645382 Monthly No: EIM8809-049274
BUILT-IN-SELF-TEST FOR THE TANDEM NONSTOP CLX PROCESSOR.
Garcia, David J.
Tandem Computers Inc, Cupertino, CA, USA
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Conference Location: San Francisco, CA, USA Conference Date: 1988 Feb 29-Mar 4
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Source: 1988. Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (cat n 88CH2539-5), Piscataway, NJ, USA p 520-524
Publication Year: 1988
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1/3/4
02645381 Monthly No: EIM8809-049273
HIGHLY INTEGRATED, FAULT-TOLERANT MINICOMPUTER: THE NONSTOP CLX.
Lenoski, Daniel E.
Tandem Computers Inc, Cupertino, CA, USA

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Conference Location: San Francisco, CA, USA Conference Date: 1988 Feb 29-Mar 4
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Source: 1988. Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (cat n 88CH2539-5), Piscataway, NJ, USA p 514-519
Publication Year: 1988
ISBN: 0-8186-0828-5

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02645365 Monthly No: EIM8809-049257
DESIGN CONSIDERATIONS IN REPLICATED DATABASE SYSTEMS FOR DISASTER PROTECTION.
Lyon, Jim
Tandem Computers Inc
Conference Title: Digest of Papers - Compcon Spring 88: Intellectual Leverage, Thirty-Third IEEE Computer Society International Conference.
Conference Location: San Francisco, CA, USA Conference Date: 1988 Feb 29-Mar 4
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Publication Year: 1988
ISBN: 0-8186-0828-5

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02645363 Monthly No: EIM8809-049255
NONSTOP SQL - A DISTRIBUTED RELATIONAL DBMS FOR OLTP.
Holbrook, Robert
Tandem Computers Inc
Conference Title: Digest of Papers - Compcon Spring 88: Intellectual Leverage, Thirty-Third IEEE Computer Society International Conference.
Conference Location: San Francisco, CA, USA Conference Date: 1988 Feb 29-Mar 4
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Publication Year: 1988
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THERMAL CHARACTERIZATION OF A 149-LEAD VLSI PACKAGE WITH HEATSINK.
Wesling, Paul B.
Tandem Computers Inc, Cupertino, CA, USA
Conference Title: Fourth Annual IEEE Semiconductor Thermal and Temperature Measurement Symposium, Proceedings 1988.
Conference Location: San Diego, CA, USA Conference Date: 1988 Feb 10-12
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Publication Year: 1988

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02639541 Monthly No: EI8809082151
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Stenzel, William J.
Tandem Computers Inc, Cupertino, CA, USA
Source: EDN v 33 n 9 Apr 28 1988 p 195-200, 202
Publication Year: 1988
CODEN: EDNSBH ISSN: 0012-7515

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02635925 Monthly No: EI8809086107
COMPARISON OF ABRASION-RESISTANT MATERIALS FROM THE USER'S VIEWPOINT.
Tweet, David E.
Tandem Products Inc, Bloomington, MN, USA
Source: Bulk Solids Handling v 8 n 2 Apr 1988 p 239-243
Publication Year: 1988
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02594996 Monthly No: EIM8806-033244
INDUSTRY APPLICATIONS FOR NETWORK SERVICES.
Clemson, Gaye
Tandem Computers Inc, Cupertino, CA, USA
Conference Title: Proceedings of the National Communications Forum.
Conference Location: Rosemont, IL, USA Conference Date: 1986 Sep 29-Oct 1
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Source: Proceedings of the National Electronics Conference v 40 n 2. Publ by Natl Electronics Conference Inc, Oak Brook, IL, USA p 952-955
Publication Year: 1986
CODEN: PNECAC ISSN: 0077-4413
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02581485 Monthly No: EIM8805-029436
SUCCESSFUL PRODUCT MANAGEMENT IN A DYNAMIC TECHNOLOGY ENVIRONMENT.
Jolls, Robert T.
Tandem Computers, Cupertino, CA, USA
Conference Title: Proceedings of the National Communications Forum.
Conference Location: Rosemont, IL, USA Conference Date: 1986 Sep 29-Oct 1
E.I. Conference No.: 11141
Source: Proceedings of the National Electronics Conference v 40 pt 1. Publ by Professional Education Int Inc, USA p 270-271
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02553754 Monthly No: EIM8803-016395
FAULT TOLERANT ARCHITECTURES THE TANDEM APPROACH.
Rasala, Edward J.
Tandem Computers, Cupertino, CA, USA
Conference Title: Proceedings of the National Communications Forum.
Conference Location: Rosemont, IL, USA Conference Date: 1985 Oct 7-9

E.I. Conference No.: 10852
Source: Proceedings of the National Electronics Conference v 39. Publ by Professional Education Int Inc p 740-745
Publication Year: 1985
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02314212 Monthly No: EI8709088396
DISTRIBUTED COMPUTER SYSTEMS: FOUR CASE STUDIES.
Gray, James N.; Anderton, Mark
Tandem Computers Inc, Cupertino, CA, USA
Source: Proceedings of the IEEE v 75 n 5 May 1987 p 719-726
Publication Year: 1987
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02260060 Monthly No: EIM8707-046610
ACCEPTING DIRECT CONTROL IN MANUFACTURING.
Joyce, Richard
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Conference Title: Official Proceedings of the Second International IMS '86 Conference.
Conference Location: Boston, MA, USA Conference Date: 1986 Oct 27-31
E.I. Conference No.: 09714
Source: Publ by Intertec Communications Inc, Ventura, CA, USA p 313-319
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02258672 Monthly No: EIM8707-045064
ONLINE STOCK TRADING SYSTEMS: STUDY OF AN APPLICATION.
Sammer, Harald W.
Tandem Computers Inc, Frankfurt, West Ger
Conference Title: Digest of Papers - COMPCON Spring 87: Thirty-Second IEEE Computer Society International Conference.
Conference Location: San Francisco, CA, USA Conference Date: 1987 Feb 23-27
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Source: Digest of Papers - IEEE Computer Society International Conference 32nd. Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (Cat n 87CH2409-1), Piscataway, NJ, USA p 161-162
Publication Year: 1987
CODEN: DCSIDU ISBN: 0-8186-0764-5

1/3/16
02258667 Monthly No: EIM8707-045059
INTEGRATION OF OPTICAL DISK INTO MAINFRAME SYSTEM SOFTWARE.
Lowenthal, L. Bruce
Tandem Computers Inc, Cupertino, CA, USA
Conference Title: Digest of Papers - COMPCON Spring 87: Thirty-Second IEEE Computer Society International Conference.
Conference Location: San Francisco, CA, USA Conference Date: 1987 Feb 23-27
E.I. Conference No.: 09694
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Publication Year: 1987
CODEN: DCSIDU ISBN: 0-8186-0764-5

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02258665 Monthly No: EIM8707-045057
COBOL 1985 LANGUAGE.
Nelson, Donald F.
Tandem Computers Inc, Cupertino, CA, USA
Conference Title: Digest of Papers - COMPCON Spring 87: Thirty-Second IEEE Computer Society International Conference.
Conference Location: San Francisco, CA, USA Conference Date: 1987 Feb 23-27
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Publication Year: 1987
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02129617 Monthly No: EIM8611-075808
PATTERNING OF THE POLYIMIDE USING AN ERODABLE MASK.
Garcia, Socorro; Mathur, Vishnu
Tandem Computers Inc, Cupertino, CA, USA
Conference Title: 1986 Proceedings - Third International IEEE VLSI Multilevel Interconnection Conference.
Conference Location: Santa Clara, CA, USA Conference Date: 1986 Jun 9-10
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Publication Year: 1986

1/3/19
02109134 Monthly No: EIM8608-051724
WHY DO COMPUTERS STOP AND WHAT CAN BE DONE ABOUT IT?
Cray, Jim
Tandem Computers Inc, Cupertino, CA, USA
Conference Title: Fifth Symposium on Reliability in Distributed Software and Database Systems - Proceedings.
Conference Location: Los Angeles, CA, USA Conference Date: 1986 Jan 13-15
E.I. Conference No.: 08269
Source: Proceedings - Symposium on Reliability in Distributed Software and Database Systems 5th. Publ by IEEE, New York, NY, USA. Available from IEEE Service Cent (Cat n 86CH2260-8), Piscataway, NJ, USA p 3-12
Publication Year: 1986
CODEN: PRDSEJ ISBN: 0-8186-0690-8

1/3/20
02095549 Monthly No: EIM8606-036199
CALIBRATION OF A SEMI-ANECHOIC CHAMBER FOR FCC OPEN FIELD SITE RADIATED

EMISSIONS MEASUREMENTS.
Pettit, G. S.; Grebenkemper, C. J.
Tandem Computers Inc, Santa Clara, CA, USA
Conference Title: IEEE 1985 International Symposium on ELectromagnetic Compatibility, Symposium Record.
Conference Location: Wakefield, MA, USA Conference Date: 1985 Aug 20-22
E.I. Conference No.: 07907
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Publication Year: 1985

SWIS 2-262

Prudential-Bache Securities

Tandem Computers Inc.

Software House Survey

- Software houses pleased with Tandem products but uncertain of its commitment to cooperative marketing.
- Benefits to revenues and earnings of larger software library 12 months in future.

Carol E. Muratore, CFA
Susan J. Griffiths

Research

June 18, 1985

TNDM (16 1/8) -- OTC

Earnings Per Share Fiscal Year Ending 9/84	9/85E	9/86E	P/E 1985E	Ind. Div.	Yield	Opinion N	Opinion L	Shares O/S (mil.)	52-Week Range
$0.81	$0.97	$1.26	16.6	--	--	3	3	42.2	29-13

DJIA: 1301.76 Priced as of the close, June 17, 1985.
S&P 400: 187.04

SUMMARY AND CONCLUSION

Even with Tandem's limited software library in fiscal 1984, 50% of total revenues were generated from new applications and half of Tandem's new customers were obtained because of specific applications software, many of which were supplied by third-party software houses.

To get a better reading of the future impact on Tandem, we conducted a survey of its third-party software houses. The survey results were generally positive, but it will take time for the positive steps Tandem has taken to influence fundamentals.

While we would like to be more positive on the stock, we are maintaining our 3-3 rating. As our survey results indicate, there is still execution risk in Tandem's strategy. If Tandem can implement its plans successfully, it should mean sustainable and profitable growth, but 12 months away. In the meantime, Tandem stock has a ceiling in the low 20s.

SURVEY SUMMARY

We surveyed software houses participating in the company's Alliance program for cooperative marketing during the first quarter of 1985. The results were generally positive:

Opinion Legend: N = Up to 6 Months, L = 6 to 18 Months
1= Aggressive Purchase, 2 = Accumulate, 3 = Average Performer
4 = Swap, 5 = Sell

- Tandem received extraordinarily high marks for its products.
- Ninety-three percent of respondents stated they were not planning to change vendors.
- Most respondents described their potential markets as big and largely untapped.
- Almost all respondents believed the slower revenue growth Tandem has been experiencing is due to management actions. The consensus that a slowing growth rate is not due to any limitations dictated by market potential is encouraging.

On the negative side:

- 50% of respondents believed that Tandem was not committed to third-party software houses.
- Many complained about a lack of guidance from Tandem regarding product direction.
- Few of the software houses participating in our survey have large marketing staffs or nationwide coverage.

MANAGEMENT'S RESPONSES TO OUR SURVEY

Management stated in response to our survey results:

- The Alliance program, initiated about one year ago, is still experiencing growing pains. The commitment at headquarters has not been transmitted to the field in a consistent manner. Management stated it has addressed these issues and perceptions should be improving.
- Product direction has not been clearly articulated because the company has not had its product priorities in focus. The company is currently in the process of explaining its plans to its field organization and customers.
- Management stated that all products and features described by our survey respondents as desirable future products would become Tandem products during the next 24 months.
- Tandem's management agreed that its slower than expected revenue growth is of its own doing and believes that applications software for its targeted market segments--Manufacturing, Banking, Telecommunications, Point-of-sale, Airlines and Federal Government--will be key to generating higher revenue growth.

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RESPONDENTS PROFILE

Fifty-three percent of the 47 software houses listed in Tandem's Alliance Directory (October 1984) responded to our survey. Five of the respondents were not actively marketing software for Tandem. Our responses are tallied from the 20 software houses (43% of total) that completed our written questionnaire. In most cases, we followed-up with in-depth telephone interviews.

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TANDEM ALLIANCE PROGRAM
SURVEY OF PARTICIPANTS

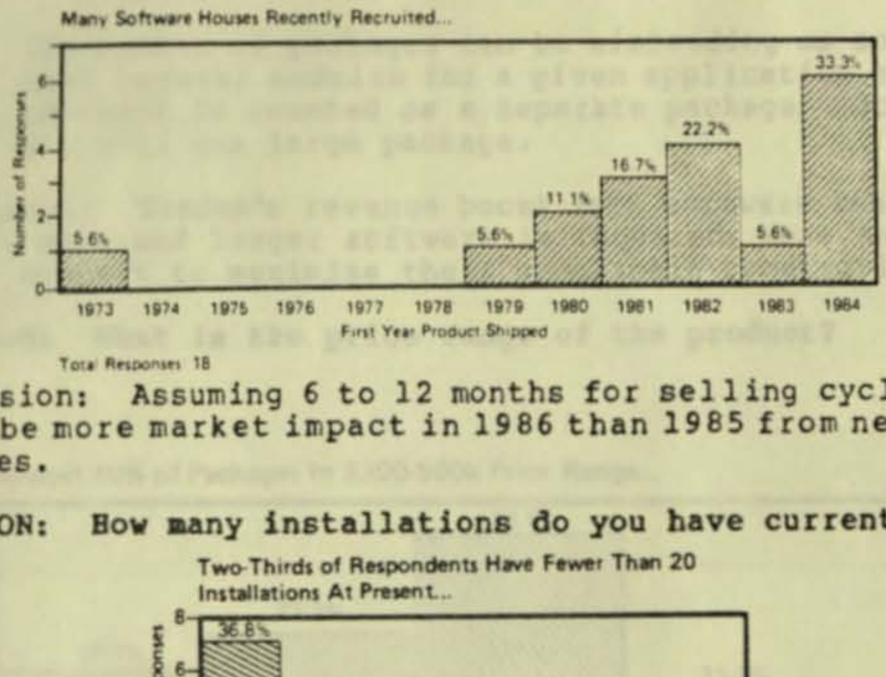
PRODUCT DESCRIPTION

Responding software vendors by industry:

	Number of Vendors
Banking/Finance	8
Manufacturing	5
Non-Financial Service	1
Communications	1
Cross Industry, General and Miscellaneous	5
Total	20

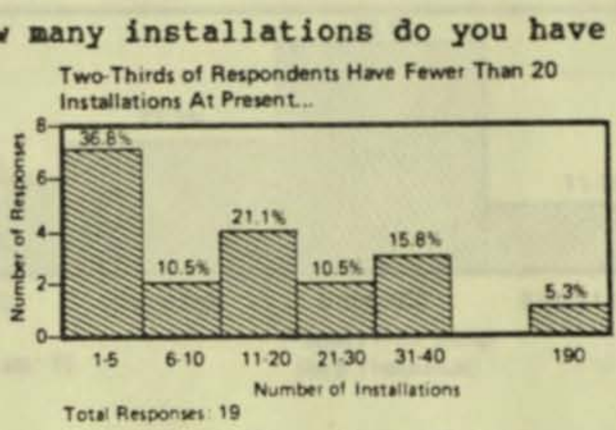
NOTE: All but one of five vendors in Manufacturing has packages installable at customer sites now.

QUESTION: How long have you been shipping your product?



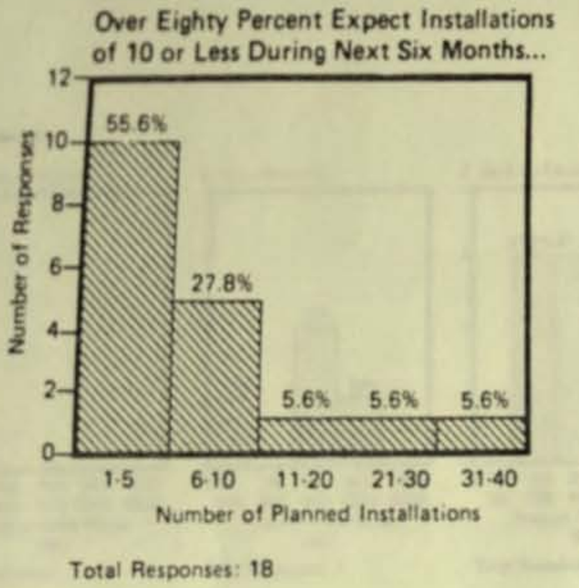
Conclusion: Assuming 6 to 12 months for selling cycle, there could be more market impact in 1986 than 1985 from newer packages.

QUESTION: How many installations do you have currently?



Conclusion: This is an indication of the newness of some software recruits as well as their limited marketing resources. Tandem will need to increase the number of software houses and help existing ones broaden their markets.

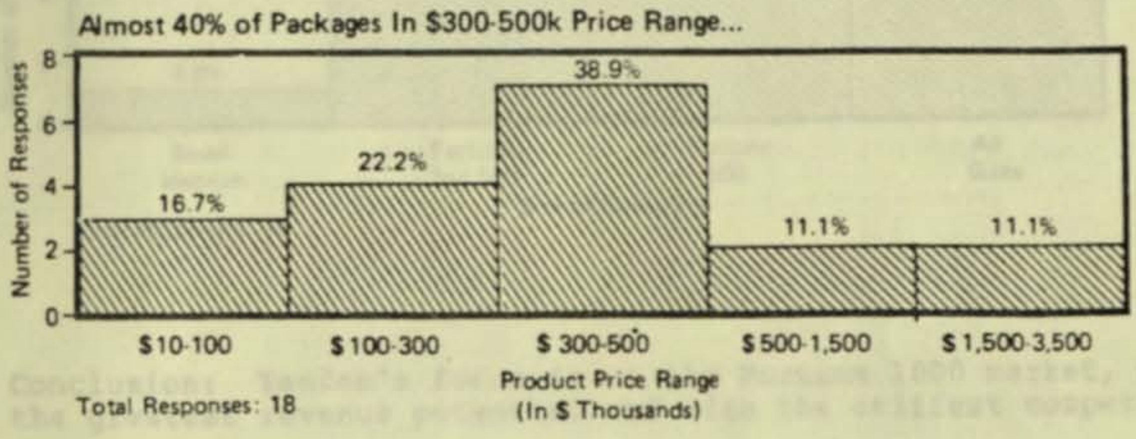
QUESTION: **How many installations are planned for the next six months?**



Note: The number of packages can be misleading as some vendors have several modules for a given application environment and each is counted as a separate package. Other vendors may sell one large package.

Conclusion: Tandem's revenue boost from software houses still modest; more and larger software is required; more and better Tandem support to maximize their geographic penetration.

QUESTION: **What is the price range of the product?**



Conclusion: Expensive packages, concentrated in Banking/Finance and Manufacturing, are important strategic sales for Tandem; the applications are critical to the end users.

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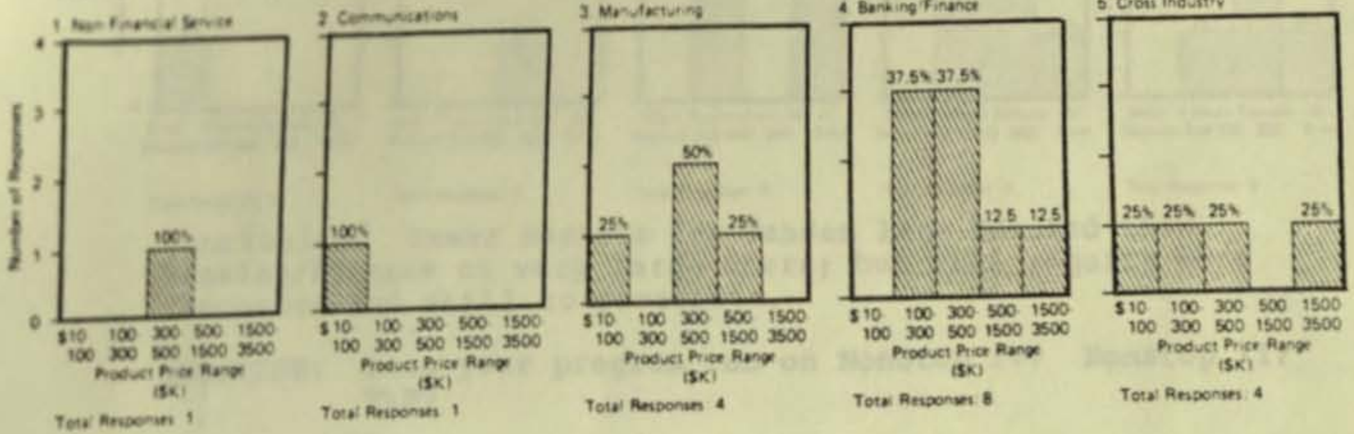
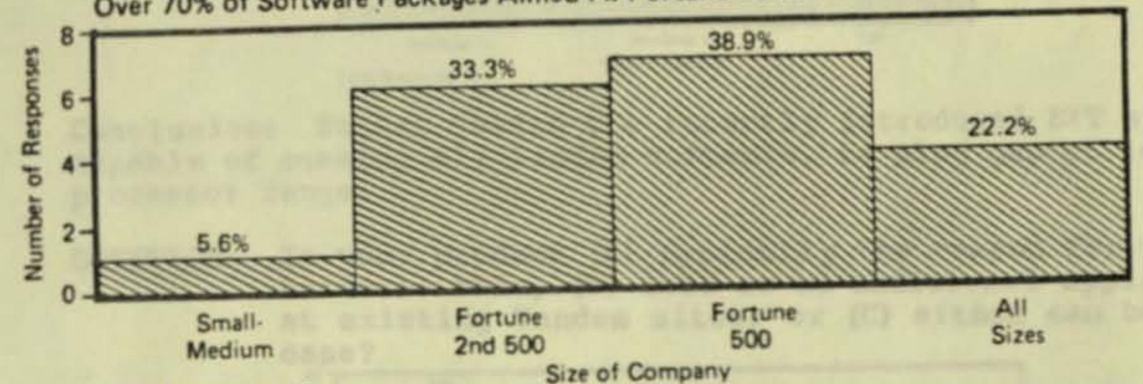
RESPONSES BY INDUSTRY:

Banking/Finance Packages Most Expensive ...



QUESTION: What size company or organization would use your software?

Over 70% of Software Packages Aimed At Fortune 1000 Market...

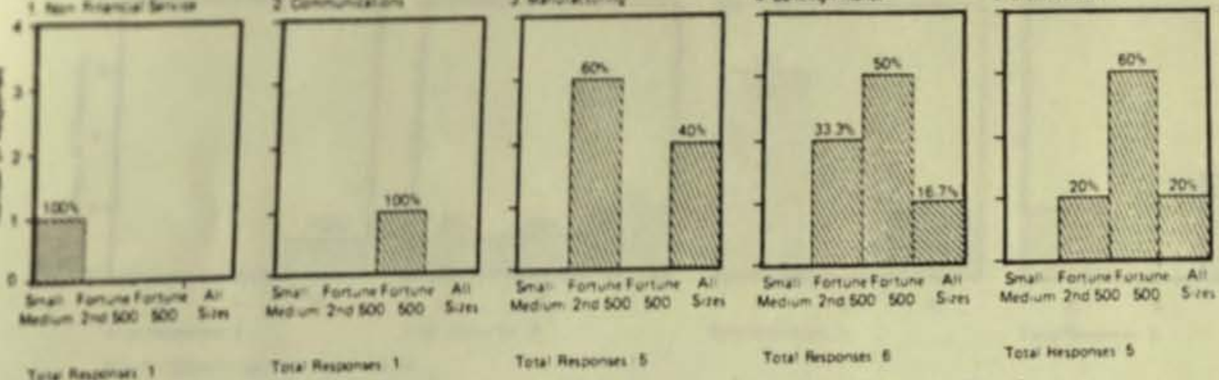


Total Responses: 18

Conclusion: Tandem's focus is on the Fortune 1000 market, with the greatest revenue potential and also the stiffest competition.

RESPONSES BY INDUSTRY:

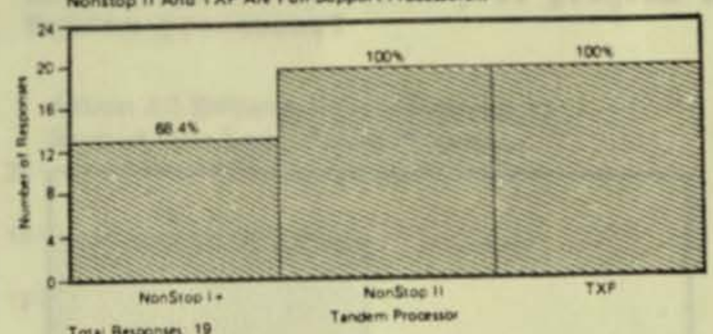
Banking/Finance Package Aimed At Largest Customers; Manufacturing At Second Fortune 500...



Conclusion: Newer markets for Tandem less focused than Banking/Finance on very large users; but will require more resources and skill to penetrate.

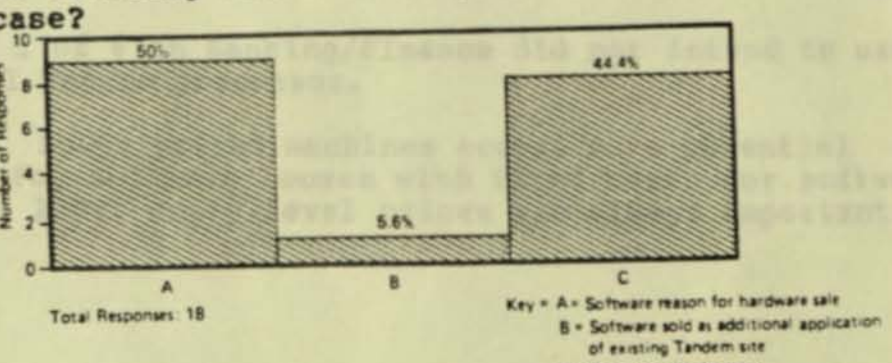
QUESTION: Does your program run on NonStop I+? NonStop II? TXP?

Nonstop II And TXP Are Full Support Processors...



Conclusion: Tandem needed the recently introduced EXT system, capable of running all Tandem software, to plug gap at low-end of processor range.

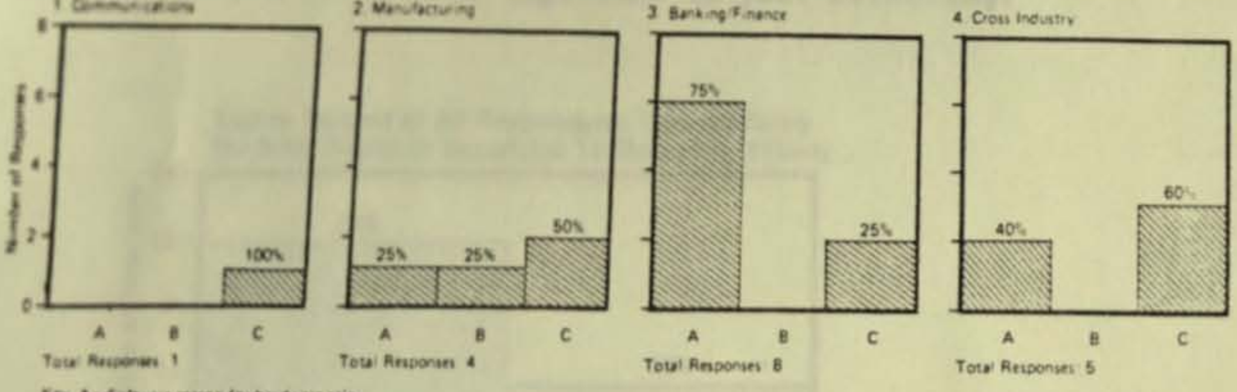
QUESTION: Is your product (A) typically the reason for the hardware sale, (B) sold as an additional application at existing Tandem sites, or (C) either can be the case?



Conclusion: Tandem sales support is critical to sales.

RESPONSES BY INDUSTRY:

Banking/Finance Software Is The Reason For Tandem Sales; Other Areas Are More Joint Sales

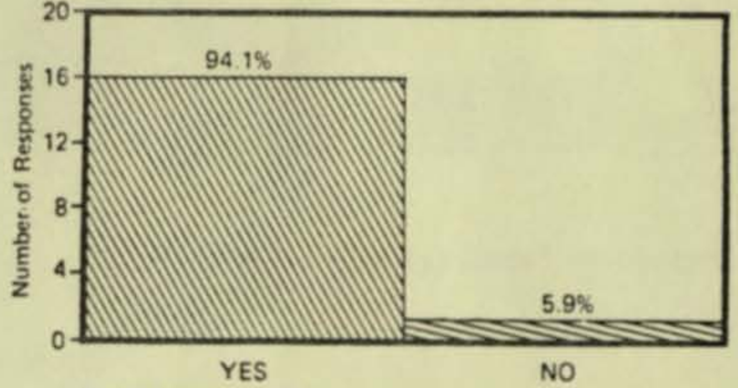


Key: A = Software reason for hardware sale
B = Software sold as additional application of existing Tandem site
C = Either can be the case

Conclusion: More selling of Tandem systems required outside of Banking/Finance, where there is an obvious fit. This underscores need for more effective sales and marketing.

QUESTION: Do you intend to offer your program on an entry level Tandem processor?

Almost All Software Houses Planning to Support New Lower Priced Processor...



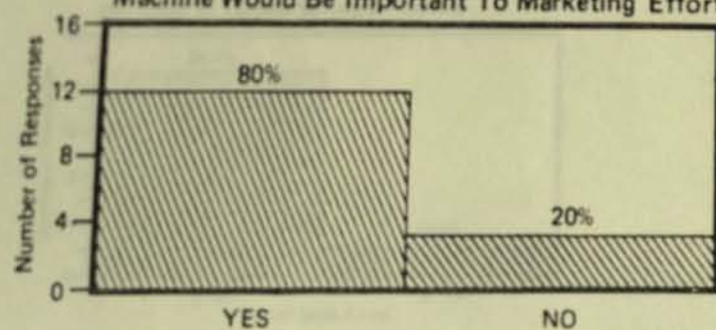
Total Responses: 17

NOTE: Only 1 of 6 in Banking/Finance did not intend to use entry level Tandem processor.

Conclusion: Lower priced machines access more potential customers. For software houses with fixed costs for software development, lower entry level prices are always important.

QUESTION: If yes, will this be important to your marketing?

Eighty Percent of All Respondents Believed Entry Machine Would Be Important To Marketing Efforts...



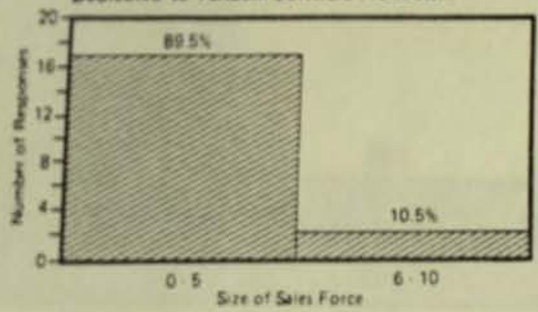
Total Responses: 15

NOTE: 1 of 4 Cross Industry and 1 of 1 Communications companies responded negatively.

SOFTWARE HOUSE PROFILE

QUESTION: What is the size of the salesforce for the product mentioned?

90% of Respondents Have 5 or Less Sales People Dedicated to Tandem Software Products...

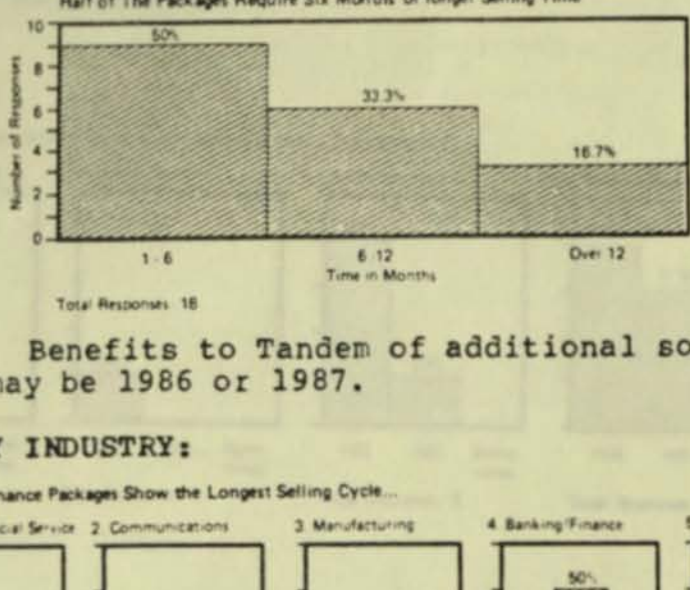


Total Responses: 19

Conclusion: Tandem needs more and bigger software houses to leverage applications. It also must devise ways to help the smaller software houses reach the entire installed base.

QUESTION: What is the average amount of time required to sell your product?

Half of The Packages Require Six Months or longer Selling Time

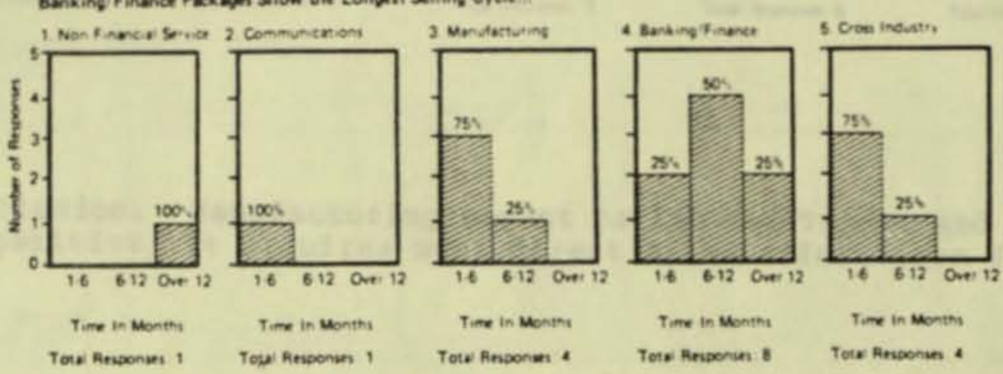


Total Responses: 18

Conclusion: Benefits to Tandem of additional software houses not immediate; may be 1986 or 1987.

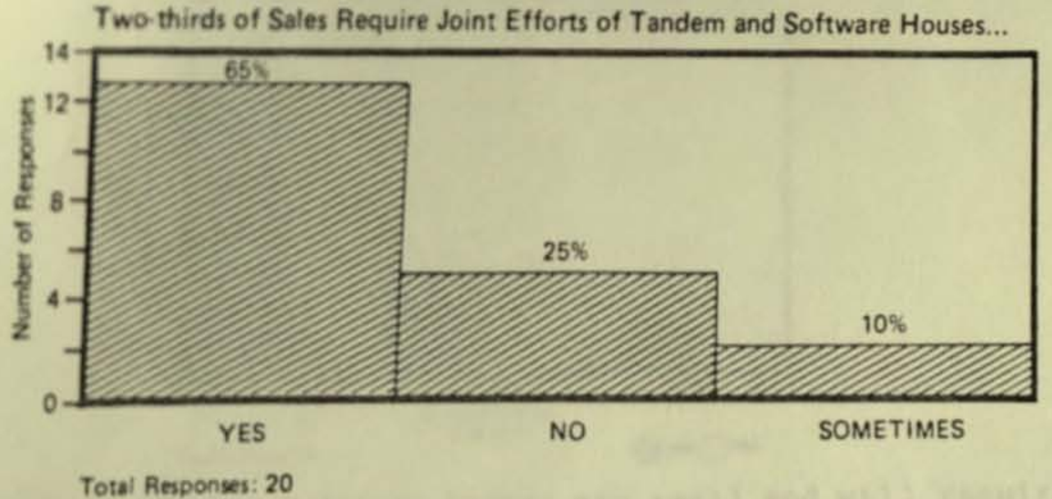
RESPONSES BY INDUSTRY:

Banking/Finance Packages Show the Longest Selling Cycle...



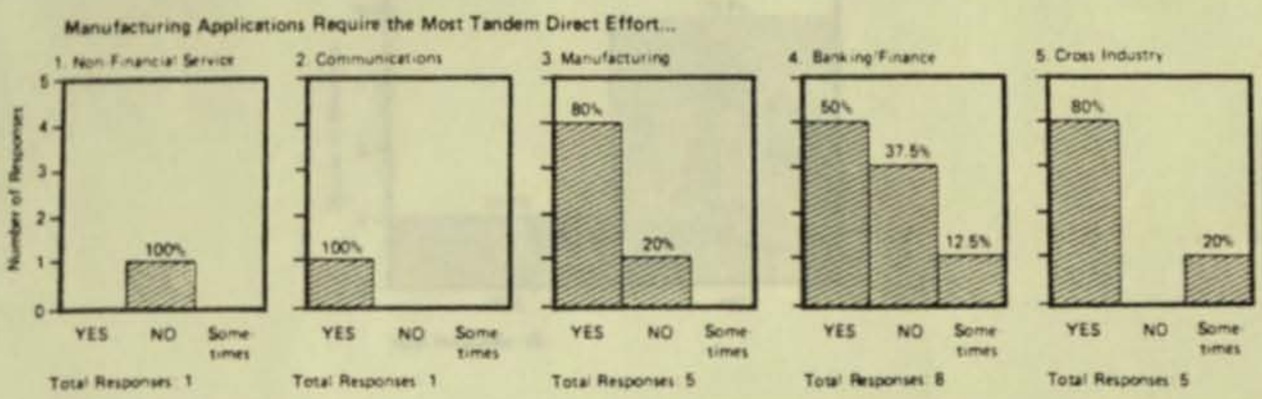
Conclusion: Selling cycle longest in Banking/Finance; Tandem's diversification efforts into Manufacturing and other areas may shorten selling cycle.

QUESTION: **Does a sale require cooperative customer sales efforts with Tandem?**



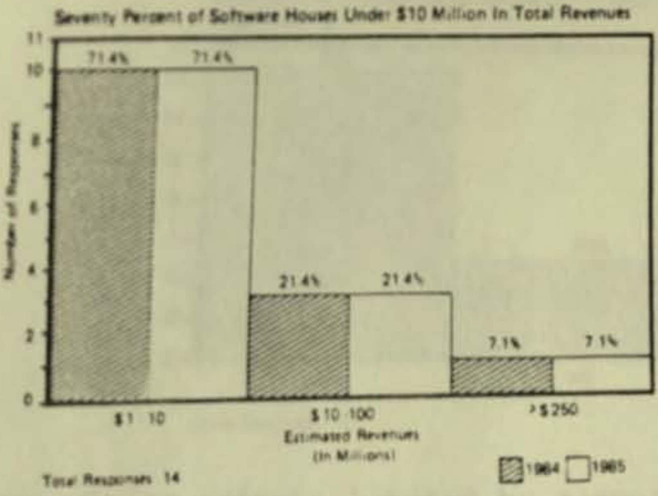
Conclusion: Tandem must have an effective sales and marketing program for third-party software to be successful.

RESPONSES BY INDUSTRY:



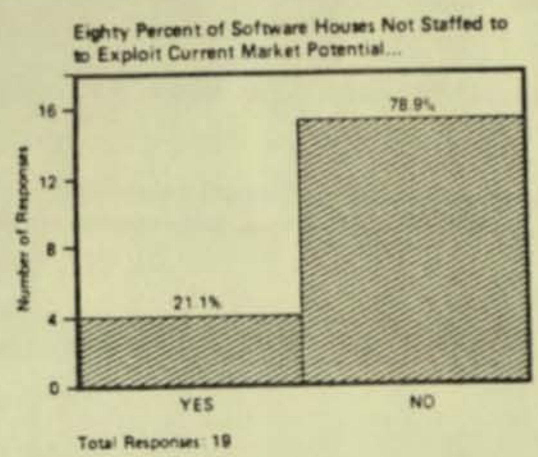
Conclusion: Manufacturing newest market for Tandem and most competitive; it requires most direct sales effort from Tandem.

QUESTION: **What are your estimated total revenues for 1984 and projected revenues for 1985?**

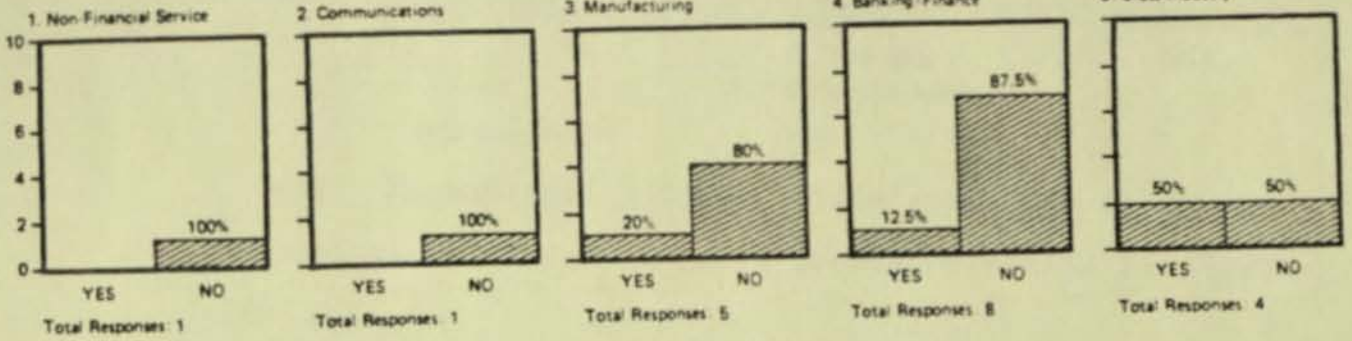


Conclusion: Tandem software houses are small and will require Tandem support to leverage their applications to a broad base of customers.

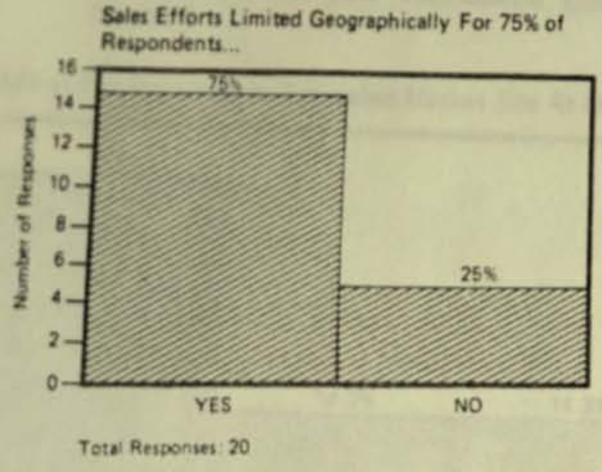
QUESTION: **Are you staffed to exploit your total market domestically and internationally?**



RESPONSES BY INDUSTRY:



QUESTION: **Are your sales and sales efforts focused in certain geographic areas?**

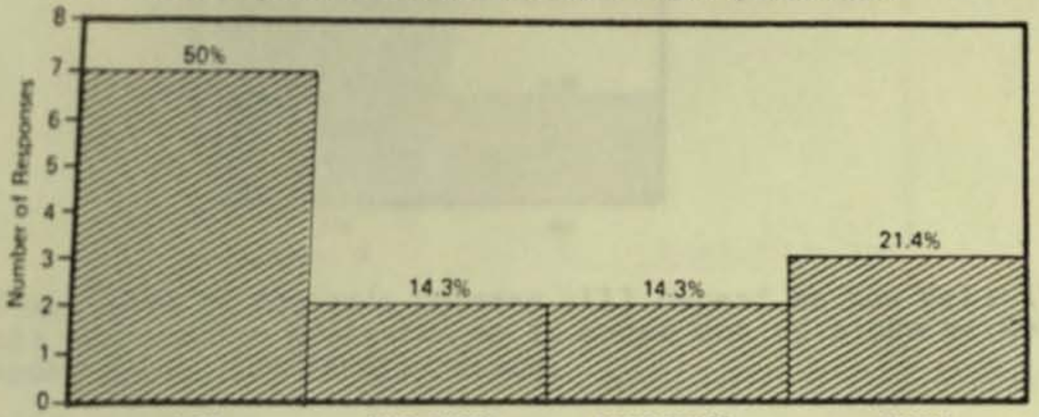


Conclusion: Sales efforts limited by resources of small software houses and often focused on Tandem's installed base, which are potentially easier sales, rather than on new customers. Good management of marketing effort needed by Tandem to gain maximum advantage from applications availability.

MARKET INFORMATION

QUESTION: How large do you estimate the market for your product to be?

Half of The Respondents Estimated Market Size At Over $100 Million...

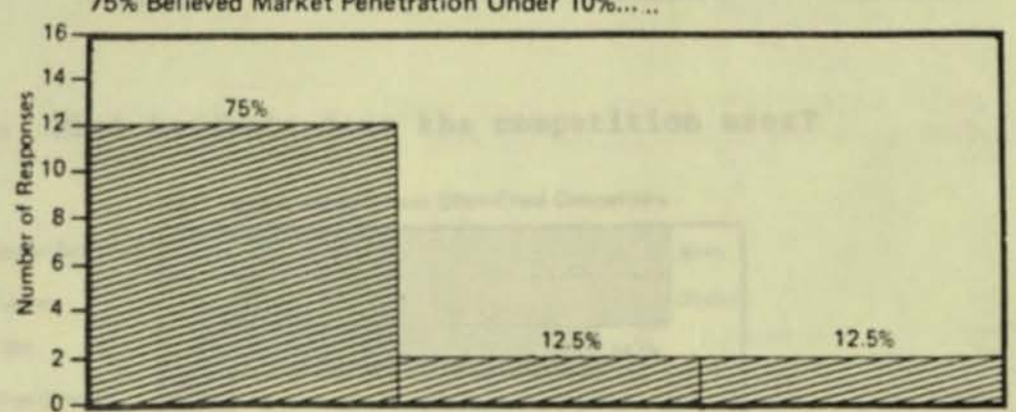


Total Responses: 14

Conclusion: Market size not a constraining factor in any of Tandem's markets. Critical path is Tandem's learning how to exploit markets most effectively.

QUESTION: How much of this estimated market has been penetrated?

75% Believed Market Penetration Under 10%.....

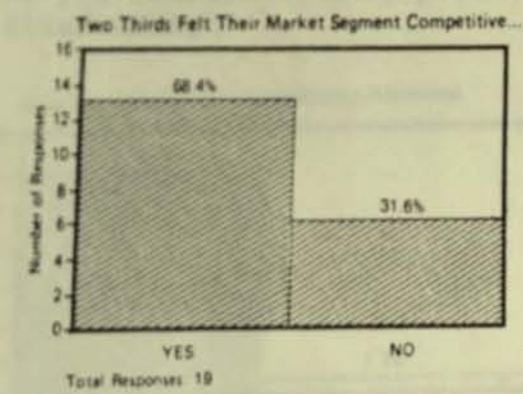


Total Responses: 16

NOTE: No material industry differentiation in responses.

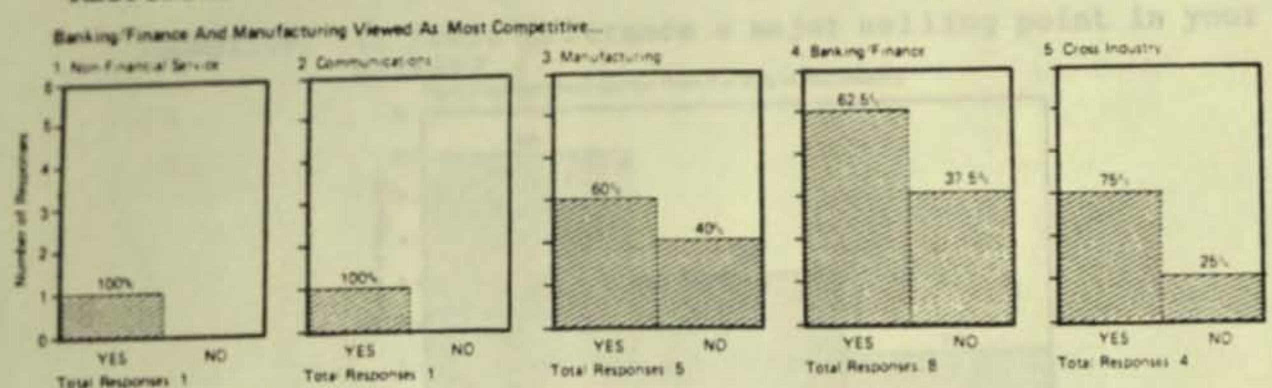
Conclusion: There is large growth potential for Tandem.

QUESTION: **Is there much competition?**

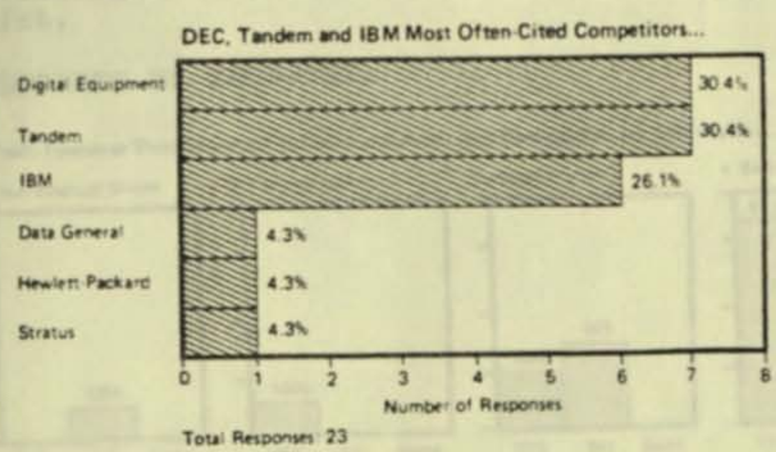


Conclusion: Much of Tandem's success will depend on how well it deals with competitive pressures as it moves out of niche markets into broader areas like manufacturing.

RESPONSES BY INDUSTRY:

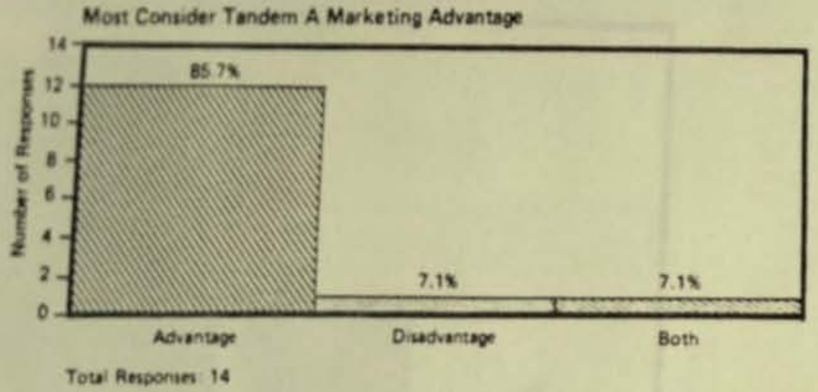


QUESTION: **What hardware does the competition uses?**



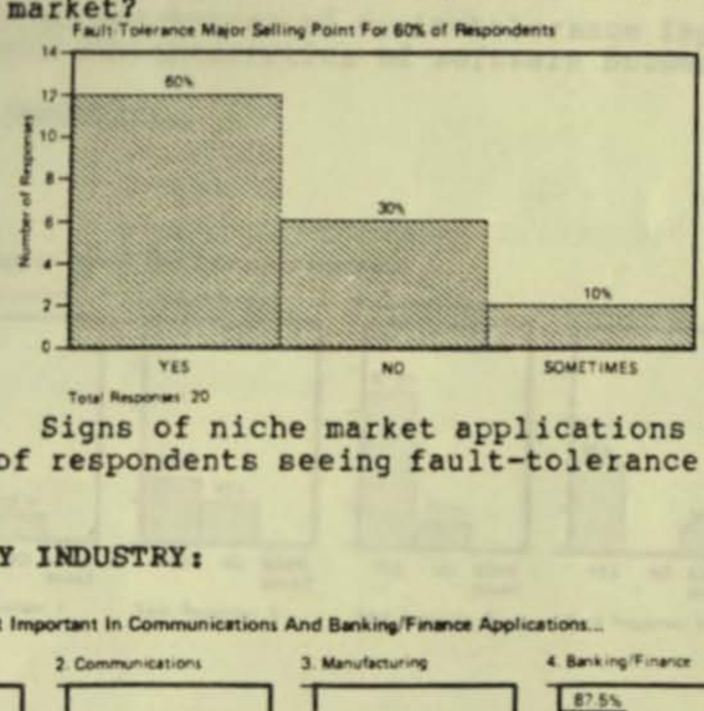
Conclusion: In many areas, Tandem software houses compete with one another. Otherwise, Tandem must compete with marketshare leaders IBM and DEC.

QUESTION: Do you consider Tandem processors an advantage or disadvantage?



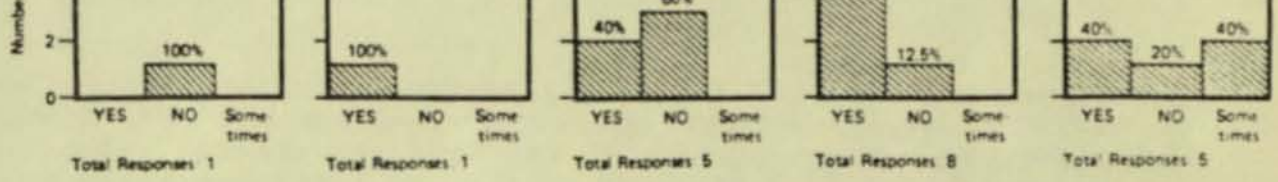
Conclusion: Software houses have chosen Tandem as a superior technical solution for their specific applications.

QUESTION: Is fault-tolerance a major selling point in your market?



Conclusion: Signs of niche market applications in high percentage of respondents seeing fault-tolerance as major selling point.

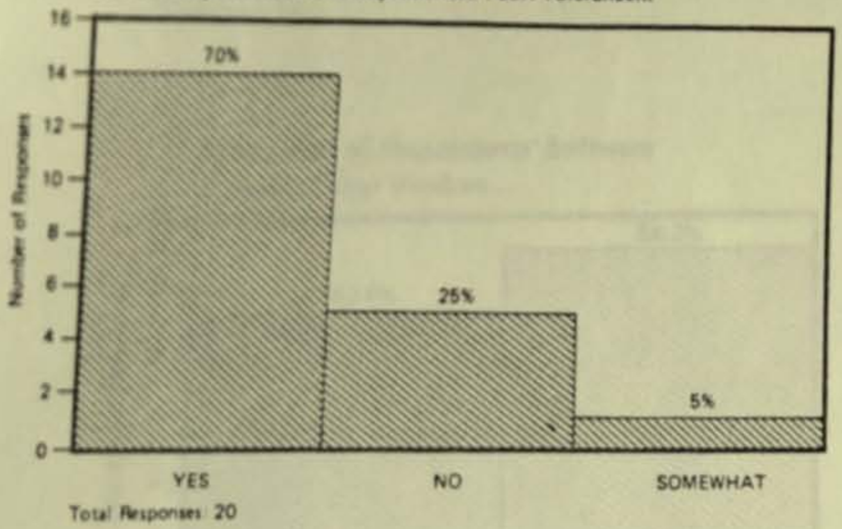
RESPONSES BY INDUSTRY:



Conclusion: Tandem needs to compete on other system attributes beside fault-tolerance outside of Banking/Finance.

QUESTION: **Have you implemented fault-tolerance in your application?**

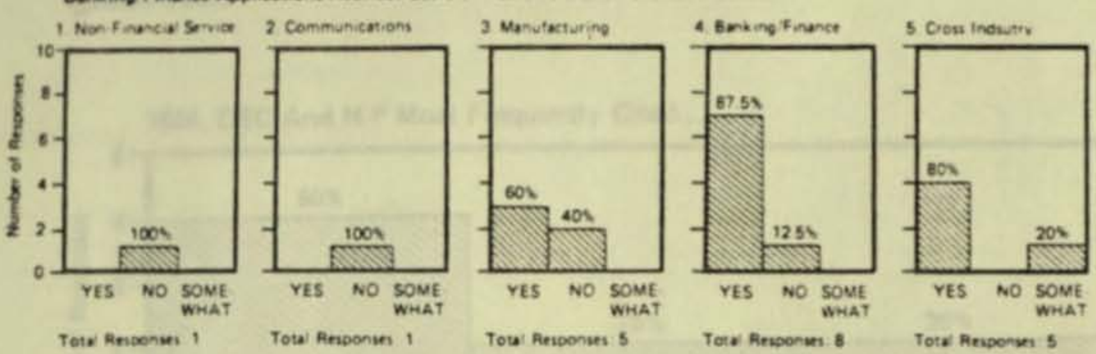
70% of Respondents Have Implemented Fault-Tolerance...



Conclusion: High percentage of fault-tolerance implementation reinforces niche characteristics of software houses.

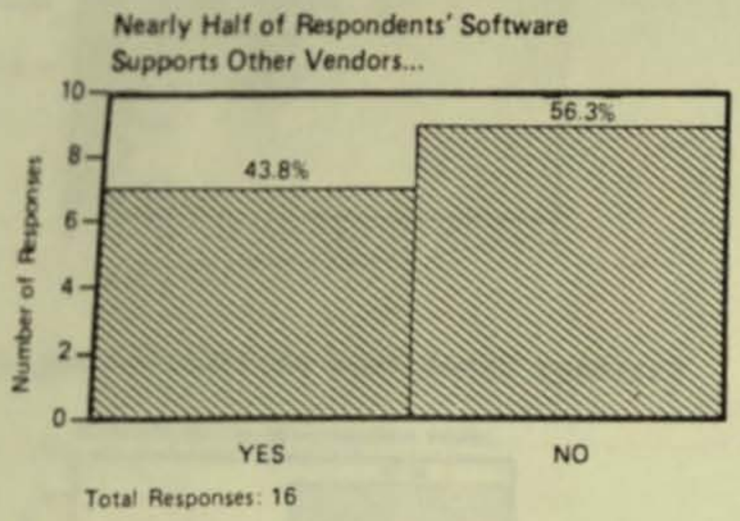
RESPONSES BY INDUSTRY:

Banking/Finance Applications Heaviest Users of Fault-Tolerance Characteristics...

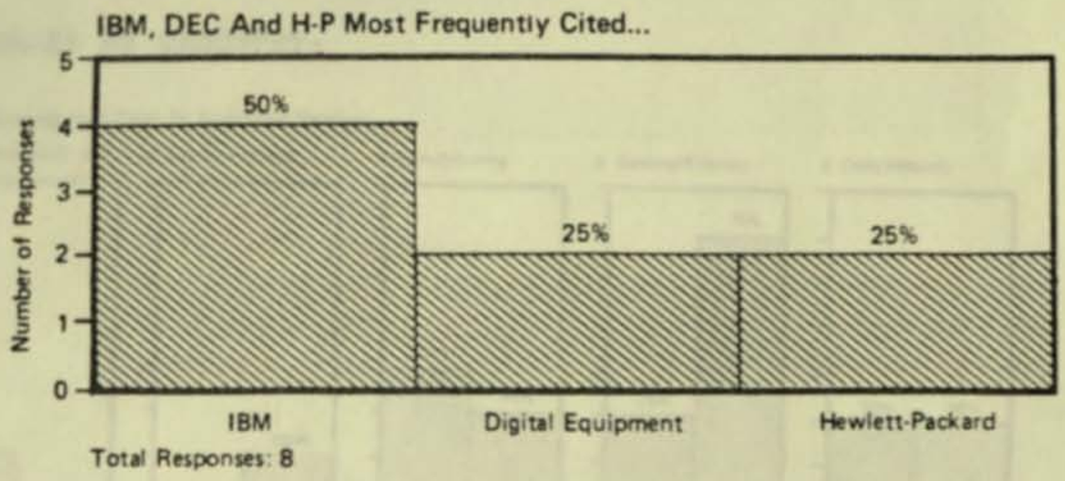


OTHER HARDWARE PLATFORM INFORMATION

QUESTION: Does your program run on equipment other than Tandem's?

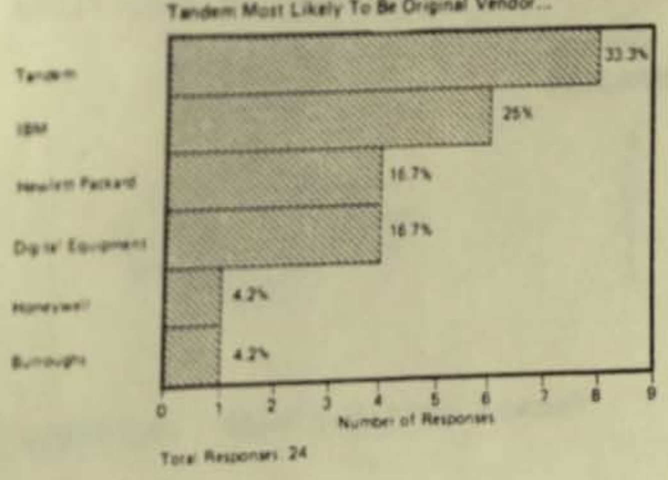


Equipment other than Tandem's mentioned in response to previous question:

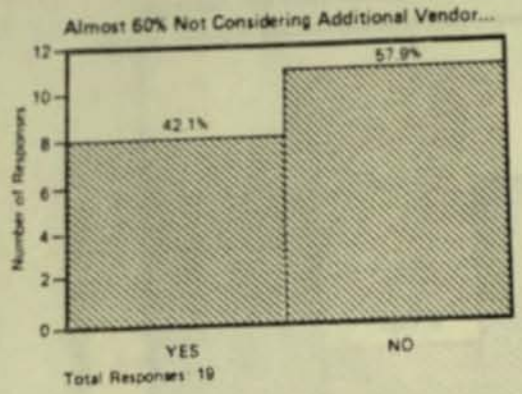


Conclusion: Tandem's competition is not Stratus, but marketshare leaders IBM, DEC and H-P. Although Tandem's system is better suited for certain applications it must be competitive with these broad-based suppliers to grow in the general transaction processing market.

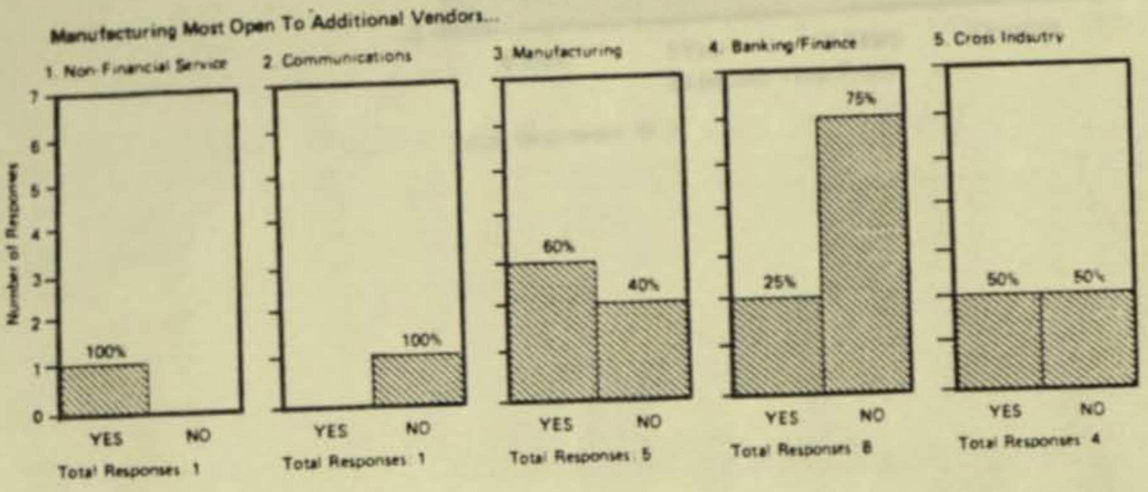
QUESTION: Which vendor was your original hardware platform?



QUESTION: Are you considering additional vendors?



RESPONSES BY INDUSTRY:

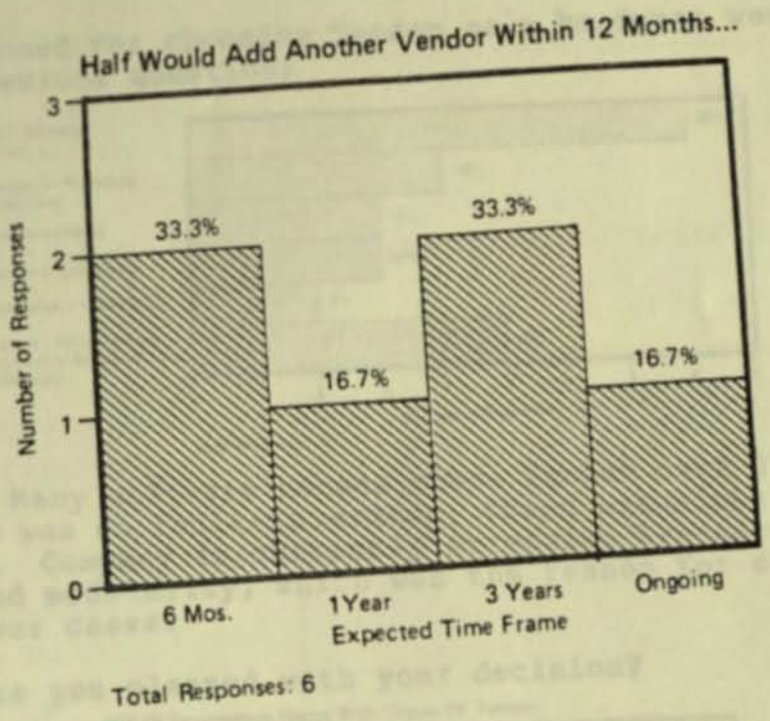


Conclusion: There is more competition in Tandem's newer targeted markets than in Banking/Finance.

Additional vendors mentioned in response to previous question:

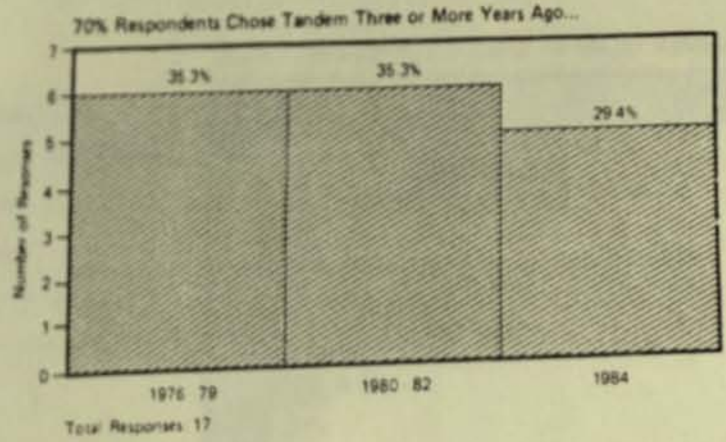
Mentioned Vendors	Number of Responses	Percent of Total
IBM	4	50.0%
Data General	1	12.5%
Digital Equipment	1	12.5%
Hewlett-Packard	1	12.5%
INTEL	1	12.5%

QUESTION: Expected time frame?

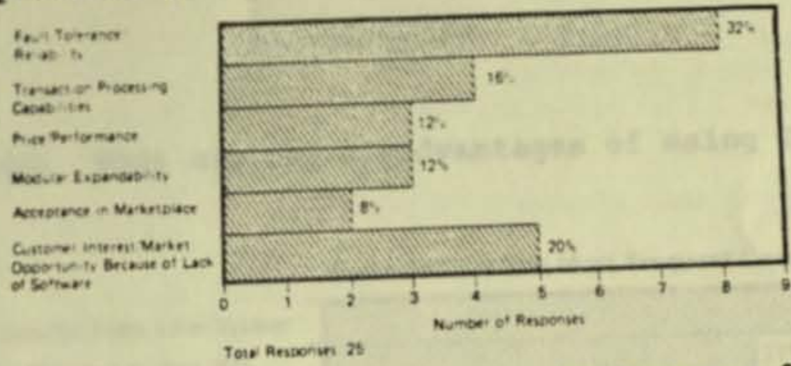


EXPERIENCE WITH TANDEM

QUESTION: When did you choose Tandem as a hardware vendor?

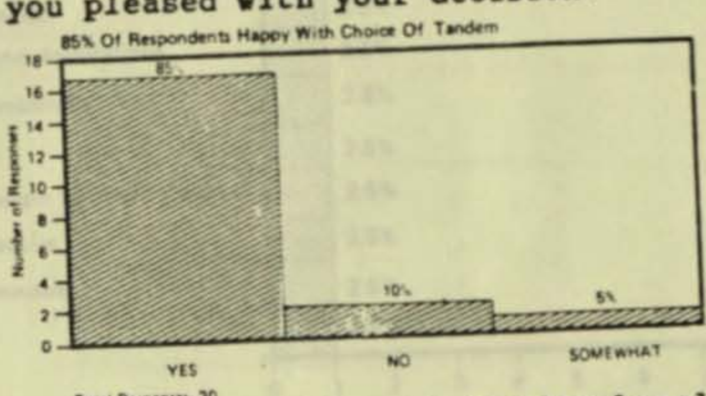


Reasons mentioned for choosing Tandem as a hardware vendor -- in reponse to previous question:



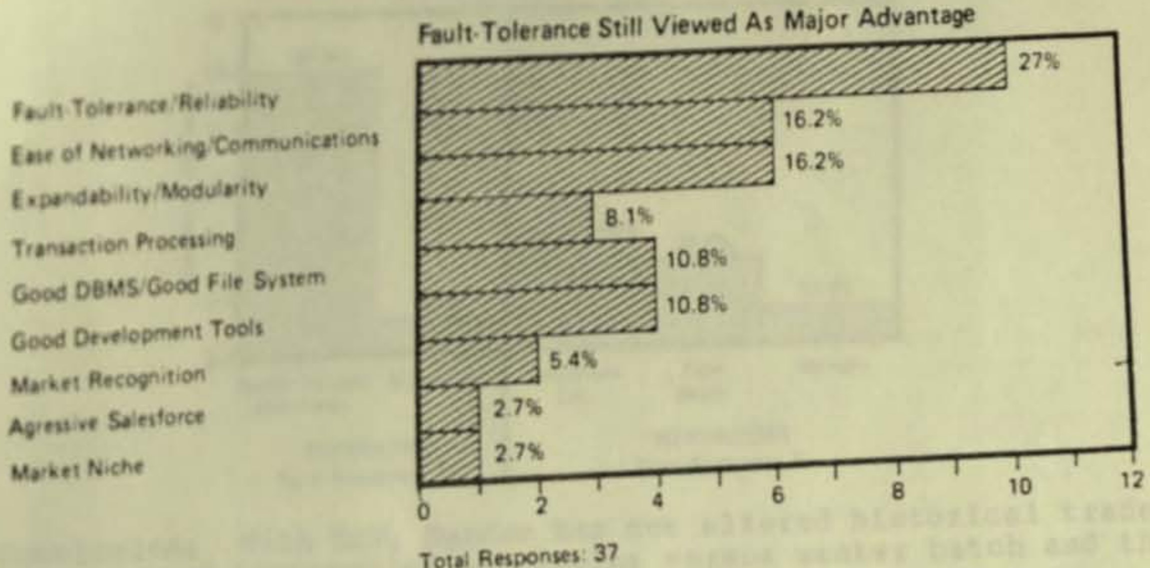
Conclusion: Many software houses chose Tandem over 3 years ago when emphasis was on fault-tolerance; these are niche market applications. Company is currently stressing transaction processing and modularity, which was the reason for choosing Tandem in fewer cases.

QUESTION: Are you pleased with your decision?

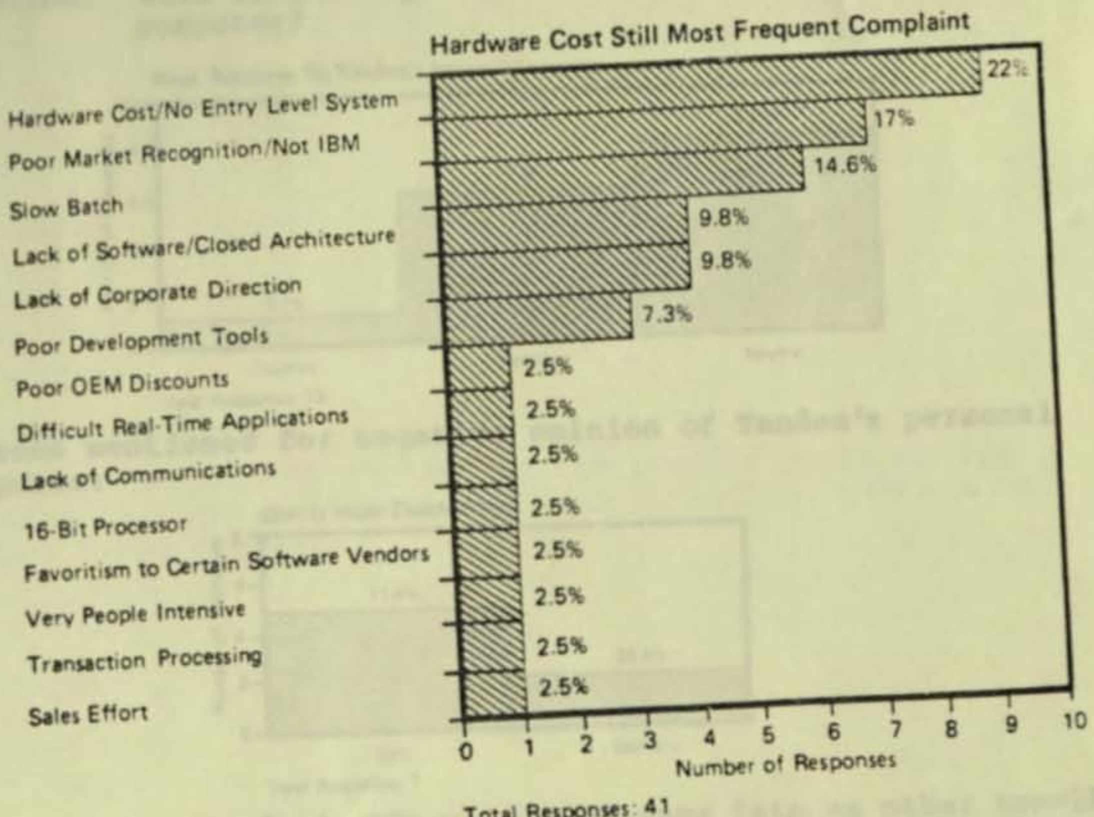


Conclusion: This is a very high satisfaction level. The complex tasks Tandem's software houses are trying to accomplish are well-suited to the capabilities of the Tandem products.

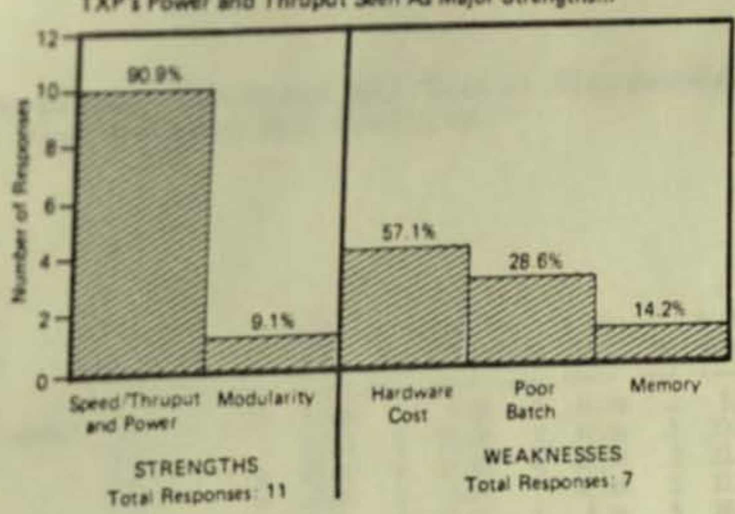
QUESTION: What are the major advantages of using Tandem?



QUESTION: What are the disadvantages of using Tandem?

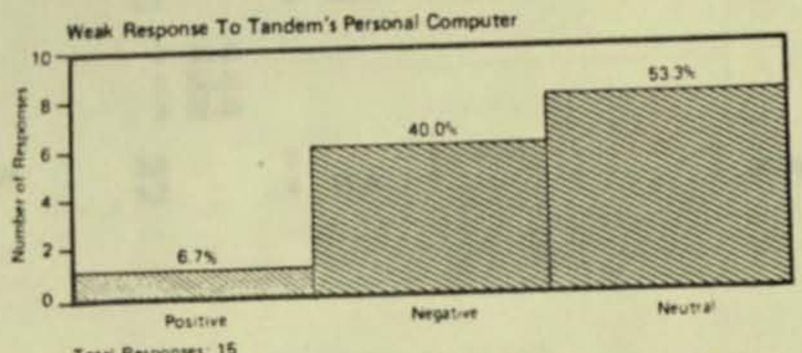


QUESTION: What is your opinion of Tandem's TXP processor?

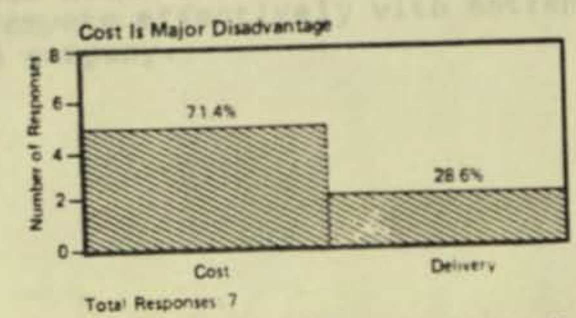


Conclusion: With TXP, Tandem has not altered historical trade-offs of good transaction processing versus weaker batch and the frequent complaint of higher cost. As Tandem pursues more mainstream and more competitive markets, it will need to improve on its weaknesses.

QUESTION: What is your opinion of Tandem's new personal computer?



Reasons mentioned for negative opinion of Tandem's personal computer:



Conclusion: Tandem's PCs will meet same fate as other non-IBM systems vendors. Beating IBM in a high-volume product like PC will not be possible.

QUESTION: What products are you most interested in seeing Tandem release? Scale of 1 - 5 (1 = high degree of interest, ... 5 = no interest).

A Low-priced Processor and Better Programming Aids Most Desired New Products

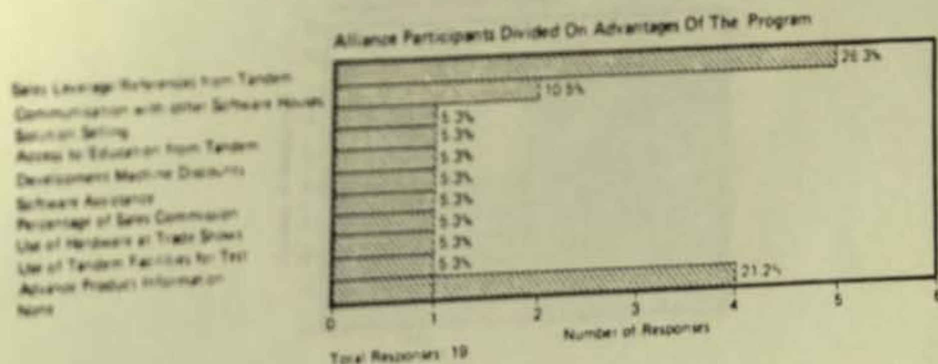
	Average	1's	% of Total	2's	% of Total	3's	% of Total	4's	% of Total	5's	% of Total	TOTAL
HARDWARE:												
low-priced, entry-level processors	1.6	13	72.2%	1	5.6%	2	11.1%	1	5.6%	1	5.6%	18
communications controllers	2.4	7	41.2%	2	11.8%	3	17.6%	3	17.6%	2	11.8%	17
disks	2.6	4	23.5%	4	23.5%	4	23.5%	2	11.8%	3	17.6%	17
high-end processors	2.8	4	23.5%	1	5.9%	7	41.2%	2	11.8%	3	17.6%	17
terminals	3.1	3	17.6%	3	17.6%	1	5.9%	5	29.4%	5	29.4%	17
SOFTWARE:												
batch processing capabilities	2.1	6	40.0%	3	20.0%	3	20.0%	2	13.3%	1	6.7%	15
programming aids	1.9	7	46.7%	4	26.7%	2	13.3%	1	6.7%	1	6.7%	15
more/better IBM compatibility	2.2	6	37.5%	5	31.3%	2	12.5%	0		3	18.8%	16
network management	2.3	6	37.5%	3	18.8%	4	25.0%	1	6.3%	2	12.5%	16
changes/enhancements to operating system	2.3	4	30.8%	3	23.1%	2	15.4%	3	23.1%	1	7.7%	13
changes to data base	2.5	3	21.4%	3	21.4%	5	35.7%	2	14.3%	1	7.1%	14
new languages	2.8	4	33.3%	2	16.7%	1	8.3%	3	25.0%	2	16.7%	12
C	4 44.4%											
ADA	2 22.2%											
BASIC	2 22.2%											
office automation software	3.5	0		4	30.8%	1		2		6	46.2%	13
UNIX	3.2	4	36.4%	0		0		4	36.4%	3	27.3%	11

Total Responses: 18

Conclusion: Tandem needs to beef up the mundane parts of its product line to compete effectively with entrenched vendors as more than a niche company.

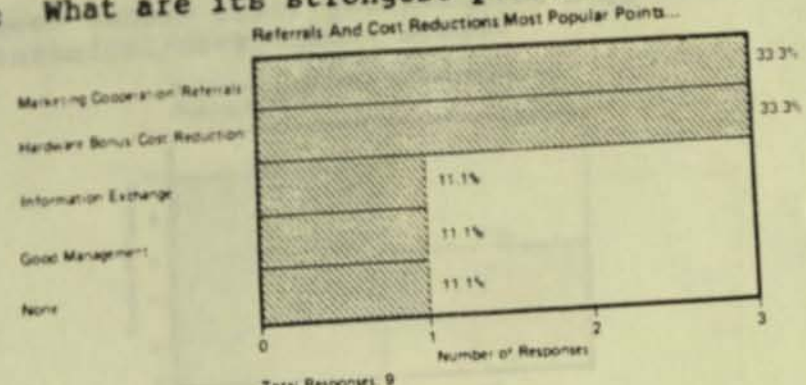
TANDEM ALLIANCE PROGRAM

QUESTION: What advantages does the Alliance program offer?



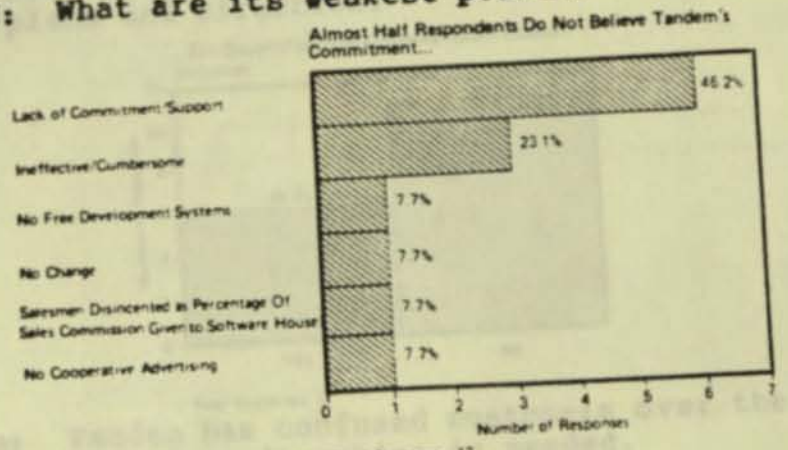
Conclusion: Tandem is in early stages of implementing an effective software house strategy. Much more support and consistency is needed.

QUESTION: What are its strongest points?

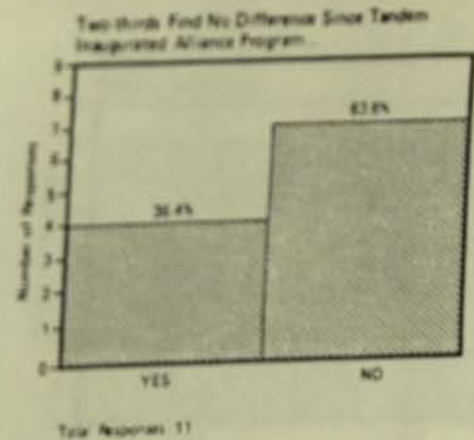


Conclusion: Tandem has made some progress by setting up mechanisms for referrals and hardware discounts. But follow through, measured by responses to the following two questions, not yet effective.

QUESTION: What are its weakest points?

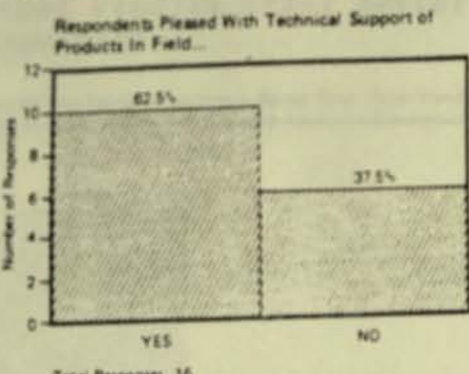


QUESTION: If you were a Tandem software house before the Alliance program, has Alliance changed things?



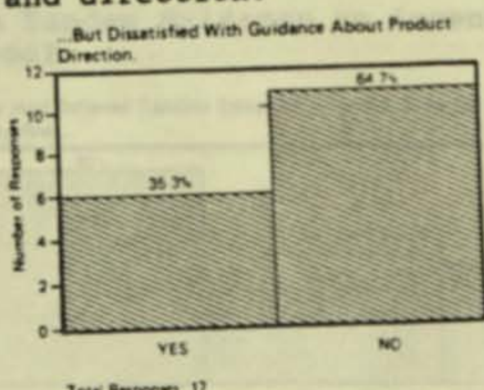
NOTE: Eleven of 15 respondents were Tandem software houses before Alliance program.

QUESTION: Does Tandem offer you adequate support in technical/development areas?



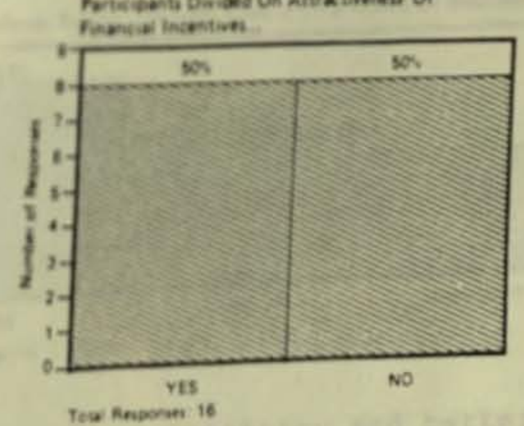
Conclusion: Tandem's strengths are its products; market and market planning are more of a challenge.

QUESTION: Does Tandem offer you adequate access to new product plans and direction?



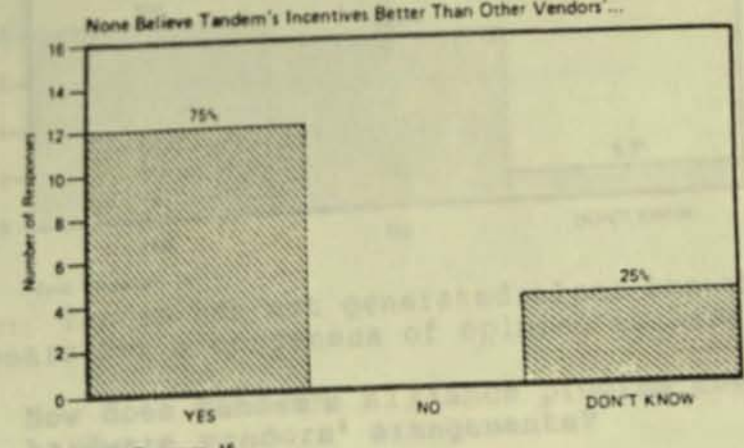
Conclusion: Tandem has confused customers over the last two years; clearer product direction is needed.

QUESTION: Does Tandem offer you adequate discounts and financial support/incentives?

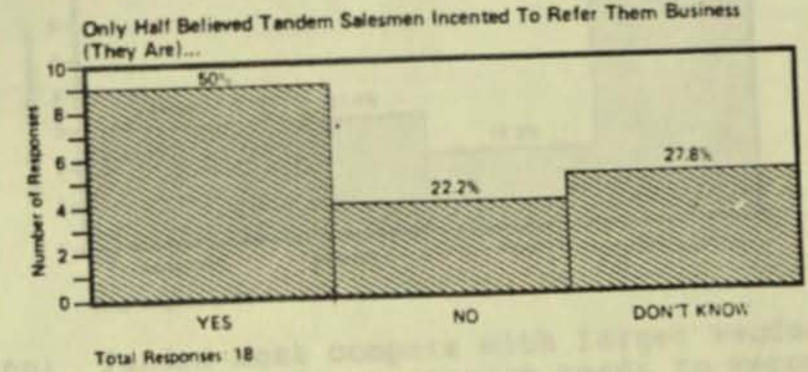


Conclusion: To attract software houses, Tandem will need to be competitive with IBM and DEC. The following response indicates that it is not there yet.

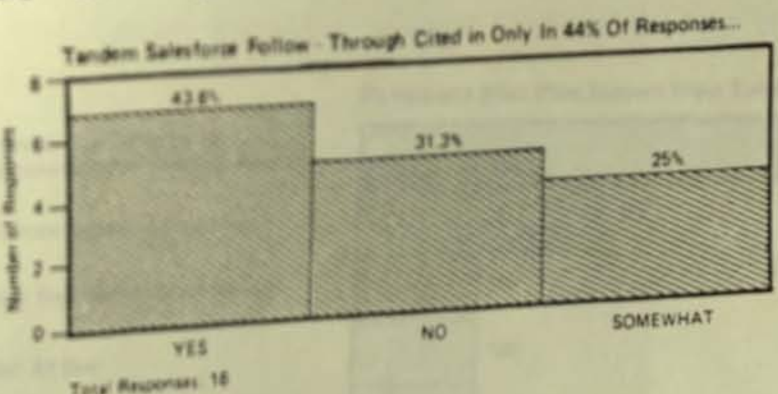
QUESTION: Do other vendors offer better discounts and/or commissions?



QUESTION: Have Tandem Salesmen an incentive to refer business to you?

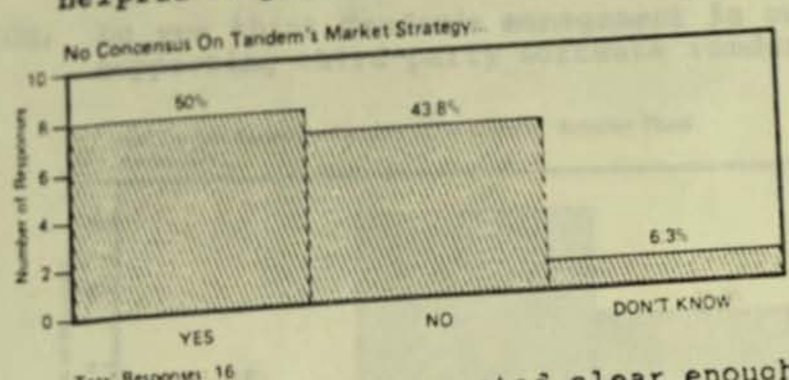


QUESTION: Do they do so?



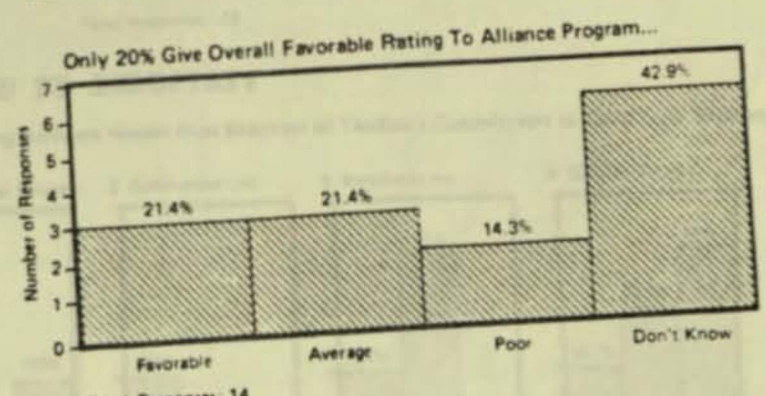
Conclusion: Geographic consistency and better management needed to exploit available software.

QUESTION: Is Tandem's current market organization and direction helpful to you?



Conclusion: Tandem has not generated clear enough signals over last two years for a concensus of opinion to have been reached.

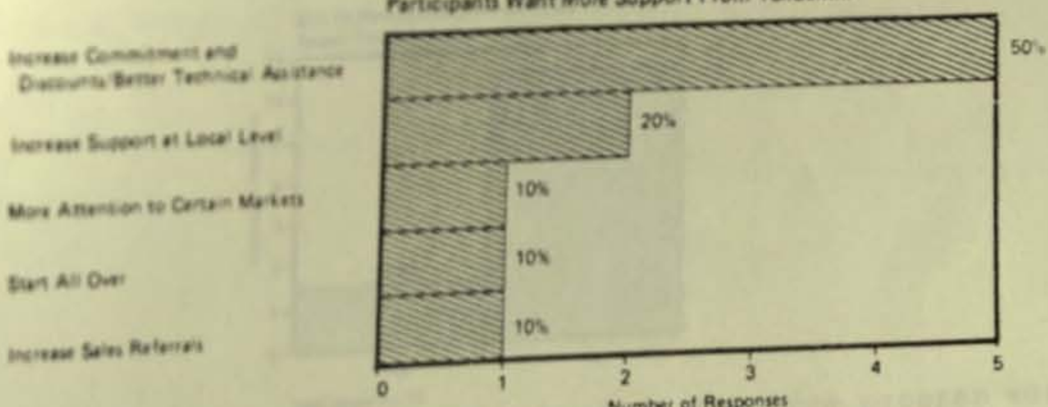
QUESTION: How does Tandem's Alliance program compare to other hardware vendors' arangements?



Conclusion: Tandem must compete with larger vendors for software houses efforts; the Alliance program needs to become more competitive in its incentive, support and execution.

QUESTION: Are there any aspects of Alliance you would like to see changed or improved?

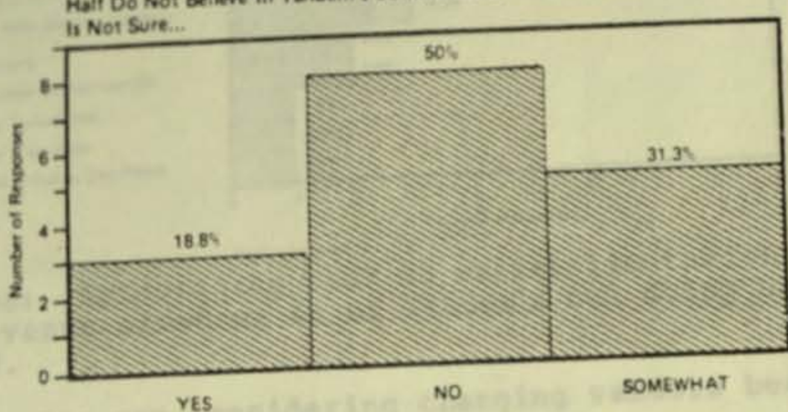
Participants Want More Support From Tandem...



Total Responses: 10

QUESTION: Do you think Tandem's management is committed to supporting third-party software vendors?

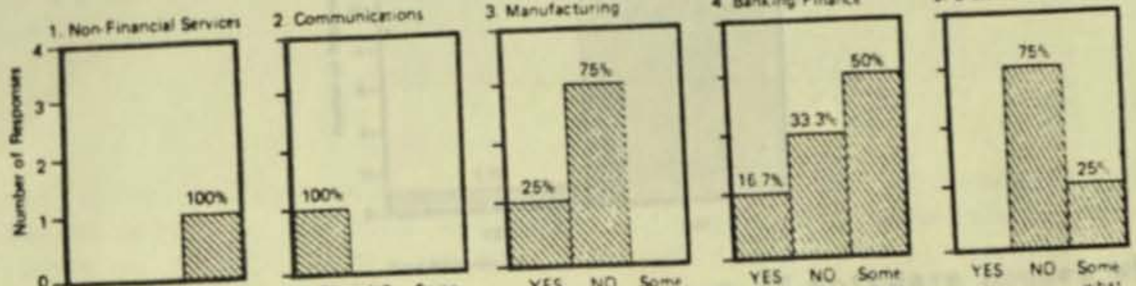
Half Do Not Believe In Tandem's Commitment; Another Third Is Not Sure...



Total Responses 16

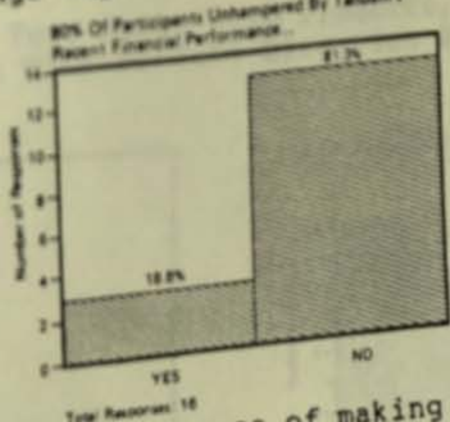
RESPONSES BY INDUSTRY:

Manufacturing Software Houses Most Skeptical of Tandem's Commitment to Third Party Vendors...



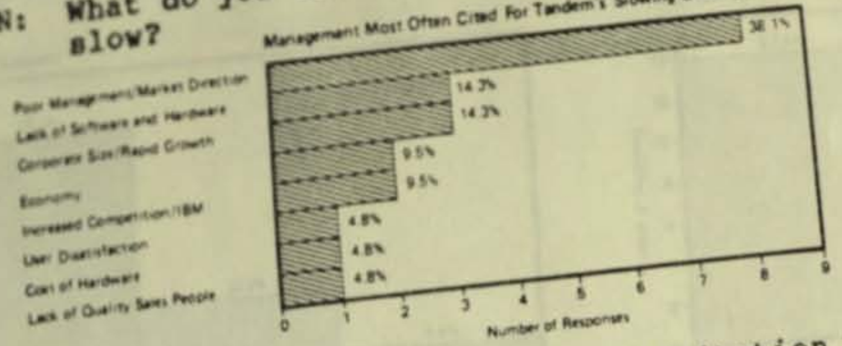
OBSERVATIONS ON TANDEM

QUESTION: Have Tandem's recent disappointing revenues and earnings impacted your sales?



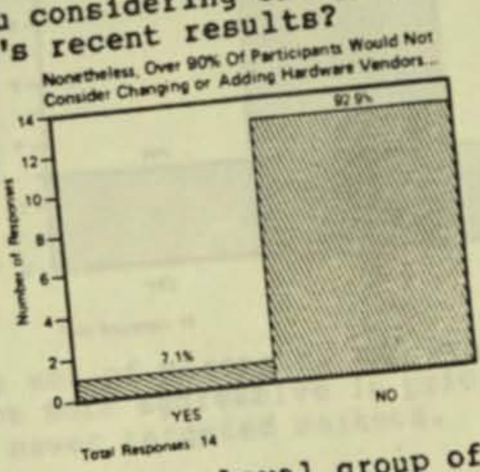
Conclusion: Real-world issues of making Alliance program work and new products most important to gaining new business.

QUESTION: What do you think caused Tandem's growth rate to slow?



Conclusion: Encouraging that no market limitation heading the list. Revenue slowdown is of Tandem's own doing and can be corrected.

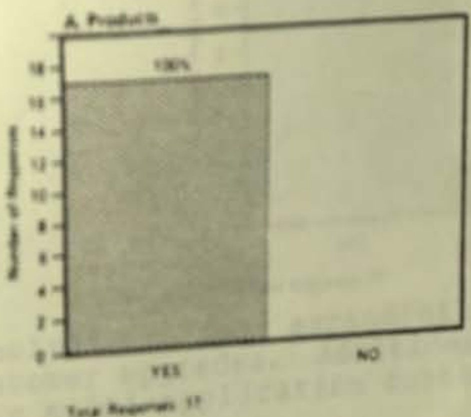
QUESTION: Are you considering changing vendors because of Tandem's recent results?

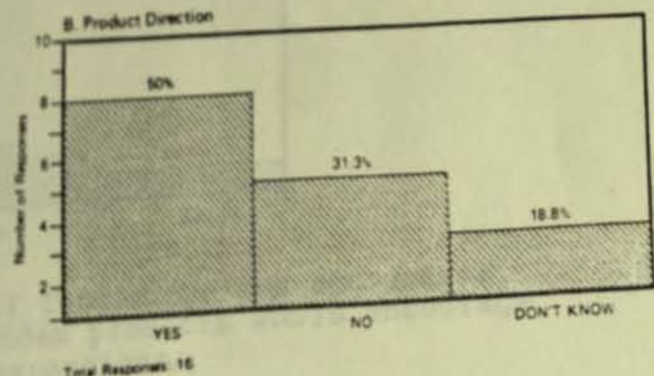


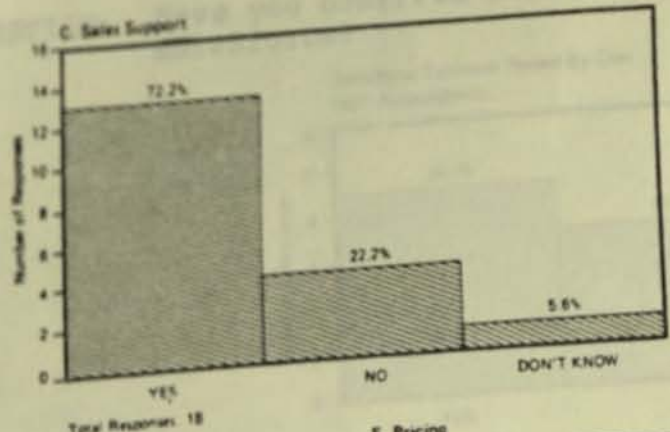
Conclusion: Tandem has a loyal group of software houses whose products it should exploit more aggressively.

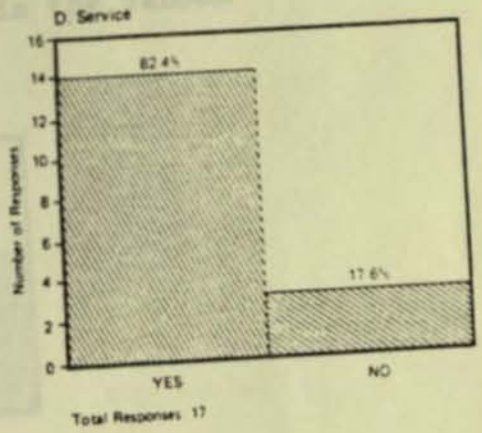
QUESTION: Are Tandem customers that you know happy with Tandem's A) Products, B) Product Direction, C) Sales Support, D) Service, E) Pricing?

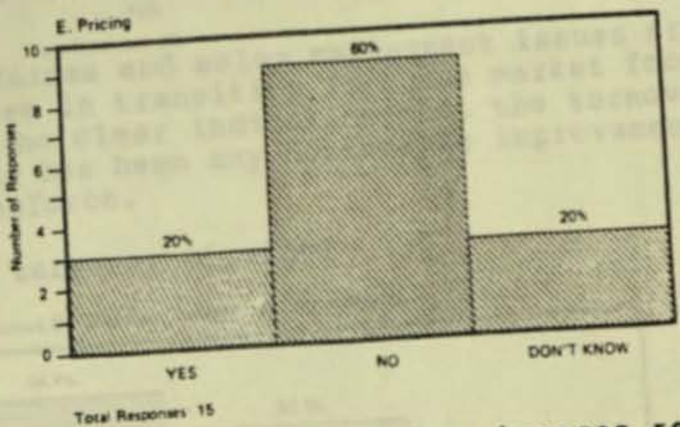
Customers Very, Very Happy With Products, Sales Support And Service, Less So With Product Direction And Pricing...





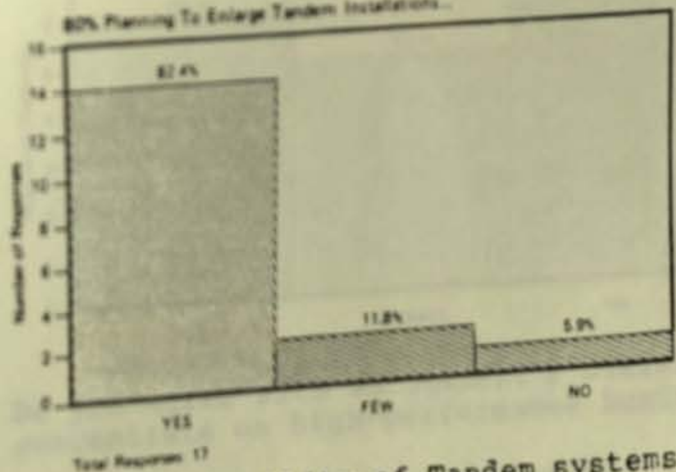






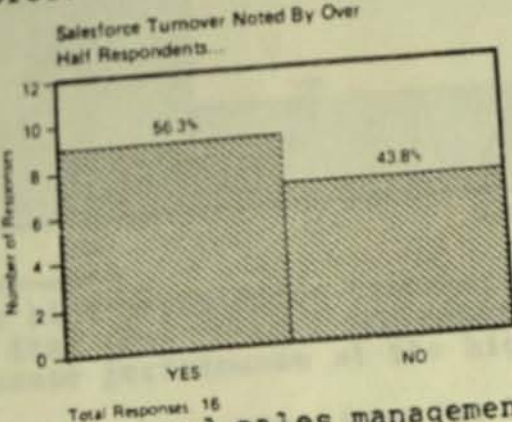
Conclusion: Same set of strengths and weaknesses reconfirmed. Tandem needs to be more aggressive in pricing especially when competing in its newer targeted markets.

QUESTION: Are these customers planning to enlarge their Tandem installations and/or add new applications?



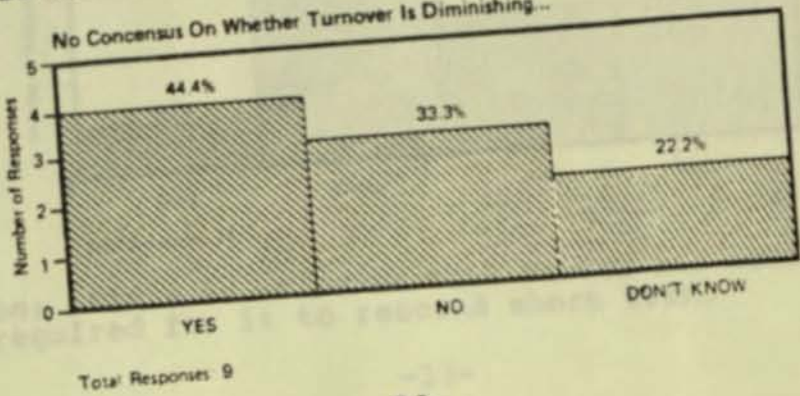
Conclusion: Easy expandibility of Tandem systems encourages customer upgrades. Additional Tandem products would encourage more multi-application customer expansions.

QUESTION: Have you observed much turnover in the Tandem salesforce?

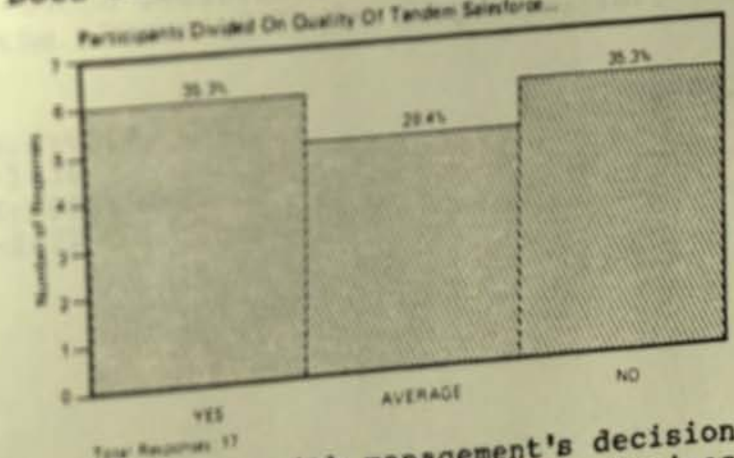


Conclusion: Salesforces and sales management issues are often a problem for companies in transition from one market focus to another. There was no clear indication that the turnover has slowed or that there has been any noticeable improvement in the quality of the salesforce.

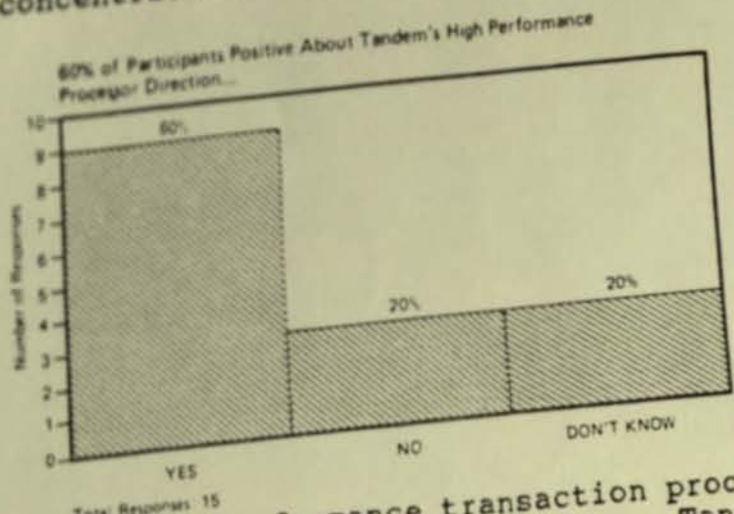
QUESTION: Is this turnover slowing?



QUESTION: Does Tandem have a good, well trained salesforce now?

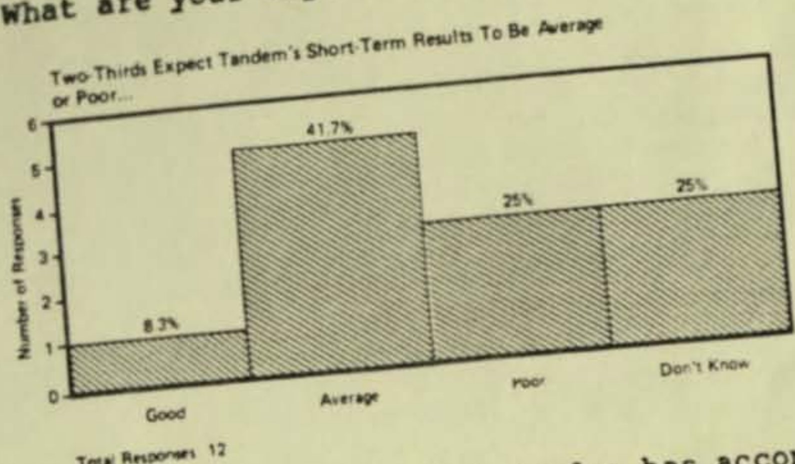


QUESTION: Do you agree with management's decision to concentrate on high-performance business?



Conclusion: The high-performance transaction processing market segment demands fast (and faster) processors. Tandem will continue to increase performance at the high end.

QUESTION: What are your expectations for Tandem short term?



Conclusion: There is no sense that Tandem has accomplished all that is required for it to rebound short term.

Prudential-Bache
Securities

Prudential-Bache Securities makes a primary over-the-counter market in the shares of Tandem Computers, Inc.

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85-602

Tandem
Information Center

Tandem Computers - Company Report
PRUDENTIAL BACHE SECURITIES INC. - Muratore, C.E., et al
12-13-85 (RN=513708)

Tandem Computers
* Company repositing for better profitability and growth nearly complete.

* E.P.S estimates $1.05 in FY86 and $1.50 in FY87.

* Negative E.P.S. comparisons likely in the first half FY86.

* Rating raised to 2-2 from 3-3.

TNDM (21 3/4) -- OTC

Earnings Per Share Fiscal Year Ending			P/E	Ind.		Opinion		Shares O/S	52-Week
9/85	9/86E	9/87E	1986E	Div.	Yield	N	L	(mil.)	Range
$0.82	$1.05	$1.50	20.7X	--	--	2	2	41.6	29-13

DJIA: 1511.24 Priced as of the close, December 12, 1985.
S&P 400: 229.56

Opinion Legend: N = Up to 6 Months, L = 6 to 18 Months
1= Aggressive Purchase, 2 = Accumulate, 3 = Average Performer
4 = Swap, 5 = Sell

INVESTMENT CONCLUSION

We have raised our rating on Tandem stock to 2-2 from 3-3. There are still risks in Tandem's earnings during the next six months, but we believe they are already reflected in the stock's price. Tandem has spent three years grappling with its own coming-of-age problems and a more competitive IBM. The company has made significant progress in three of four critical areas. The progress made to date will improve its earnings performance in fiscal 1986. Our FY86 E.P.S. estimate of $1.05, recently increased from $0.80 per share, is based on these factors:

* Margins have bottomed. Financial controls have already improved gross margins; operating costs are management's fiscal 1986 target. We expect operating margins to improve to 9.3% in FY86 from 8.0% in FY85.

* New product introductions -- both recently announced and expected through fiscal 1986 -- reassert the company's leadership position in the high performance on-line transaction processing market. New disks, operating system and high-end processor will increase transactions per second performance to four to five times that of the TXP when it was introduced. A new high-end processor is expected in Q1, 1986.

* More applications software will facilitate new business. Tandem has finally forged a productive relationship with its growing number of third-party software houses. The new applications will help Tandem close more business.

Tandem needs to create a forceful marketing and sales program to deliver its product message more effectively. This is the major unmet challenge of 1986. It is also the difference between the company's growing at 17%-20% in revenues, which is reflected in our estimates, and 30% per year, as it could with proper implementation.

Management is appropriately cautious and spending will be under tight control throughout fiscal 1986. The first quarter of fiscal 1986 (December, 1985) earnings per share are projected at $0.21, almost 40% below fiscal 1985's first quarter. The March quarter has been a "black hole" for earnings the last few years; we are projecting $0.14 E.P.S. in second quarter FY86, 12% below prior year. A new high-end processor will buoy revenues beginning in the first quarter of calendar 1986. Its major contribution will be to increase the predictability of shipments rather than dramatically accelerate revenue growth. More stable quarterly revenues, however, will lead directly to higher earnings per share.

Our earnings per share estimates are $1.05 for fiscal 1986 and $1.50 for fiscal 1987. Our calendar 1986 E.P.S. estimate is $1.15. Our earnings per shares estimates are based on our increased confidence that Tandem's cost controls and improved product margins are sustainable.

Tandem's Progress Has Been
Significant In Most Key Areas

We have been chronicling Tandem's progress in repositioning its products and the company for a more competitive environment for three years. Tandem faced a particularly difficult transition: the company needed to respond to IBM's increased product and marketing aggressiveness (for Tandem, the IBM 308X mainframe series and 3380 disks, first shipped in volume in 1982), as did every other vendor. Tandem, however, faced all of the problems of a high growth company in adolescence at the same time: poor controls, overspending, R&D bottlenecks and lack of direction in the field organization.

Since then Tandem has:

* Enhanced and broadened its product line. Recent products include a new version of its operating system, Guardian 90, which doubles transactions per second and improves batch performance four to five times. Very sophisticated high performance disk drives, manufactured to Tandem's design by Fujitsu and Hitachi, catapult Tandem into the lead for fast access, high density storage. This is critical to Tandem's on line transaction processing customers and alleviates a performance bottleneck in Tandem's systems.

More products are planned for fiscal 1986, including a new high-end early in the year. We expect that the new processor, along with the recent operating system and disk introductions, will improve overall system performance four to five times. The TXP and EXT will migrate downward in packaging and price, which will give Tandem strong price/performance across its product line. This aggressive price/performance adjustment in the TXP and FXT lines should alleviate a problem Tandem encountered when it introduced the TXP in September, 1983. TXP shipments grew very rapidly, but Tandem was surprised by the fall-off in demand for its older systems as customers unexpectedly viewed the TXP as a replacement for earlier products. This time, new packaging and significant price/performance improvements should position all models well for continued growth.

Tandem gained good control over the productizing of R&D last year; new products will be introduced on a more timely schedule than in the past.

* Inaugurated financial controls and planning in most key areas. The first to show improvement was manufacturing; fourth-quarter fiscal 1985 gross margins climbed to 63% from fiscal 1984's average of 59%. Because of improved efficiencies in assembly and test, the company anticipates that the higher gross margins are sustainable.

The field organization is now the chief target for better efficiency. Two layers of field management have been eliminated; at the same expenditure level, therefore, Tandem will have 20% to 30% more direct salespeople in fiscal 1986. There is considerable effort on instituting better sales forecasting for improved predictability.

We are optimistic that structural changes in the field can improve Tandem's profitability while increasing its effectiveness. Tandem has spent about 40% of revenues on S, G & A; this is 10 percentage points higher than almost every competitor and, we believe, unnecessary. Structural changes can reduce S, G & A as a percent of revenues by two or three percentage points fairly quickly. Our estimates assume a three percentage point decline by fiscal 1987. One structural change which should help both expenses and revenues is the creation of a custom software group at headquarters. In the past, Tandem's local sales offices have taken on sophisticated projects for customers which have absorbed local resources for months, destroying sales productivity. These projects will now be managed by a centralized, revenue-generating group at headquarters, leaving the local sales offices free for selling.

* Established a productive rapport with independent software houses. After a slow start in early 1985, Tandem has taken the initiative to leverage its expanding third-party software house roster with equipment grants, investments and national marketing support where appropriate. It is seeking independents in targeted markets. This is a breakthrough for Tandem, whose actions toward the software houses have been ambivalent until recently. Now, these relationships are getting high level, consistent attention. Applications software is critical to Tandem's ability to quickly and therefore profitably enter new markets. In the next six to 12 months, many new applications packages should be available.

Marketing And Sales The Remaining Unmet Challenge

Whether Tandem's revenues grow at 17%-20%, as in our model, or at 30% depends on how the company directs its sales efforts. The salesforce worldwide will be retrained in the first quarter of calendar 1986 to sell Tandem's existing unique ability to integrate distributed transaction processing with IBM mainframe data bases on-line. Tandem needs a salesforce capable of differentiating its products and targeting appropriate applications.

Whether Tandem is particularly successful at this challenge will be more apparent in the second half of fiscal 1986, when other problem areas have been resolved, the new high-end is shipping and more applications software is available. Tandem's products and their price/performance in on-line transaction processing maintained the company's revenue growth at 27% in fiscal 1984 and 17% in fiscal 1985 despite the changes of direction at the company and a weak economy in 1985. A more focused and disciplined sales organization should be able to do better.

Tandem is emerging from this three-year hiatus in a strong product position:

* Its proprietary solution for the on-line transaction processing market remains the best one for applications requiring over 50 transactions per second.

* Tandem's existing hardware and software platforms will be able to support 1,000 transactions per second, deliverable within the next two years.

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INVESTEXT/COMPUTERS AND OFFICE EQUIPMENT
JANUARY 20, 1986

Tandem Computers - Company Report
(continued)

* Competition, whether from IBM or Stratus, is not functionally equivalent and has not inhibited Tandem's growth. Tandem's own limitations in marketing and selling efficiently have hindered its revenue growth more than competition.

* The value-added in the high performance segment of the transaction processing market is expected to remain high for the rest of this decade at least. The market itself has been validated by IBM, both with its OEM arrangement with Stratus and its own TPF2 operating system software for IBM mainframes.

IBM will continue to win bids against Tandem at IBM shops. But Tandem's higher performance solutions and IBM's own customers' demands for OLTP have forced IBM to span a performance range of 15 to 150 transactions per second with four different, incompatible mainframe software environments. This will ensure Tandem sales growth and protect its product margins.

IBM's marketing of Stratus machines will help IBM in distributed environments -- automated branch banking, retail point-of-sale -- with Stratus processors front-ending IBM mainframes. We expect IBM to win business with this solution. Tandem, however, has a larger performance range with one operating system and more communications and applications software. As IBM begins national marketing of the Stratus processors in first quarter, 1986, we expect Stratus' direct selling efforts within the IBM customer base to diminish. In this context, the selling cycle for Tandem may actually be shortened. Instead of competing with Stratus, then IBM selling IBM equipment, and finally, as a last effort, IBM selling Stratus processors, Tandem may find that it is competing only with IBM. This does not mean that Tandem will win any more bids, but that the decision-making process may be shorter.

Tandem's management has made many of the typical mistakes in the last three years -- missed revenue and earnings targets and over-optimism, for example -- and its credibility with investors has suffered. Tandem's management is bright but young and new to the IBM mainframe world. The areas which the company has improved -- cost controls, product development, software availability -- required a few tries before Tandem found the right solutions. We expect that the marketing and sales direction resolution may also take some time. For this reason, our fiscal 1986 and 1987 revenue projections are not based on a revenue acceleration. We would hope, however, that by fiscal 1987, Tandem's revenue growth would benefit from a more effective sales effort.

Our fiscal 1986 quarterly projections, included in Table 1, reflect a weak first half in revenue gains and a rebound in the second half from new high-end processor shipments and more applications software. Fiscal 1986 revenue growth is projected at 17.4%. Gross margin is 62.5% for the full year. Our projections include strong R&D spending, up 30%, and S,G, & A growth limited to 13%. Pretax margin, at 10.4%, is a substantial improvement over fiscal 1985's 9.0%. The company's cash position is solid at nearly $130 million with less than $5 million in long-term debt and $8 million in long-term capitalized lease obligations.

Table 1
TANDEM COMPUTERS, INC.
Quarterly Income Statement Projections
Fiscal Year Ending September 1986
($ Millions)

Part 1 of 3

	1Q 86E	Percent of Revenue	Percent Change Prior Year	2Q 86E	Percent of Revenue	Percent Change Prior Year
TOTAL REVENUE	$168	100.0%	5.2%	$165	100.0%	12.6%
Product	136	81.0%	1.4%	132	80.0%	9.9%
Service	32	19.0%	25.4%	33	20.0%	25.0%
COST OF REVENUES	64	38.1%	3.2%	63	38.2%	9.2%
Gross Margin	61.9%			61.8%		
RESEARCH and DEVELOPMENT	21	12.5%	38.8%	22	13.3%	28.8%
S,G, and A	70	41.7%	16.7%	72	43.6%	16.1%
OPERATING INCOME	13	7.7%	-42.2%	8	4.8%	-17.6%
INTEREST, Net	2	1.2%	5.9%	2	1.2%	27.1%
PRETAX INCOME	15	8.9%	-38.5%	10	6.1%	-11.3%
TAXES	6.0	3.6%	-42.1%	4.0	2.4%	-9.8%
Tax Rate	42.0%			40.0%		
NET INCOME	9.0	5.4%	-35.8%	6.0	3.6%	-12.3%
EARNINGS PER SHARE	$0.21		-37.0%	$0.14		-12.6%
Average Number of Shares Outstanding	42.0		1.7%	42.3		0.3%

	3Q 86E	Percent of Revenue	Percent Change Prior Year	4Q 86E	Percent of Revenue	Percent Change Prior Year
TOTAL REVENUE	$190	100.0%	31.8%	$210	100.0%	20.8%
Product	155	81.6%	32.6%	173	82.4%	20.1%
Service	35	18.4%	28.2%	37	17.6%	24.1%
COST OF REVENUES	70	36.8%	24.7%	78	37.1%	21.3%
Gross Margin	63.2%			62.9%		
RESEARCH and DEVELOPMENT	24	12.6%	33.1%	26	12.4%	21.8%
S,G, and A	75	39.5%	7.9%	80	38.1%	12.9%
OPERATING INCOME	21	11.1%	NM	26	12.4%	50.0%
INTEREST, Net	2	1.1%	54.1%	2	1.0%	32.5%
PRETAX INCOME	23	12.1%	NM	28	13.3%	48.6%
TAXES	9.2	4.8%	NM	11.2	5.3%	45.0%
Tax Rate	40.0%			40.0%		
NET INCOME	13.8	7.3%	477.9%	17	8.0%	51.1%
EARNINGS PER SHARE	$0.32		465.7%	$0.39		45.6%
Average Number of Shares Outstanding	42.8		2.2%	43.2		3.8%

Part 3 of 3

	FY 86E	Percent of Revenue	Percent Change Prior Year
TOTAL REVENUE	$733	100.0%	17.4%
Product	596	81.3%	15.7%
Service	137	18.7%	25.7%
COST OF REVENUES	275	37.5%	14.5%
Gross Margin	62.5%		
RESEARCH and DEVELOPMENT	93	12.7%	29.9%
S,G, and A	297	40.5%	13.2%
OPERATING INCOME	68	9.3%	35.8%
INTEREST, Net	8.0	1.1%	27.6%
PRETAX INCOME	76	10.4%	34.9%
TAXES	30.4	4.1%	38.3%
Tax Rate	40.0%		
NET INCOME	46	6.2%	32.7%
EARNINGS PER SHARE	$1.07		30.2%
Average Number of Shares Outstanding	42.6		1.9%

Source: Prudential-Bache Securities, Inc.

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INVESTEXT/COMPUTERS AND OFFICE EQUIPMENT
JANUARY 20, 1986

Tandem Computers - Company Report
(continued)

Table 2
TANDEM COMPUTERS, INC.
Quarterly Income Statement Projections
Fiscal Year Ending September
($ Millions)

Part 1 of 2

	FY84A	Percent of Revenue	Percent Change Prior Year	FY85A	Percent of Revenue	Percent Change Prior Year
TOTAL REVENUE	$532.6	100.0%	27.3%	$624.1	100.0%	17.2%
Product	448.6	84.2%	24.6%	515.1	82.5%	14.8%
Service	84.0	15.8%	44.5%	109.0	17.5%	29.8%
COST OF REVENUES	218.8	41.1%	29.7%	240.1	38.5%	9.8%
Gross Margin	58.9%			61.5%		
RESEARCH and Development	52.5	9.9%	34.1%	71.6	11.5%	36.3%
S,G, and A	210.2	39.5%	30.9%	262.3	42.0%	24.8%
OPERATING INCOME	51.1	9.6%	2.7%	50.1	8.0%	-2.0%
INTEREST, Net	5.2	1.0%	610.0%	6.3	1.0%	20.6%
PRETAX INCOME	56.3	10.6%	11.5%	56.4	9.0%	0.1%
INCOME TAXES	23.1	4.3%	17.2%	22.0	3.5%	-4.9%
Tax Rate	41.0%			39.0%		
NET INCOME	33.2	6.2%	7.8%	34.4	5.5%	3.5%
EARNINGS PER SHARE	$0.80(*)		6.2%	$0.82		2.5%
Average Number of Shares Outstanding	41.4		1.5%	41.8		1.0%

(*) Does not include $0.24 accumulated DISC tax reversal.

PERFORMANCE RATIOS FY84A FY85A

Pretax Profitability	0.106	0.090
Asset Turnover	1.161	1.184
Pretax Return on Assets	0.123	0.107
Leverage	1.337	1.325
Pretax Return on Average Equity	0.164	0.142
Tax Retention Rate	0.590	0.610
Implied Growth Rate	0.097	0.086
Inventory Turnover	2.5x	2.8x
Inventories in Weeks	21.2 Weeks	18.6 Weeks
Receivables in Days	91.1 Days	90.6 Days

Source: Tandem Computers, Inc.
Prudential-Bache Securities, inc.

Source: Tandem Computers, Inc.
Prudential-Bache Securities, Inc.

Table 2
TANDEM COMPUTERS, INC.
Quarterly Income Statement Projections
Fiscal Year Ending September
($ Millions)

Part 2 of 2

	FY86E	Percent of Revenue	Percent Change Prior Year	FY87E	Percent of Revenue	Percent Change Prior Year
TOTAL REVENUE	$733	100.0%	17.4%	$880	100.0%	20.1%
Product	596	81.3%	15.7%	710	80.7%	19.1%
Service	137	18.7%	25.7%	170	19.3%	24.1%
COST OF REVENUES	275	37.5%	14.5%	326	37.0%	18.5%
Gross Margin	62.5%			63.0%		
RESEARCH and Development	93	12.7%	29.9%	106	12.0%	14.0%
S,G, and A	297	40.5%	13.2%	343	39.0%	15.5%
OPERATING INCOME	68	9.3%	35.8%	105	11.9%	54.4%
INTEREST, Net	8	1.1%	27.6%	4	0.5%	-50.0%
PRETAX INCOME	76	10.4%	34.9%	109	12.4%	43.4%
INCOME TAXES	30.4	4.1%	38.3%	43.6	5.0%	43.4%
Tax Rate	40.0%			40.0%		
NET INCOME	45.6	6.2%	32.7%	65.4	7.4%	43.3%
EARNINGS PER SHARE	$1.07		30.2%	$1.51		40.8%
Average Number of Shares Outstanding	42.6		1.9%	43.4		1.9%

(*) Does not include $0.24 accumulated DISC tax reversal.

PERFORMANCE RATIOS	FY86E	FY87E
Pretax Profitability	0.104	0.124
Asset Turnover	1.226	1.254
Pretax Return on Assets	0.127	0.155
Leverage	1.333	1.367

Pretax Return on Average Equity	0.170	0.212
Tax Retention Rate	0.600	0.600
Implied Growth Rate	0.102	0.127
Inventory Turnover	3.4x	3.5x
Inventories in Weeks	15.5 Weeks	14.8 Weeks
Receivable in Days	86.2 Days	83.6 Days

Source: Tandem Computers, Inc.
Prudential-Bache Securities, Inc.

Prudential-Bache Securities makes a primary over-the-counter market in the shares of Tandem Computer.

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The 100 Leading U.S. IS Companies

1987 US RANK	1987 WORLD RANK	1986 WORLD RANK	COMPANY	1987 IS REVENUE	1986 IS REVENUE	IS REV % CHANGE	1987 TOTAL REVENUE
1	1	1	IBM	50,485.7	47,685.0	5.9	54,217.0
2	2	3	Digital Equipment Corp.	10,391.3	8,414.3	23.5	10,391.3
3	3	2	Unisys Corp.	8,742.0	8,186.0	6.8	9,712.9
4	8	9	NCR Corp.	5,075.7	4,386.6	15.7	5,640.7
5	9	7	Hewlett-Packard Co.	5,000.0	4,500.0	11.1	8,090.0
6	12	12	Wang Laboratories Inc.	3,045.7	2,668.9	14.1	3,045.7
7	13	18	Apple Computer Inc.	3,041.2	2,031.0	49.7	3,041.2
8	15	11	Control Data Corp.	3,000.9	3,004.7	-0.1	3,366.5
9	19	15	Xerox Corp.	2,415.0	2,100.0	15.0	14,895.0
10	21	—	Honeywell Bull Inc.	2,059.0	1,890.0	8.9	2,059.0
11	23	16	AT&T Corp.	2,000.0	2,085.0	-4.1	33,598.0
12	24	23	TRW Inc.	1,960.0	1,625.0	20.6	6,821.2
13	25	24	Tandy Corp.	1,692.4	1,560.2	8.5	3,654.7
14	29	36	Amdahl Corp.	1,505.2	966.3	55.8	1,505.2
15	30	27	Automatic Data Processing Inc.	1,467.0	1,298.1	13.0	1,467.0
16	31	31	Electronic Data Systems	1,440.5	1,125.9	27.9	4,435.9
17	32	28	Data General Corp.	1,303.9	1,287.6	1.3	1,303.9
18	35	29	McDonnell Douglas Corp.	1,241.8	1,189.8	4.4	13,344.5
19	37	54	Compaq Computer Corp.	1,224.1	625.2	95.8	1,224.1
20	39	40	Comdisco Inc.	1,153.0	985.0	17.1	1,234.0
21	41	35	Computer Sciences Corp.	1,133.8	977.7	16.0	1,133.8
22	43	44	Tandem Computers Inc.	1,089.6	845.3	28.9	1,089.6
23	44	50	Seagate Technology	1,075.7	709.4	51.6	1,075.7
24	46	58	Zenith Electronics Corp.	1,040.0	548.0	89.9	2,363.0
25	47	49	National Semiconductor Corp.	985.0	725.0	35.9	2,067.6
26	49	43	Prime Computer Inc.	960.9	860.2	11.7	960.9
27	53	38	General Electric Co.	800.0	800.0	0.0	40,515.0
28	54	48	Telex Corp.	788.9	728.2	8.3	877.8
29	55	46	Commodore International Ltd.	785.0	800.0	-1.9	815.5
30	56	76	Sun Microsystems Inc.	755.9	342.7	120.6	755.9
31	57	51†	Storage Technology Corp.	750.0	696.0	7.8	750.0
32	58	59	Arthur Andersen & Co.	748.9	546.0	37.2	2,481.9
33	59	47	Texas Instruments Inc.	740.0	750.0	-1.3	5,594.5
34	60	52	Motorola Inc.	724.9	694.0	4.4	6,707.0
35	61	56	Cray Research Inc.	687.3	596.7	15.2	687.3
36	63	53	Martin Marietta Corp.	685.7	659.4	4.0	5,418.3
37	66	93	Computer Associates International Inc.	648.8	264.9	144.9	648.8
38	67	55	Intergraph Corp.	641.1	605.7	5.8	641.1
39	68	81	Bell Atlantic Corp.	634.9	310.0	104.8	10,298.4
40	71	61	Computervision Corp.	564.0	494.7	14.0	564.0
41	72	69	Apollo Computer Inc.	553.6	391.7	41.3	553.6
42	73	57	Lockheed Corp.	553.0	497.0	11.3	11,321.0
43	78	96	Microsoft Corp.	456.7	260.2	75.5	456.7
44	79	67	Xidex Corp.	455.7	418.3	8.9	599.6
45	80	97	3M	455.0	400.0	13.7	9,429.0
46	81	64	Harris Corp.	446.0	464.0	-3.9	2,083.9
47	84	90	Continental Information Systems Corp.	405.4	282.9	43.3	420.8
48	85	99	Emhart Corp.	404.8	356.0	13.7	2,454.5
49	87	108	Wyse Technology	396.2	228.0	73.8	396.2
50	88	89	Lotus Development Corp.	395.6	283.0	39.9	395.6

All currency figures are in millions. NA = not available.

TAL JE	IS AS % OF TOTAL	1987 EMPLS	% CHANGE FROM 1986	IS REV PER EMPL* ($ THOU)	R&D CORP 1987	R&D AS % OF TOTAL REV	NET INCOME	% RETURN ON ASSETS	FISCAL YEAR END	LOCA-TION
.0	93.1	389,384	(3.5)	139.2†	5,434.0	10.0	5,258.0	8.3	Dec.	N.Y.
.3	100.0	116,800	15.6	89.0	1,138.8	11.0	1,284.3	13.6	June	Mass.
.9	90.0	92,500	(5.9)	105.0†	1,318.5	13.6	578.0	5.8	Dec.	Mich.
.7	90.0	62,000	0.0	91.0†	355.9	6.3	419.3	10.0	Dec.	Ohio
.0	61.8	82,000	0.0	98.7†	901.0	11.1	644.0	7.9	Oct.	Calif.
.7	100.0	30,855	(.5)	98.7	232.0	7.6	94.5	3.4	June	Mass.
.2	100.0	7,927	33.5	383.7	203.3	6.7	280.5	17.3	Sept.	Calif.
.5	89.1	34,500	(2.8)	97.6†	389.0	11.6	19.3	.7	Dec.	Minn.
.0	16.2	99,032	(1.3)	150.4†	722.0	4.9	578.0	5.0	Dec.	Conn.
.0	100.0	20,500	(6.8)	100.4	216.0	10.5	17.4	NA	Dec.	Minn.
.0	6.0	303,000	(2.6)	110.9†	2,453.0	7.3	2,044.0	5.3	Dec.	N.Y.
1.2	28.7	77,931	(.9)	87.5†	1,874.0	27.5	243.4	5.6	Dec.	Ohio
4.7	46.3	36,000	0.0	101.5†	NA	NA	289.8	13.0	June	Texas
5.2	100.0	7,600	5.6	198.1	178.9	11.9	146.0	9.7	Dec.	Calif.
7.0	100.0	22,000	10.0	66.7	59.6	4.1	149.8	9.4	June	N.J.
5.9	100.0	43,433	(4.3)	102.1†	NA	NA	323.1	10.9	Dec.	Texas
3.9	100.0	15,640	(.4)	83.4	164.7	12.6	-111.3	—	Sept.	Mass.
4.5	9.3	112,400	6.3	118.7†	647.7	4.9	313.0	3.7	Dec.	Mo.
4.1	100.0	4,000	110.5	306.0	47.1	3.9	136.0	15.1	Dec.	Texas
4.0	93.4	1,130	21.5	1,092.4	NA	NA	23.0	.8	Sept.	Ill.
3.8	100.0	18,400	6.4	61.6	NA	NA	40.5	6.5	March	Calif.
9.6	100.0	7,176	19.2	151.8	120.8	11.1	101.9	9.6	Sept.	Calif.
75.7	100.0	23,490	97.9	45.8	40.9	3.8	115.3	11.7	June	Calif.
53.0	44.0	35,000	(5.4)	67.5†	103.4	4.4	-19.1	—	Dec.	Ill.
67.6	47.6	38,000	23.4	54.4†	220.0	10.6	6.6	.4	May	Calif.
60.9	100.0	8,818	2.3	109.0	109.7	11.4	64.8	4.9	Dec.	Mass.
15.0	2.0	302,000	15.9	134.2†	1,194.0	3.0	2,915.0	4.7	Dec.	Conn.
77.8	89.9	8,289	5.6	105.9†	50.8	5.8	56.6	8.6	March	Okla.
15.5	96.3	3,150	(.8)	249.2	16.5	2.0	37.1	6.4	June	Pa.
55.9	100.0	5,465	72.8	138.3	101.5	13.4	48.0	7.5	June	Calif.
50.0	109.0	8,865	(5.5)	84.6	60.0	8.0	26.0	3.3	Dec.	Colo.
481.9	30.2	40,000	10.7	62.0†	NA	NA	NA	NA	Aug.	Ill.
594.5	13.2	77,984	.9	71.7†	428.0	7.7	308.5	7.3	Dec.	Texas
707.0	10.8	97,700	3.5	68.6†	524.0	7.8	308.0	5.8	Dec.	Ill.
587.3	100.0	4,308	7.7	159.5	108.8	15.8	147.1	16.3	Dec.	Minn.
418.3	12.7	68,000	3.3	79.6†	220.0	4.1	230.6	8.2	Dec.	Md.
648.8	100.0	4,000	66.7	162.2	81.1	12.5	60.2	7.7	March	N.Y.
641.1	100.0	6,300	11.5	101.8	67.5	10.5	69.9	9.9	Dec.	Ala.
298.4	6.2	80,950	.9	127.2†	NA	NA	1,240.4	5.8	Dec.	Pa.
564.0	100.0	4,575	(4.1)	123.3	60.1	10.7	19.5	4.0	Dec.	Mass.
553.6	100.0	3,992	10.9	138.7	61.1	11.0	21.7	4.9	Dec.	Mass.
321.0	4.9	99,300	2.5	114.0†	549.0	4.8	421.0	7.0	Dec.	Calif.
456.7	100.0	1,996	33.1	228.8	50.1	11.0	93.0	32.3	June	Wash.
599.6	76.0	7,299	12.3	82.1†	10.7	1.8	-48.9	—	June	Calif.
,429.0	4.8	82,405	.5	114.4†	618.0	6.5	918.0	11.4	Dec.	Minn.
,083.9	21.4	23,200	(13.1)	89.8	117.7	5.6	92.2	5.4	June	Fla.
420.8	96.3	900	137.5	450.4	NA	NA	15.1	.8	Feb.	N.Y.
,454.5	16.5	30,548	(10.6)	80.3†	39.8	1.6	106.5	5.2	Dec.	Conn.
396.2	100.0	3,600	137.5	110.1	21.1	5.3	25.5	6.8	March	Calif.
395.6	100.0	2,119	51.4	186.7	58.4	14.8	72.0	22.7	Dec.	Mass.

*For companies with more than 95% of revenues from IS.

†Based on total corporate revenues.

The 100 Leading U.S. IS Companies

1987 US RANK	1987 WORLD RANK	1986 WORLD RANK	COMPANY	1987 IS REVENUE	1986 IS REVENUE	IS REV % CHANGE	1987 TOTAL REVENUE
51	89	71	Shared Medical Systems Corp.	390.7	374.9	4.2	390.7
52	90	83	Convergent Technologies Inc.	384.8	305.8	25.8	384.8
53	92	106	Tandon Corp.	374.0	242.8	54.0	374.0
54	94	125	MiniScribe Corp.	362.5	184.9	96.0	362.5
55	95	78	Diebold Inc.	345.5	325.5	6.1	439.1
56	96	87	MAI Basic Four Inc.	334.2	287.9	16.1	334.2
56	97	73	Dataproducts Corp.	334.2	350.8	-4.7	334.2
58	98	79	Datapoint Corp.	320.7	325.0	-1.3	320.7
59	99	74	Tektronix Inc.	320.0	350.0	-8.6	1,388.9
60	100	86	Gould Inc.	299.3	290.0	3.2	933.4
61	102	98	Eastman Kodak Co.	290.0	250.0	16.0	13,305.0
62	103	133	AST Research Inc.	289.8	168.9	71.6	289.8
63	104	110	Micropolis Corp.	288.3	213.1	35.3	288.3
64	106	158	Genicom Corp.	284.9	133.8	112.9	302.5
65	108	112	Ashton-Tate	267.3	210.7	26.9	267.3
66	109	84	Boeing Co.	266.3	300.0	-11.2	15,355.0
67	110	109	Concurrent Computer Corp.	265.3	227.7	16.5	265.3
68	111	100	Recognition Equipment Inc.	265.2	246.6	7.5	265.2
69	112	120	Management Science America Inc.	258.5	193.5	33.6	258.5
70	114	111	Gerber Scientific Inc.	254.8	213.1	19.6	254.8
71	116	116	Atari	250.0	200.0	25.0	493.2
72	119	107	Schlumberger Ltd.	240.0	240.0	0.0	4,727.0
73	120	147	Maxtor Corp.	239.4	148.0	61.8	239.4
74	121	114	Reynolds & Reynolds Co.	237.9	204.3	16.4	572.1
75	123	95	Paradyne Corp.	232.6	261.1	-10.9	232.6
76	125	129	Bolt Beranek and Newman Inc.	223.1	172.5	29.3	279.8
77	126	128	Mentor Graphics Corp.	221.8	173.5	27.8	221.8
78	127	117	Intel Corp.	220.0	200.0	10.0	1,907.1
79	130	121	Micom Systems Inc.	212.5	192.5	10.4	212.5
80	131	131	AGS Computers Inc.	212.3	171.0	24.1	496.7
81	132	178	Everex Systems Inc.	210.1	106.4	97.5	210.1
82	133	134	Cullinet Software Inc.	203.9	166.9	22.2	203.9
83	134	126	Software AG Systems Inc.	203.0	180.0	12.8	203.0
84	135	194	Novell Inc.	202.1	113.6	77.9	202.1
85	136	137	Digital Communications	200.6	162.2	23.7	200.6
86	137	115	Dun & Bradstreet Corp.	200.0	200.0	0.0	3,359.2
86	138	156	Price Waterhouse	200.0	135.0	48.1	1,804.0
88	139	185	Oracle Corp.	198.0	88.0	125.0	198.0
89	140	141	The Ultimate Corp.	197.7	157.6	25.4	197.7
89	141	122	General DataComm Industries Inc.	197.7	189.2	4.5	197.7
91	142	192	3Com Corp.	197.5	121.1	63.1	197.5
92	144	113	Sterling Software Inc.	196.9	209.6	-6.1	196.9
93	147	119	Decision Data Computer Corp.	191.4	195.1	-1.9	191.4
94	148	166	Stratus Computer Inc.	184.1	124.6	47.7	184.1
95	149	135	ISC Systems Corp.	181.4	162.4	11.7	181.4
96	150	145	Policy Management Systems Corp.	180.0	151.0	19.2	180.0
97	151	169	Quantum Corp.	178.3	116.5	53.0	178.3
98	152	142	HBO & Co.	175.2	155.0	13.0	175.2
99	153	193	Touche Ross	175.0	NA	NA	1,450.0
100	154	155	American Management Systems Inc.	174.3	135.5	28.6	174.3

All currency figures are in millions. NA = not available.

				R&D					
IS AS % OF TOTAL	1987 EMPLS	% CHANGE FROM 1986	IS REV PER EMPL* ($ THOU)	CORP 1987	AS % OF TOTAL REV	NET INCOME	% RETURN ON ASSETS	FISCAL YEAR END	LOCA-TION
100.0	4,300	16.2	90.9	37.9	9.7	45.3	14.7	Dec.	Pa.
100.0	3,200	28.9	120.3	33.6	8.7	-32.6	—	Dec.	Calif.
100.0	2,800	21.7	133.6	17.5	4.7	10.3	5.6	Dec.	Calif.
100.0	4,971	87.0	72.9	19.8	5.5	31.1	11.4	Dec.	Colo.
78.7	4,878	(8.3)	90.0†	21.9	5.0	35.8	8.1	Dec.	Ohio
100.0	3,367	11.8	99.3	22.9	6.8	23.9	10.1	Sept.	Calif.
100.0	3,600	(14.3)	92.8	25.6	7.7	-3.6	—	March	Calif.
100.0	2,810	(22.4)	114.1	10.5	3.3	15.3	3.8	July	Texas
23.0	16,879	(2.7)	82.3†	207.5	14.9	25.7	2.6	May	Ore.
32.1	10,126	(4.6)	92.2†	94.3	10.1	-95.6	—	Dec.	Ill.
2.2	124,400	2.4	107.0†	992.0	7.5	1,178.0	8.1	Dec.	N.Y.
100.0	1,525	90.6	190.0	13.5	4.7	8.3	4.8	June	Calif.
100.0	2,385	46.9	120.9	21.8	7.7	27.3	10.4	Dec.	Calif.
94.2	3,600	44.0	84.0†	14.9	4.9	12.6	5.5	Dec.	Va.
100.0	1,200	20.0	222.8	28.0	10.5	43.1	17.4	Jan.	Calif.
1.7	136,100	18.3	112.8†	824.0	5.4	480.0	3.8	Dec.	Wash.
100.0	2,789	(3.0)	95.1	28.8	10.9	12.9	4.9	July	N.J.
100.0	2,859	(1.6)	92.8	11.2	4.2	11.8	4.4	Oct.	Texas
100.0	2,700	2.2	95.7	51.4	19.9	-71.0	—	Dec.	Ga.
100.0	1,850	8.8	137.7	17.7	7.0	28.0	11.8	April	Conn.
50.7	3,850	208.0	128.1†	18.0	3.7	57.4	11.0	Dec.	Calif.
5.1	50,000	0.0	94.5	351.8	7.4	282.6	4.2	Dec.	N.Y.
100.0	2,500	64.0	95.8	20.1	8.4	16.1	5.9	March	Calif.
41.6	5,704	5.1	100.3†	NA	NA	28.0	7.0	Sept.	Ohio
100.0	3,115	3.8	74.7	19.0	8.2	-2.6	—	Dec.	Fla.
79.7	2,850	14.9	98.2†	19.0	6.8	-6.1	—	June	Mass.
100.0	1,200	32.0	184.8	24.4	10.9	20.3	8.9	Dec.	Ore.
11.5	19,200	2.7	99.3†	259.8	13.6	248.1	9.6	Dec.	Calif.
100.0	2,159	2.2	98.4	23.9	11.3	6.8	3.2	March	Calif.
42.7	3,439	11.3	144.4†	12.7	2.6	14.2	6.4	Dec.	N.J.
100.0	1,300	188.9	161.6	12.6	6.0	10.2	9.4	July	Calif.
100.0	2,427	35.1	84.0	53.5	26.2	-23.3	—	April	Mass.
100.0	1,800	2.9	112.8	50.0	24.6	20.0	8.7	May	Va.
100.0	1,240	93.7	163.0	11.1	5.5	21.5	15.4	Oct.	Utah
100.0	1,307	23.8	153.5	24.3	12.1	34.3	16.0	June	Ga.
6.0	60,000	3.5	55.9†	NA	NA	393.0	11.8	Dec.	N.Y.
11.1	35,100	7.0	51.4†	NA	NA	NA	NA	June	N.Y.
100.0	1,597	106.1	124.0	23.2	11.7	29.7	16.0	May	Calif.
100.0	710	67.5	278.5	2.0	1.0	16.7	8.7	April	N.J.
100.0	2,623	.7	75.4	25.8	13.0	-8.3	—	Sept.	Conn.
100.0	1,115	119.9	177.1	17.8	9.0	18.0	10.4	May	Calif.
100.0	2,300	(8.0)	85.6	17.3	8.8	5.9	2.7	Sept.	Texas
100.0	1,545	(3.5)	123.9	10.9	5.7	-23.3	—	Nov.	Pa.
100.0	1,224	14.5	150.4	18.9	10.3	19.4	13.3	Dec.	Mass.
100.0	1,800	0.0	100.8	14.6	8.0	8.1	5.6	June	Wash.
100.0	2,577	1.1	69.8	30.7	17.1	17.1	6.1	Dec.	S.C.
100.0	590	(9.8)	302.2	11.4	6.4	8.1	5.2	March	Calif.
100.0	1,772	1.2	98.9	13.0	7.4	13.3	13.1	Dec.	Ga.
12.1	30,000	0.0	48.3†	NA	NA	NA	NA	Aug.	N.Y.
100.0	2,300	37.3	75.8	6.3	3.6	7.6	9.2	Dec.	Va.

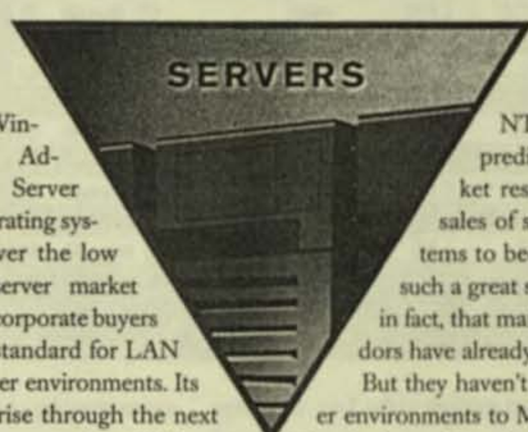
*For companies with more than 95% of revenues from IS.

†Based on total corporate revenues.

UNIX Takes the HIGH ROAD

UNIX vendors are adding muscle to enterprise servers.

By Philip J. Gill



Microsoft's Windows NT Advanced Server (NTAS) operating system took over the low end of the server market last year, as corporate buyers transformed it into the de facto standard for LAN and departmental application server environments. Its popularity will only continue to rise through the next year, taking market share in the one- to four-CPU symmetric multiprocessor (SMP) market away from UNIX, Novell's NetWare, and other alternatives. Consequently, sales of NT servers will grow 60% next year, predicts the Stamford, Conn.-based market research firm Gartner Group, causing sales of servers running other operating systems to become relatively flat. NT looks to be such a great success in the low-end server market, in fact, that many analysts believe UNIX server vendors have already conceded that space to NT.

But they haven't conceded production-oriented server environments to Microsoft/Intel platforms. In fact, the Framingham, Mass.-based market researcher International Data Corp. (IDC) estimates that UNIX enterprise servers alone represented an $18 billion worldwide market in 1995, and that they will maintain an annual growth rate of 20% or more for the next few years, due in large part to the continuing adoption of client/server computing for both new applications and the rehosting of old, reengineered apps. Hewlett-Packard proved its mettle again last year, growing its server revenues 36% to $3.65 billion. In contrast, IBM's server sales–which include the AS/400–grew a more moderate 12% to $6.47 billion.

Although mainframe sales are growing as users replace existing legacy systems with new big-iron technology like CMOS, UNIX servers are taking potential market share from large-system vendors. Carl Stolle, director of server marketing for Sun Microsystems, believes UNIX is growing

What Users Want

Digital Equipment enjoyed what its VP of AlphaServer business Pauline Nist characterizes as surprisingly strong server sales in 1995. She credit Digital with knowing what customers really want:

On users, she says: "Users are finally catching up with the performance curve. We're beginning to see deployments of very large databases and data warehouses that fully exploit the capabilities of a 64-bit architecture."

On NT versus UNIX: "We think the market is validating our multiple operating system approach. Our research shows that by the year 2000, 95% of our customers will have both NT and UNIX installed in their enterprise."

On hardware technologies: "SMP and clustering are complementary capabilities. SMP provides more performance, while clustering provides redundancy and availability without paying the premium of hardware fault tolerance."

Pauline Nist, Vice President, AlphaServer Business, Digital Equipment

at the expense of legacy systems, including IBM's MVS mainframe standard-bearer.

After UNIX, says Gene Lee, research director for IDC's UNIX market service in Mountain View, Calif., the largest single server platform in use today remains the AS/400, larger than any single flavor of UNIX. Together, all UNIX systems and the AS/400 constitute more than 50% of the entire server market, according to IDC. Still, analysts and vendors view UNIX and NT as the two key operating systems for the long term.

Top Server Suppliers

Calendar year 1995 results ($ millions)

Rank	Company (DTM 100 Rank)	Country	Server revenue	Total IT revenue	Server rev. as % of total IT revenue	Net income
1	**IBM** (1)	U.S.	$6,474.6	$71,940.0	9.0%	$4,178.0
2	**Hewlett-Packard** (3)	U.S.	3,650.2	26,073.0	14.0%	2,433.0
3	**AT&T** (9)	U.S.	3,529.1	11,384.1	31.0%	139.0
4	**Compaq Computer** (6)	U.S.	3,256.0	14,800.0	22.0%	789.0
5	**NEC** (4)	Japan	2,515.5	19,350.0	13.0%	700.0
6	**Tandem** (43)	U.S.	1,846.2	2,285.0	80.8%	107.5
7	**Toshiba** (10)	Japan	1,820.8	11,380.3	16.0%	850.0
8	**Digital Equipment** (7)	U.S.	1,689.4	14,439.5	11.7%	431.0
9	**Fujitsu** (2)	Japan	1,607.9	26,798.0	6.0%	671.0
10	**Siemens Nixdorf** (12)	Germany	1,226.3	8,951.0	13.7%	16.1
11	**Mitsubishi** (28)	Japan	870.5	4,145.2	21.0%	N/A
12	**Motorola** (36)	U.S.	773.3	2,974.1	26.0%	1,781.0
13	**Sun Microsystems** (16)	U.S.	650.0	6,500.0	10.0%	447.0
14	**Silicon Graphics** (39)	U.S.	609.8	2,540.8	24.0%	237.0
15	**Apple Computer** (11)	U.S.	568.9	11,378.0	5.0%	167.0
16	**Hitachi** (5)	Japan	486.2	16,208.1	3.0%	N/A
17	**Data General** (62)	U.S.	457.9	1,205.0	38.0%	-66.2
18	**Groupe Bull** (21)	France	424.0	5,300.0	8.0%	61.0
19	**Wang Laboratories** (69)	U.S.	304.4	1,095.0	27.8%	-81.4
20	**Olivetti** (18)	Italy	295.7	6,035.0	4.9%	N/A
21	**Stratus Computer** (-)	U.S.	276.4	588.0	47.0%	17.0
22	**Samsung** (57)	Korea	161.0	1,400.0	11.5%	N/A
23	**Dell Computer** (22)	U.S.	159.0	5,300.0	3.0%	272.0
24	**Sequent** (-)	U.S.	156.7	540.3	29.0%	35.1
25	**Control Data** (-)	U.S.	155.0	455.0	34.0%	9.0

Servers include traditional low-to-midrange multiuser systems.

Source: DATAMATION

MAINFRAME SUBS, APP SERVERS

Vendors and analysts say a number of familiar factors will continue to drive server sales. First, corporate IS shops continue to turn to UNIX-based enterprise servers to replace mainframes as they move from custom to packaged applications. Stolle says Sun server customers are turning from mainframes and legacy applications to packaged business applications such as SAP's R/3 integrated manufacturing and financial package and PeopleSoft's human resources and accounting software, both of which run on UNIX systems. Other application categories driving sales are customer call-management systems and, of course, Internet and intranet applications.

Nigel Ball, director of server marketing for Hewlett-Packard's General Systems division in Cupertino, Calif., expects HP's already robust mainframe replacement sales to pick up steam over the next few years as many information technology shops finally confront the Year 2000 problem. Come January 1, 2000, existing mainframe-based legacy applications that have only a two-digit date field will break down, wreaking havoc on user organizations if something isn't done to repair or replace them. Ball and others expect that the cost of repairing existing legacy applications will be the proverbial straw that breaks down many an IS shop's resistance to migrating their core, mission-critical business applications off proprietary mainframes to high-end UNIX systems, which will be configured to run both as host-centric or client/ server systems.

George Weiss, director of research for distributed computing at the Gartner Group, says that UNIX servers continue to win acceptance in IS departments as vendors continue to improve system availability, reliability, serviceability, manageability, and other abilities traditionally required by mainframe users.

INTERNET FORCES HARDWARE BUYS

The second factor that will continue to drive server sales over the next year or two is the explosive growth of Internet and World Wide Web technologies, particularly when applied to internal intranet sites. "When people talk of the Internet, they usually talk about the software companies," says IDC's Lee. "But software companies aren't making money [around the Internet]. The only people who are actually making money are the hardware vendors. For instance, Sun CEO Scott McNealy has stated publicly that Sun doesn't generate any profit from licensing its wildly popular Java development environment. Rather, Java sales are spurring growth of Sun's Netra Internet servers. Sun's server revenues grew 21.5% to $650 million in 1995.

Unlike mission-critical business applications, which tend to run on high-end SMP boxes, intranet development will spur sales of low-end and midrange servers. Analysts predict intranet growth will drive sales of one- to eight-CPU SMP sys-

ILLUSTRATION BY BETSY HAYES

tems, most of which will run NT. It also means that the best long-term strategy for a server vendor is to support both NT and UNIX, and to provide tools with which to integrate the two. Although UNIX purists like Sun may abhor such a thought, HP and Digital Equipment believe they're offering customers what they want. "By the year 2000, over 95% of our customers will have both UNIX and NT installed," says Pauline Nist, DEC's vice president of Alpha business.

UNIX CONTINUES TO SCALE

To add performance, the three largest UNIX-based server vendors–HP, IBM, and Sun, according to IDC–are introducing long-awaited 64-bit systems, larger SMP configurations, and clustering. Sun this spring introduced its Ultra Enterprise server family, based on the 64-bit UltraSPARC RISC chipset. HP and IBM should release their 64-bit systems sometime later this year, says Jean Bozman, an IDC UNIX market analyst. HP will use its 64-bit PA-8000 chip, IBM a 64-bit implementation of its PowerPC architecture.

One server vendor is already there. DEC has been shipping its AlphaServer products, based on the 64-bit Alpha chip, for more than a year now. Now that major database vendors like Informix, Oracle, and Sybase have come on board, users will have some 3,000 to 4,000 applications that can exploit the underlying 64-bit architecture, says Nist. Digital experienced surprisingly strong server sales in 1995, reporting 60% growth in AlphaServers running UNIX and 150% growth in NT servers, according to Nist. The once-troubled company grew its total server revenues a healthy 44% to $1.69 billion.

Don't be fooled into thinking that 64-bit systems will solve all of your performance bottlenecks.

SERVERS

But users shouldn't be lulled into thinking that 64-bit chip architectures by themselves will solve all of their performance bottlenecks, says Gartner's Weiss. "Sixty-four bits is just one way of improving performance," he says. "I/O will have a major influence on systems architectures over the next three years."

Weiss adds that improved I/O will be especially important for corporate intranet servers–widely expected to be one of the fastest growing niches for servers over the next three to four years. "With intranets, the performance and usage of servers will be unpredictable," he says. "Users will be servicing a distribution channel that could be global."

To cope with this unknown, server vendors need to provide "accordion-like scalability" throughout all aspects of their system architectures, says Weiss.

Indeed, the leading vendors are scaling up their SMP configurations from 16 CPUs to 30 or more. In addition, they're adding clustering capabilities, which allow multiple SMP systems to coordinate loads and provide failsafe rollover capabilities. Again, Digital leads the way in clustering; its UNIX TruCluster software allows up to four 12-way SMP systems to work together, for a total of 48 processors. SMP and clustering are complementary technologies, says Digital's Nist: "SMP increases performance, while clustering improves availability and reliability." IBM, HP, and other high-end competitors have announced plans to introduce clustering but at presstime had not brought products to market.

For the time being, Gartner's Weiss says he believes UNIX vendors are ensconced pretty safely in the higher end of the server market. "We won't see NT scale up into the same space as UNIX servers until 1998 or so," says Weiss. Until that time, NT won't match UNIX in scalability, availability, reliability, and other features vital to IS shops.

But Weiss believes that ceding the low-end server business to NT is a "lost business opportunity" that ultimately will be self-defeating to UNIX vendors because that market segment will generate the greatest volume and profits. That will put a squeeze on server vendors throughout the industry and force consolidation. "Over the next several years, there will only be four or five large server vendors," predicts Weiss.

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Scalability Is Key

What's the most important thing to consider when selecting servers? Sun VP of server business Anil Gadre offers up two answers, one for hardware, the other for software.

On server hardware: "Given the unpredictability of the business environment today, the No. 1 thing IS managers need to concentrate on in picking a server is the scalability of the architecture. In these uncertain times for businesses, scalability is the single most important thing that can reduce risk today. A Web site, for instance, can become hot very quickly, so the degree of scalability available to a system can be very important."

On server applications: "The biggest thing that's about to happen is the emergence of platform-independent applications. They are fundamentally going to change the way people talk about servers. Instead of a general-purpose server, there are going to be more function-specific servers, such database servers, e-mail servers, applets servers....In the old days of the mainframe, users would pile all the applications on a single system. [In the near future] users are going to move that way because it simplifies the way they can manage their networks."

The DATAMATION 100 - The Leading Worldwide IS Companies

1987 Rank	COMPANY	1987 IS REVENUE
1	IBM	$50,485.7
2	Digital Equipment Corp.	10,391.3
3	Unisys Corp.	8,742.0
4	Fujitsu Ltd.	8,740.0
5	NEC Corp.	8,230.5
6	Hitachi Ltd.	6,273.7
7	Siemens AG	5,703.0
8	NCR Corp.	5,075.7
9	Hewlett-Packard Co.	5,000.0
10	Ing. C. Olivetti & Co. SpA	4,637.2
11	Toshiba Corp.	3,441.3
12	Wang Laboratories Inc.	3,045.7
13	Apple Computer Inc.	3,041.2
14	Groupe Bull	3,007.5
15	Control Data Corp.	3,000.9
16	Nixdorf Computer AG	2,821.5
17	Matsushita Electric Indust. Co.	2,628.5
18	NV Philips Gloeilampenfabrieken	2,601.6
19	Xerox Corp.	2,415.0
20	STC plc	2,123.9
21	Honeywell Bull Inc.	2,059.0
22	Alcatel NV	2,052.1
23	AT&T Corp.	2,000.0
24	TRW Inc.	1,960.0
25	Tandy Corp.	1,692.4
26	Mitsubishi Electric Corp.	1,673.9
27	Canon Inc.	1,673.4
28	LM Ericsson	1,511.6
29	Amdahl Corp.	1,505.2
30	Automatic Data Processing Inc.	1,467.0
31	Electronic Data Systems	1,440.5
32	Data General Corp.	1,303.9
33	Nippon Univac Kaisha Ltd.	1,294.6
34	Ricoh Co. Ltd.	1,275.7
35	McDonnell Douglas Corp.	1,241.8
36	Inspectorate International Ltd.	1,225.0
37	Compaq Computer Corp.	1,224.1
38	Seiko Epson Corp.	1,198.4
39	Comdisco Inc.	1,153.0
40	Oki Electric Industry Co. Ltd.	1,137.3
41	Computer Sciences Corp.	1,133.8
42	Nippon Telegraph & Telephone Corp.	1,128.5
43	Tandem Computers Inc.	1,089.6
44	Seagate Technology	1,075.7
45	Memorex International	1,041.1
46	Zenith Electronics Corp.	1,040.0
47	National Semiconductor Corp.	985.0
48	Société Générale	970.1
49	Prime Computer Inc.	960.9
50	Atlantic Computers plc	959.7
51	Northern Telecom Ltd.	900.0
52	C. Itoh & Co. Ltd.	829.2
53	General Electric Co.	800.0
54	Telex Corp.	788.9
55	Commodore International Ltd.	785.0
56	Sun Microsystems Inc.	755.9
57	Storage Technology Corp.	750.0
58	Arthur Andersen & Co.	748.9
59	Texas Instruments Inc.	740.0
60	Motorola Inc.	724.9
61	Cray Research Inc.	687.3
62	Mannesmann AG	686.0
63	Martin Marietta Corp.	685.7
64	Cap Gemini Sogeti	682.3
65	Econocom International BV	674.3
66	Computer Associates International Inc.	648.8
67	Intergraph Corp.	641.1
68	Bell Atlantic Corp.	634.9
69	Alps Electric Co. Ltd.	632.5
70	Samsung Electronics Co. Ltd.	569.5
71	Computervision Corp.	564.0
72	Apollo Computer Inc.	553.6
73	Lockheed Corp.	553.0
74	Racal Electronics plc	549.1
75	Amstrad plc	533.0
76	Comparex Information Systeme GmbH	530.8
77	CSK Group	486.9
78	Microsoft Corp.	456.7
79	Xidex Corp.	455.7
80	3M	455.0
81	Harris Corp.	446.0
82	Finsiel SpA	424.1
83	Norsk Data AS	422.6
84	Continental Information Systems Corp.	405.4
85	Emhart Corp.	404.8
86	Ferranti plc	398.8
87	Wyse Technology	396.2
88	Lotus Development Corp.	395.6
89	Shared Medical Systems Corp.	390.7
90	Convergent Technologies Inc.	384.8
91	Nokia Corp.	375.3
92	Tandon Corp.	374.0
93	Sony Corp.	365.5
94	MiniScribe Corp.	362.5
95	Diebold Inc.	345.5
96	MAI Basic Four Inc.	334.2
96	Dataproducts Corp.	334.2
98	Datapoint Corp.	320.7
99	Tektronix Inc.	320.0
100	Gould Inc.	299.3

Revenue figures are in millions of dollars.

The 100 Leading U.S. IS Companies

1987 US RANK	1987 WORLD RANK	1986 WORLD RANK	COMPANY	1987 IS REVENUE	1986 IS REVENUE	IS REV % CHANGE	1987 TOTAL REVENUE
1	1	1	IBM	50,485.7	47,685.0	5.9	54,217.0
2	2	3	Digital Equipment Corp.	10,391.3	8,414.3	23.5	10,391.3
3	3	2	Unisys Corp.	8,742.0	8,186.0	6.8	9,712.9
4	8	9	NCR Corp.	5,075.7	4,386.6	15.7	5,640.7
5	9	7	Hewlett-Packard Co.	5,000.0	4,500.0	11.1	8,090.0
6	12	12	Wang Laboratories Inc.	3,045.7	2,668.9	14.1	3,045.7
7	13	18	Apple Computer Inc.	3,041.2	2,031.0	49.7	3,041.2
8	15	11	Control Data Corp.	3,000.9	3,004.7	-0.1	3,366.5
9	19	15	Xerox Corp.	2,415.0	2,100.0	15.0	14,895.0
10	21	—	Honeywell Bull Inc.	2,059.0	1,890.0	8.9	2,059.0
11	23	16	AT&T Corp.	2,000.0	2,085.0	-4.1	33,598.0
12	24	23	TRW Inc.	1,960.0	1,625.0	20.6	6,821.2
13	25	24	Tandy Corp.	1,692.4	1,560.2	8.5	3,654.7
14	29	36	Amdahl Corp.	1,505.2	966.3	55.8	1,505.2
15	30	27	Automatic Data Processing Inc.	1,467.0	1,298.1	13.0	1,467.0
16	31	31	Electronic Data Systems	1,440.5	1,125.9	27.9	4,435.9
17	32	28	Data General Corp.	1,303.9	1,287.6	1.3	1,303.9
18	35	29	McDonnell Douglas Corp.	1,241.8	1,189.8	4.4	13,344.5
19	37	54	Compaq Computer Corp.	1,224.1	625.2	95.8	1,224.1
20	39	40	Comdisco Inc.	1,153.0	985.0	17.1	1,234.0
21	41	35	Computer Sciences Corp.	1,133.8	977.7	16.0	1,133.8
22	43	44	Tandem Computers Inc.	1,089.6	845.3	28.9	1,089.6
23	44	50	Seagate Technology	1,075.7	709.4	51.6	1,075.7
24	46	58	Zenith Electronics Corp.	1,040.0	548.0	89.9	2,363.0
25	47	49	National Semiconductor Corp.	985.0	725.0	35.9	2,067.6
26	49	43	Prime Computer Inc.	960.9	860.2	11.7	960.9
27	53	38	General Electric Co.	800.0	800.0	0.0	40,515.0
28	54	48	Telex Corp.	788.9	728.2	8.3	877.8
29	55	46	Commodore International Ltd.	785.0	800.0	-1.9	815.5
30	56	76	Sun Microsystems Inc.	755.9	342.7	120.6	755.9
31	57	51	Storage Technology Corp.	750.0	696.0	7.8	750.0
32	58	59	Arthur Andersen & Co.	748.9	546.0	37.2	2,481.9
33	59	47	Texas Instruments Inc.	740.0	750.0	-1.3	5,594.5
34	60	52	Motorola Inc.	724.9	694.0	4.4	6,707.0
35	61	56	Cray Research Inc.	687.3	596.7	15.2	687.3
36	63	53	Martin Marietta Corp.	685.7	659.4	4.0	5,418.3
37	66	93	Computer Associates International Inc.	648.8	264.9	144.9	648.8
38	67	55	Intergraph Corp.	641.1	605.7	5.8	641.1
39	68	81	Bell Atlantic Corp.	634.9	310.0	104.8	10,298.4
40	71	61	Computervision Corp.	564.0	494.7	14.0	564.0
41	72	69	Apollo Computer Inc.	553.6	391.7	41.3	553.6
42	73	57	Lockheed Corp.	553.0	497.0	11.3	11,321.0
43	78	96	Microsoft Corp.	456.7	260.2	75.5	456.7
44	79	67	Xidex Corp.	455.7	418.3	8.9	599.6
45	80	97	3M	455.0	400.0	13.7	9,429.0
46	81	64	Harris Corp.	446.0	464.0	-3.9	2,083.9
47	84	90	Continental Information Systems Corp.	405.4	282.9	43.3	420.8
48	85	99	Emhart Corp.	404.8	356.0	13.7	2,454.5
49	87	108	Wyse Technology	396.2	228.0	73.8	396.2
50	88	89	Lotus Development Corp.	395.6	283.0	39.9	395.6

All currency figures are in millions. NA = not available.

TAL NUE	IS AS % OF TOTAL	1987 EMPLS	% CHANGE FROM 1986	IS REV PER EMPL* ($ THOU)	R&D CORP 1987	R&D AS % OF TOTAL REV	NET INCOME	% RETURN ON ASSETS	FISCAL YEAR END	LOCATION
,217.0	93.1	389,384	(3.5)	139.2†	5,434.0	10.0	5,258.0	8.3	Dec.	N.Y.
,391.3	100.0	116,800	15.6	89.0	1,138.8	11.0	1,284.3	13.6	June	Mass.
,712.9	90.0	92,500	(5.9)	105.0†	1,318.5	13.6	578.0	5.8	Dec.	Mich.
,640.7	90.0	62,000	0.0	91.0†	355.9	6.3	419.3	10.0	Dec.	Ohio
,090.0	61.8	82,000	0.0	98.7†	901.0	11.1	644.0	7.9	Oct.	Calif.
,045.7	100.0	30,855	(.5)	98.7	232.0	7.6	94.5	3.4	June	Mass.
,041.2	100.0	7,927	33.5	383.7	203.3	6.7	280.5	17.3	Sept.	Calif.
,366.5	89.1	34,500	(2.8)	97.6†	389.0	11.6	19.3	.7	Dec.	Minn.
,895.0	16.2	99,032	(1.3)	150.4†	722.0	4.9	578.0	5.0	Dec.	Conn.
,059.0	100.0	20,500	(6.8)	100.4	216.0	10.5	17.4	NA	Dec.	Minn.
,598.0	6.0	303,000	(2.6)	110.9†	2,453.0	7.3	2,044.0	5.3	Dec.	N.Y.
,821.2	28.7	77,931	(.9)	87.5†	1,874.0	27.5	243.4	5.6	Dec.	Ohio
,654.7	46.3	36,000	0.0	101.5†	NA	NA	289.8	13.0	June	Texas
,505.2	100.0	7,600	5.6	198.1	178.9	11.9	146.0	9.7	Dec.	Calif.
,467.0	100.0	22,000	10.0	66.7	59.6	4.1	149.8	9.4	June	N.J.
,435.9	100.0	43,433	(4.3)	102.1†	NA	NA	323.1	10.9	Dec.	Texas
,303.9	100.0	15,640	(.4)	83.4	164.7	12.6	-111.3	—	Sept.	Mass.
,344.5	9.3	112,400	6.3	118.7†	647.7	4.9	313.0	3.7	Dec.	Mo.
,224.1	100.0	4,000	110.5	306.0	47.1	3.9	136.0	15.1	Dec.	Texas
,234.0	93.4	1,130	21.5	1,092.4	NA	NA	23.0	.8	Sept.	Ill.
,133.8	100.0	18,400	6.4	61.6	NA	NA	40.5	6.5	March	Calif.
,089.6	100.0	7,176	19.2	151.8	120.8	11.1	101.9	9.6	Sept.	Calif.
,075.7	100.0	23,490	97.9	45.8	40.9	3.8	115.3	11.7	June	Calif.
,363.0	44.0	35,000	(5.4)	67.5†	103.4	4.4	-19.1	—	Dec.	Ill.
,067.6	47.6	38,000	23.4	54.4†	220.0	10.6	6.6	.4	May	Calif.
960.9	100.0	8,818	2.3	109.0	109.7	11.4	64.8	4.9	Dec.	Mass.
,515.0	2.0	302,000	15.9	134.2†	1,194.0	3.0	2,915.0	4.7	Dec.	Conn.
877.8	89.9	8,289	5.6	105.9†	50.8	5.8	56.6	8.6	March	Okla.
815.5	96.3	3,150	(.8)	249.2	16.5	2.0	37.1	6.4	June	Pa.
755.9	100.0	5,465	72.8	138.3	101.5	13.4	48.0	7.5	June	Calif.
750.0	100.0	8,865	(5.5)	84.6	60.0	8.0	26.0	3.3	Dec.	Colo.
,481.9	30.2	40,000	10.7	62.0†	NA	NA	NA	NA	Aug.	Ill.
,594.5	13.2	77,984	.9	71.7†	428.0	7.7	308.5	7.3	Dec.	Texas
,707.0	10.8	97,700	3.5	68.6†	524.0	7.8	308.0	5.8	Dec.	Ill.
687.3	100.0	4,308	7.7	159.5	108.8	15.8	147.1	16.3	Dec.	Minn.
,418.3	12.7	68,000	3.3	79.6†	220.0	4.1	230.6	8.2	Dec.	Md.
648.8	100.0	4,000	66.7	162.2	81.1	12.5	60.2	7.7	March	N.Y.
641.1	100.0	6,300	11.5	101.8	67.5	10.5	69.9	9.9	Dec.	Ala.
,298.4	6.2	80,950	.9	127.2†	NA	NA	1,240.4	5.8	Dec.	Pa.
564.0	100.0	4,575	(4.1)	123.3	60.1	10.7	19.5	4.0	Dec.	Mass.
553.6	100.0	3,992	10.9	138.7	61.1	11.0	21.7	4.9	Dec.	Mass.
,321.0	4.9	99,300	2.5	114.0†	549.0	4.8	421.0	7.0	Dec.	Calif.
456.7	100.0	1,996	33.1	228.8	50.1	11.0	93.0	32.3	June	Wash.
599.6	76.0	7,299	12.3	82.1†	10.7	1.8	-48.9	—	June	Calif.
,429.0	4.8	82,405	.5	114.4†	618.0	6.5	918.0	11.4	Dec.	Minn.
,083.9	21.4	23,200	(13.1)	89.8	117.7	5.6	92.2	5.4	June	Fla.
420.8	96.3	900	137.5	450.4	NA	NA	15.1	.8	Feb.	N.Y.
,454.5	16.5	30,548	(10.6)	80.3†	39.8	1.6	106.5	5.2	Dec.	Conn.
396.2	100.0	3,600	137.5	110.1	21.1	5.3	25.5	6.8	March	Calif.
395.6	100.0	2,119	51.4	186.7	58.4	14.8	72.0	22.7	Dec.	Mass.

*For companies with more than 95% of revenues from IS.

†Based on total corporate revenues.

The 100 Leading U.S. IS Companies

1987 US RANK	1987 WORLD RANK	1986 WORLD RANK	COMPANY	1987 IS REVENUE	1986 IS REVENUE	IS REV % CHANGE	1987 TOTAL REVENUE
51	89	71	Shared Medical Systems Corp.	390.7	374.9	4.2	390.7
52	90	83	Convergent Technologies Inc.	384.8	305.8	25.8	384.8
53	92	106	Tandon Corp.	374.0	242.8	54.0	374.0
54	94	125	MiniScribe Corp.	362.5	184.9	96.0	362.5
55	95	78	Diebold Inc.	345.5	325.5	6.1	439.1
56	96	87	MAI Basic Four Inc.	334.2	287.9	16.1	334.2
56	97	73	Dataproducts Corp.	334.2	350.8	-4.7	334.2
58	98	79	Datapoint Corp.	320.7	325.0	-1.3	320.7
59	99	74	Tektronix Inc.	320.0	350.0	-8.6	1,388.9
60	100	86	Gould Inc.	299.3	290.0	3.2	933.4
61	102	98	Eastman Kodak Co.	290.0	250.0	16.0	13,305.0
62	103	133	AST Research Inc.	289.8	168.9	71.6	289.8
63	104	110	Micropolis Corp.	288.3	213.1	35.3	288.3
64	106	158	Genicom Corp.	284.9	133.8	112.9	302.5
65	108	112	Ashton-Tate	267.3	210.7	26.9	267.3
66	109	84	Boeing Co.	266.3	300.0	-11.2	15,355.0
67	110	109	Concurrent Computer Corp.	265.3	227.7	16.5	265.3
68	111	100	Recognition Equipment Inc.	265.2	246.6	7.5	265.2
69	112	120	Management Science America Inc.	258.5	193.5	33.6	258.5
70	114	111	Gerber Scientific Inc.	254.8	213.1	19.6	254.8
71	116	116	Atari	250.0	200.0	25.0	493.2
72	119	107	Schlumberger Ltd.	240.0	240.0	0.0	4,727.0
73	120	147	Maxtor Corp.	239.4	148.0	61.8	239.4
74	121	114	Reynolds & Reynolds Co.	237.9	204.3	16.4	572.1
75	123	95	Paradyne Corp.	232.6	261.1	-10.9	232.6
76	125	129	Bolt Beranek and Newman Inc.	223.1	172.5	29.3	279.8
77	126	128	Mentor Graphics Corp.	221.8	173.5	27.8	221.8
78	127	117	Intel Corp.	220.0	200.0	10.0	1,907.1
79	130	121	Micom Systems Inc.	212.5	192.5	10.4	212.5
80	131	131	AGS Computers Inc.	212.3	171.0	24.1	496.7
81	132	178	Everex Systems Inc.	210.1	106.4	97.5	210.1
82	133	134	Cullinet Software Inc.	203.9	166.9	22.2	203.9
83	134	126	Software AG Systems Inc.	203.0	180.0	12.8	203.0
84	135	194	Novell Inc.	202.1	113.6	77.9	202.1
85	136	137	Digital Communications	200.6	162.2	23.7	200.6
86	137	115	Dun & Bradstreet Corp.	200.0	200.0	0.0	3,359.2
86	138	156	Price Waterhouse	200.0	135.0	48.1	1,804.0
88	139	185	Oracle Corp.	198.0	88.0	125.0	198.0
89	140	141	The Ultimate Corp.	197.7	157.6	25.4	197.7
89	141	122	General DataComm Industries Inc.	197.7	189.2	4.5	197.7
91	142	192	3Com Corp.	197.5	121.1	63.1	197.5
92	144	113	Sterling Software Inc.	196.9	209.6	-6.1	196.9
93	147	119	Decision Data Computer Corp.	191.4	195.1	-1.9	191.4
94	148	166	Stratus Computer Inc.	184.1	124.6	47.7	184.1
95	149	135	ISC Systems Corp.	181.4	162.4	11.7	181.4
96	150	145	Policy Management Systems Corp.	180.0	151.0	19.2	180.0
97	151	169	Quantum Corp.	178.3	116.5	53.0	178.3
98	152	142	HBO & Co.	175.2	155.0	13.0	175.2
99	153	193	Touche Ross	175.0	NA	NA	1,450.0
100	154	155	American Management Systems Inc.	174.3	135.5	28.6	174.3

All currency figures are in millions. NA = not available.

IS AS % OF TOTAL	1987 EMPLS	% CHANGE FROM 1986	IS REV PER EMPL* ($ THOU)	R&D CORP 1987	R&D AS % OF TOTAL REV	NET INCOME	% RETURN ON ASSETS	FISCAL YEAR END	LOCATION
100.0	4,300	16.2	90.9	37.9	9.7	45.3	14.7	Dec.	Pa.
100.0	3,200	28.9	120.3	33.6	8.7	-32.6	—	Dec.	Calif.
100.0	2,800	21.7	133.6	17.5	4.7	10.3	5.6	Dec.	Calif.
100.0	4,971	87.0	72.9	19.8	5.5	31.1	11.4	Dec.	Colo.
78.7	4,878	(8.3)	90.0†	21.9	5.0	35.8	8.1	Dec.	Ohio
100.0	3,367	11.8	99.3	22.9	6.8	23.9	10.1	Sept.	Calif.
100.0	3,600	(14.3)	92.8	25.6	7.7	-3.6	—	March	Calif.
100.0	2,810	(22.4)	114.1	10.5	3.3	15.3	3.8	July	Texas
23.0	16,879	(2.7)	82.3†	207.5	14.9	25.7	2.6	May	Ore.
32.1	10,126	(4.6)	92.2†	94.3	10.1	-95.6	—	Dec.	Ill.
2.2	124,400	2.4	107.0†	992.0	7.5	1,178.0	8.1	Dec.	N.Y.
100.0	1,525	90.6	190.0	13.5	4.7	8.3	4.8	June	Calif.
100.0	2,385	46.9	120.9	21.8	7.7	27.3	10.4	Dec.	Calif.
94.2	3,600	44.0	84.0†	14.9	4.9	12.6	5.5	Dec.	Va.
100.0	1,200	20.0	222.8	28.0	10.5	43.1	17.4	Jan.	Calif.
1.7	136,100	18.3	112.8†	824.0	5.4	480.0	3.8	Dec.	Wash.
100.0	2,789	(3.0)	95.1	28.8	10.9	12.9	4.9	July	N.J.
100.0	2,859	(1.6)	92.8	11.2	4.2	11.8	4.4	Oct.	Texas
100.0	2,700	2.2	95.7	51.4	19.9	-71.0	—	Dec.	Ga.
100.0	1,850	8.8	137.7	17.7	7.0	28.0	11.8	April	Conn.
50.7	3,850	208.0	128.1†	18.0	3.7	57.4	11.0	Dec.	Calif.
5.1	50,000	0.0	94.5	351.8	7.4	282.6	4.2	Dec.	N.Y.
100.0	2,500	64.0	95.8	20.1	8.4	16.1	5.9	March	Calif.
41.6	5,704	5.1	100.3†	NA	NA	28.0	7.0	Sept.	Ohio
100.0	3,115	3.8	74.7	19.0	8.2	-2.6	—	Dec.	Fla.
79.7	2,850	14.9	98.2†	19.0	6.8	-6.1	—	June	Mass.
100.0	1,200	32.0	184.8	24.4	10.9	20.3	8.9	Dec.	Ore.
11.5	19,200	2.7	99.3†	259.8	13.6	248.1	9.6	Dec.	Calif.
100.0	2,159	2.2	98.4	23.9	11.3	6.8	3.2	March	Calif.
42.7	3,439	11.3	144.4†	12.7	2.6	14.2	6.4	Dec.	N.J.
100.0	1,300	188.9	161.6	12.6	6.0	10.2	9.4	July	Calif.
100.0	2,427	35.1	84.0	53.5	26.2	-23.3	—	April	Mass.
100.0	1,800	2.9	112.8	50.0	24.6	20.0	8.7	May	Va.
100.0	1,240	93.7	163.0	11.1	5.5	21.5	15.4	Oct.	Utah
100.0	1,307	23.8	153.5	24.3	12.1	34.3	16.0	June	Ga.
6.0	60,000	3.5	55.9†	NA	NA	393.0	11.8	Dec.	N.Y.
11.1	35,100	7.0	51.4†	NA	NA	NA	NA	June	N.Y.
100.0	1,597	106.1	124.0	23.2	11.7	29.7	16.0	May	Calif.
100.0	710	67.5	278.5	2.0	1.0	16.7	8.7	April	N.J.
100.0	2,623	.7	75.4	25.8	13.0	-8.3	—	Sept.	Conn.
100.0	1,115	119.9	177.1	17.8	9.0	18.0	10.4	May	Calif.
100.0	2,300	(8.0)	85.6	17.3	8.8	5.9	2.7	Sept.	Texas
100.0	1,545	(3.5)	123.9	10.9	5.7	-23.3	—	Nov.	Pa.
100.0	1,224	14.5	150.4	18.9	10.3	19.4	13.3	Dec.	Mass.
100.0	1,800	0.0	100.8	14.6	8.0	8.1	5.6	June	Wash.
100.0	2,577	1.1	69.8	30.7	17.1	17.1	6.1	Dec.	S.C.
100.0	590	(9.8)	302.2	11.4	6.4	8.1	5.2	March	Calif.
100.0	1,772	1.2	98.9	13.0	7.4	13.3	13.1	Dec.	Ga.
12.1	30,000	0.0	48.3†	NA	NA	NA	NA	Aug.	N.Y.
100.0	2,300	37.3	75.8	6.3	3.6	7.6	9.2	Dec.	Va.

*For companies with more than 95% of revenues from IS.

†Based on total corporate revenues.

The 50 Leading Non-U.S. IS Companies

1987 NON-US RANK	1987 WORLD RANK	1986 WORLD RANK	COMPANY	1987 IS REVENUE	1986 IS REVENUE	IS REV % CHANGE	1987 TOTAL REVENUE	IS AS % OF TOTAL
1	4	4	Fujitsu Ltd.	8,740.0	6,575.7	32.9	13,103.2	66.7
2	5	5	NEC Corp.	8,230.5	6,324.6	30.1	18,236.8	45.1
3	6	6	Hitachi Ltd.	6,273.7	4,728.8	32.7	33,070.6	19.0
4	7	8	Siemens AG	5,703.0	4,383.3	30.1	28,615.7	19.9
5	10	10	Ing. C. Olivetti & Co. SpA	4,637.2	3,869.1	19.8	5,686.7	81.5
6	11	13	Toshiba Corp.	3,441.4	2,605.0	32.1	23,829.0	14.4
7	14	14	Groupe Bull	3,007.5	2,569.1	17.1	3,007.5	100.0
8	16	17	Nixdorf Computer AG	2,821.5	2,073.3	36.1	2,821.5	100.0
9	17	19	Matsushita Electric Indust. Co.	2,628.5	1,972.1	33.3	31,906.1	8.2
10	18	21	NV Philips Gloeilampenfabrieken	2,601.6	1,967.6	32.2	26,023.1	10.0
11	20	22	STC plc	2,123.9	1,750.8	21.3	3,379.0	62.9
12	22	—	Alcatel NV	2,052.1	1,697.4	20.9	12,909.8	15.9
13	26	25	Mitsubishi Electric Corp.	1,673.9	1,345.0	24.4	14,947.2	11.2
14	27	—	Canon Inc.	1,673.4	994.1	68.3	6,753.5	24.8
15	28	26	LM Ericsson	1,511.6	1,343.6	12.5	5,110.2	29.6
16	33	34	Nippon Univac Kaisha Ltd.	1,294.6	985.9	31.3	1,294.6	100.0
17	34	37	Ricoh Co. Ltd.	1,275.7	933.8	36.6	4,394.9	29.0
18	36	—	Inspectorate International Ltd.	1,225.0	266.8	359.1	1,665.5	73.6
19	38	32	Seiko Epson Corp.	1,198.4	1,035.7	15.7	2,164.3	55.4
20	40	42	Oki Electric Industry Co. Ltd.	1,137.3	880.6	29.1	3,193.5	35.6
21	42	30	Nippon Telegraph & Telephone Corp.	1,128.5	905.2	24.7	38,112.6	3.0
22	45	—	Memorex International	1,041.1	NA	NA	1,041.1	100.0
23	48	—	Société Générale	970.1	567.9	70.8	4,767.6	20.3
24	50	65	Atlantic Computers plc	959.9	429.7	123.4	1,031.2	93.1
25	51	38	Northern Telecom Ltd.	900.0	900.0	0.0	4,853.5	18.5
26	52	45	C. Itoh & Co. Ltd.	829.2	808.7	2.5	105,382.4	0.8
27	62	62	Mannesmann AG	686.0	488.5	40.4	823.5	83.3
28	64	66	Cap Gemini Sogeti	682.3	420.1	62.4	682.3	100.0
29	65	—	Econocom International BV	674.3	435.2	54.9	674.3	100.0
30	69	—	Alps Electric Co. Ltd.	632.5	NA	NA	2,635.6	24.0
31	70	68	Samsung Electronics Co. Ltd.	569.5	395.1	44.1	4,117.9	13.8
32	74	63	Racal Electronics plc	549.1	472.8	16.1	2,178.1	25.2
33	75	—	Amstrad plc	533.0	274.0	94.5	965.3	55.2
34	76	—	Comparex Information Systeme GmbH	530.8	NA	NA	530.8	100.0
35	77	82	CSK Group	486.9	308.7	57.7	802.1	60.7
36	82	—	Finsiel SpA	424.1	304.1	39.5	424.1	100.0
37	83	75	Norsk Data AS	422.6	349.0	21.1	422.6	100.0
38	86	72	Ferranti plc	398.8	335.7	18.8	1,068.8	37.3
39	91	91	Nokia Corp.	375.3	273.4	37.3	3,181.7	11.8
40	93	88	Sony Corp.	365.5	285.2	28.2	9,470.6	3.9
41	101	—	Acer Group	294.0	147.0	100.0	319.0	92.2
42	105	—	Scicon International Ltd.	287.0	250.7	14.5	287.0	100.0
43	107	—	Kyocera Corp.	281.6	0.0	NA	2,085.1	13.5
44	113	140	Nomura Computer Systems Co. Ltd.	257.5	158.1	62.9	377.1	68.3
45	115	—	Intec	253.8	NA	NA	253.8	100.0
46	117	118	Thorn EMI plc	246.1	199.4	23.4	5,207.7	4.7
47	118	85	Plessey Co. plc	243.6	293.2	-16.9	2,107.6	11.6
48	122	—	Mitac Corp.	235.0	NA	NA	235.0	100.0
49	124	123	GSI	230.5	187.7	22.8	230.5	100.0
50	128	—	GoldStar Co.	212.7	NA	NA	NA	NA

All currency figures are in millions. NA = not available.

NONDOLLAR ACCTG CURRENCY					R&D			
1987 IS	1986 IS	% CHANGE	COUNTRY	1987 EMPLS	CORP 1987	AS % OF TOT REV	NET INCOME	FISCAL YEAR END
¥1,263,992.0	¥1,108,134.0	14.1	Japan	89,293	1,154.7	8.8	171.0	March
¥1,190,314.0	¥1,065,820.0	11.7	Japan	101,227	1,711.4	9.4	208.0	March
¥907,315.0	¥796,899.0	13.9	Japan	161,325	2,179.3	6.6	734.5	March
DM10,250.0	DM9,520.0	7.7	W.Ger.	359,000	3,455.7	12.1	709.4	Sept.
L6,014,300.0	L5,769,000.0	4.3	Italy	58,087	330.6	5.8	310.0	Dec.
¥497,700.0	¥439,000.0	13.4	Japan	124,000	1,514.3	6.4	293.6	March
FF18,071.2	FF17,796.0	1.5	France	26,337	332.9	11.1	37.5	Dec.
DM5,071.0	DM4,503.0	12.6	W.Ger.	29,440	265.4	9.4	146.9	Dec.
¥380,145.0	¥332,340.0	14.4	Japan	132,851	1,832.4	5.7	1,010.7	Nov.
G5,270.0	G4,820.0	9.3	Neth.	336,700	2,154.3	8.3	403.8	Dec.
£1,299.0	£1,194.2	8.8	U.K.	33,860	287.8	8.5	221.1	Dec.
ECU1,780.0	ECU1,730.0	2.9	Belgium	137,000	861.2	6.7	398.9	Dec.
¥242,077.0	¥226,654.0	6.8	Japan	70,935	815.9	5.5	131.4	March
¥242,014.0	¥167,519.0	44.5	Japan	NA	449.4	6.6	91.6	March
Skr9,584.0	Skr9,571.0	0.1	Sweden	70,893	505.3	9.9	115.9	Dec.
¥187,227.0	¥166,138.0	12.7	Japan	4,410	NA	NA	20.1	March
¥184,490.0	¥157,357.0	17.2	Japan	15,000	273.6	6.2	92.3	March
SFr1,835.3	SFr182.0	908.4	Switz.	7,698	NA	NA	57.2	Dec.
¥173,317.0	¥174,530.0	-0.7	Japan	17,000	194.8	9.0	NA	March
¥164,481.0	¥148,404.0	10.8	Japan	18,328	178.0	5.6	31.4	March
¥163,201.0	¥152,544.0	7.0	Japan	298,000	NA	NA	1,332.2	March
G2,108.9	NA	NA	Neth.	14,106	51.0	4.9	47.0	Nov.
FF5,829.0	FF3,934.0	48.2	France	NA	NA	NA	NA	Dec.
£587.1	£293.1	100.3	U.K.	1,134	3.3	0.3	42.3	Dec.
—	—	—	Canada	48,778	587.5	12.1	328.8	Dec.
¥119,924.0	¥136,288.0	-12.0	Japan	10,800	NA	NA	138.8	March
DM1,233.0	DM1,061.0	16.2	W.Ger.	9,457	NA	NA	NA	Dec.
FF4,100.0	FF2,910.0	40.9	France	10,600	34.1	5.0	44.3	Dec.
G1,366.0	G1,066.0	28.1	Neth.	1,600	NA	NA	NA	Dec.
¥91,478.0	NA	NA	Japan	NA	NA	NA	NA	March
W468,435.0	W348,300.0	34.5	S.Korea	44,316	245.9	6.0	74.6	Dec.
£335.8	£322.5	4.1	U.K.	32,000	160.2	7.4	193.9	March
£326.0	£186.9	74.4	U.K.	1,009	NA	NA	172.7	June
DM954.0	NA	NA	W.Ger.	1,056	NA	NA	22.4	Dec.
¥70,423.0	¥52,016.0	35.4	Japan	NA	NA	NA	NA	Sept.
L550,000.0	L453,428.0	21.3	Italy	4,060	23.2	5.5	13.2	Dec.
NKr2,847.0	NKr2,580.0	10.3	Norway	4,488	43.0	10.2	29.4	Dec.
L243.9	L229.0	6.5	Italy	24,000	NA	NA	90.6	March
Fmk1,650.0	Fmk1,386.0	19.0	Finland	29,300	145.1	4.6	278.6	Dec.
¥52,859.0	¥48,054.0	10.0	Japan	51,000	852.4	9.0	251.3	Oct.
TD9,336.3	TD5,562.0	67.9	Taiwan	3,795	10.0	3.1	NA	Dec.
£175.5	£171.0	2.6	U.K.	3,800	8.0	2.8	NA	Dec.
¥40,728.8	NA	NA	Japan	NA	NA	NA	NA	March
¥37,234.0	¥26,643.0	39.8	Japan	1,200	NA	NA	NA	Sept.
¥36,702.0	NA	NA	Japan	NA	NA	NA	NA	March
£150.5	£136.0	10.7	U.K.	65,000	87.6	1.7	162.9	March
£149.0	£200.0	-25.5	U.K.	NA	NA	NA	NA	March
TD7,462.7	NA	NA	Taiwan	NA	NA	NA	NA	Dec.
FF1,385.0	FF1,300.0	6.5	France	2,185	11.8	5.1	NA	Dec.
W175,000.0	NA	NA	S.Korea	NA	NA	NA	NA	Dec.

THE DATAMATION 100

THE TOP 100 U.S. COMPANIES IN THE DP INDUSTRY

1981 RANK	1980 RANK	COMPANY	1981 DP REVENUE ($ millions)	% GROWTH RATE (DP)	1981 TOTAL REVENUE ($ millions)	RETURN ON EQUITY	FISCAL YEAR END
1	1	International Business Machine	$26,340.0	16.7%	$29,070.0	19.1%	Dec.
2	4	Digital Equipment Corp.	3,586.6	30.7	3,586.6	12.7	June
3	3	Control Data Corp.	3,103.3	12.2	4,162.6	10.4	Dec.
4	2	NCR Corp.	3,071.8	4.1	3,432.7	11.7	Dec.
5	6	Burroughs Corp.	2,934.0	24.6	3,405.4	6.8	Dec.
6	5	Sperry Corp.	2,781.0	8.9	5,544.0	14.1	Mar.
7	8	Hewlett-Packard Co.	1,875.0	18.4	3,695.0	16.3	Oct.
8	7	Honeywell, Inc.	1,773.7	8.5	5,351.2	13.2	Dec.
9	9	Xerox Corp.	1,100.0	15.7	8,619.0	18.0	Dec.
10	11	Wang Laboratories Inc.	1,008.5	47.9	1,008.5	16.7	June
11	13	Storage Technology	922.0	52.9	922.0	17.5	Dec.
12	20	TRW, Inc.	855.0	11.1	5,285.1	16.8	Dec.
13	12	Data General Corp.	764.4	13.6	764.4	13.4	Sept.
14	17	General Electric Co.	750.0	57.8	27,854.0	18.1	Dec.
15	14	Texas Instruments Inc.	666.7	6.7	4,206.0	6.2	Dec.
16	15	Computer Sciences Corp.	624.7	11.4	624.7	27.9	Mar.
17	16	Automatic Data Processing	613.0	20.9	613.0	17.4	June
18	30	ITT Corp.	540.0	33.3	23,200.0	18.1	Dec.
19	18	Electronic Data Systems	480.6	17.6	486.7	24.7	June
20	21	Datapoint Corp.	474.1	30.2	474.1	12.0	July
21	35	Tandy Corp.	460.0	109.0	1,885.5	39.7	June
22	19	Amdahl Corp.	442.7	12.2	442.7	10.6	Dec.
23	47	Apple Computer Inc.	401.1	142.7	401.1	22.2	Sept.
24	25	McDonnell Douglas Corp.	376.7	23.7	7,384.9	10.0	Dec.
25	27	Prime Computer, Inc.	365.0	36.1	365.0	31.8	Dec.
26	23	Management Assistance Inc.	349.1	12.4	349.1	17.1	Sept.
27	0	Comdisco, Inc.	343.9	25.0	343.9	26.6	Sept.
28	91	Rolm Corp.	331.5	32.1	331.5	27.6	July
29	32	National Semiconductor	330.0	10.0	1,094.8	18.0	May
30	26	Mohawk Data Sciences Corp.	320.9	11.6	320.8	12.2	April
31	28	Harris Corp.	313.0	20.3	1,636.2	20.7	June
32	24	Tektronix, Inc.	308.9	7.8	1,100.0	15.3	May
33	38	Tymshare Inc.	289.7	23.2	289.7	9.7	Dec.
34	41	Computervision Corp.	270.7	41.7	270.7	25.0	Dec.
35	31	Dataproducts Corp.	270.0	8.7	270.0	11.4	Mar.
36	70	Gould, Inc.	270.0	44.3	1,846.0	11.9	Dec.
37	34	Raytheon Co.	245.0	8.8	5,636.0	20.1	Dec.
38	53	Tandem Computers, Inc.	242.5	88.4	242.5	12.9	Sept.
39	37	Racal Corp.	240.0	13.2	240.0	NM	Mar.
40	40	Four-Phase Systems	233.7	18.5	233.7	NM	Dec.
41	33	Perkin-Elmer	230.0	1.7	1,096.0	18.7	July
42	36	Northern Telecom	229.3	5.7	2,151.9	NM	Dec.
43	63	Lanier Business Products	228.0	18.4	325.7	30.1	May
44	39	3M	225.0	9.7	6,500.0	12.4	Dec.
45	42	C. Itoh Electronics, Inc.	213.0	12.6	213.0	NM	Dec.
46	57	Boeing	195.5	46.4	9,788.2	26.0	Dec.
47	44	Motorola Inc.	180.0	42.8	3,335.9	17.2	Dec.
48	46	Signal Co.	176.0	6.6	5,342.6	12.2	Dec.
49	49	Sanders Associates Inc.	171.5	45.0	364.4	17.2	July
50	48	Allied Corp.	162.0	10.2	6,407.0	13.9	Dec.

1981 RANK
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	FISCAL YEAR END
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7.2	Dec.
2.2	Dec.
7.2	July
3.9	Dec.

1981 RANK	1980 RANK	COMPANY	1981 DP REVENUE ($ millions)	% GROWTH RATE (DP)	1981 TOTAL REVENUE ($ millions)	RETURN ON EQUITY	FISCAL YEAR END
51	66	Commodore International, Ltd.	161.6	33.2	199.5	50.9	June
52	29	Teletype Corp.	161.4	-0.9	221.0	NM	Dec.
53	45	General Instrument Corp.	160.0	-6.9	905.0	19.7	June
54	51	Nixdorf Computer Corp.	159.3	15.1	159.3	NM	Dec.
55	0	M/A - COM Inc.	151.0	56.8	541.6	19.7	Sept.
56	56	Informatics, Inc.	150.3	19.3	150.3	23.7	Dec.
57	60	Wyly Corp.	147.0	24.5	147.0	14.9	Dec.
58	68	Telex Corp.	142.7	21.0	200.4	16.2	Mar.
59	67	Dun & Bradstreet	142.3	17.8	1,331.0	29.9	Dec.
60	98	Philips Information Systems	140.0	105.8	140.0	NM	Dec.
61	61	United Telecom	137.0	7.8	2,263.0	40.4	Dec.
62	77	Paradyne Corp.	135.4	78.3	135.4	12.8	Dec.
63	64	Shared Medical Systems	131.6	23.4	131.6	NM	Dec.
64	50	Bradford National	130.0	18.0	130.0	NM	Dec.
65	62	Recognition Equipment, Inc.	125.3	1.6	125.3	NM	Oct.
66	76	CPT Corp.	123.8	60.5	123.8	23.3	June
67	52	Centronics Data Computer Corp.	118.9	-9.9	118.9	NM	June
68	0	Data Terminal Systems	118.3	10.4	118.3	NM	Jan.
69	55	General Automation Inc.	115.6	-8.8	115.6	5.2	July
70	59	Reynolds & Reynolds	115.2	-5.1	212.0	14.1	Sept.
71	74	Martin Marietta Corp.	112.0	43.5	112.0	17.0	Dec.
72	54	Planning Research	106.6	-8.1	319.6	NM	June
73	85	Dysan Corp.	104.2	65.9	104.2	6.7	Oct.
74	75	Gerber Scientific, Inc.	101.9	30.6	115.6	31.4	April
75	86	Cray Research, Inc.	101.7	67.2	101.7	14.4	Dec.
76	0	Mannesmann-Tally	100.0	17.6	100.0	NM	Dec.
77	0	NEC Information Systems, Inc.	100.0	25.0	100.0	NM	Mar.
78	94	National Data Corp.	96.9	19.6	96.9	20.5	May
79	83	Commerce Clearing House, Inc.	91.9	36.5	312.6	53.2	Dec.
80	90	Intergraph Corp.	91.1	61.2	91.1	43.4	Dec.
81	0	Diebold Inc.	90.0	20.0	365.9	18.1	Dec.
82	84	Quotron Systems, Inc.	88.1	37.8	88.1	23.8	Dec.
83	73	Modular Computer Systems Inc.	87.2	7.5	87.2	5.2	Dec.
84	68	Comshare Inc.	82.2	-5.5	82.2	10.5	June
85	96	Management Science America Inc.	73.1	36.1	73.1	29.2	Dec.
86	72	Computer Automation Inc.	71.8	-11.6	71.8	5.8	June
87	100	Verbatim Corp.	68.6	41.7	68.6	6.3	July
88	0	Cado Systems Corp.	68.2	34.7	68.2	18.9	Dec.
89	82	Applicon	64.0	17.6	64.0	29.8	April
90	0	Datacrown, Inc.	63.1	26.0	86.2	NM	Dec.
91	0	American Management Systems	62.1	10.4	62.1	NM	Dec.
92	69	Sun Co.	61.0	22.0	61.0	18.1	Dec.
93	99	Printronix Inc.	60.1	23.1	60.1	18.3	Mar.
94	79	Lear Siegler, Inc.	60.0	9.0	1,532.0	20.5	June
95	0	Cromemco Inc.	59.0	31.1	59.0	NM	Dec.
96	93	Nashua Corp.	58.0	8.4	853.9	6.3	Dec.
97	0	Floating Point Systems	57.8	36.3	57.8	11.9	Oct.
98	92	MSI Data Corp.	56.9	6.9	56.9	19.4	Mar.
99	87	Triad Systems Corp.	56.6	56.3	56.6	40.9	Sept.
100	88	General DataComm Industries	55.6	5.5	55.6	5.9	Sept.

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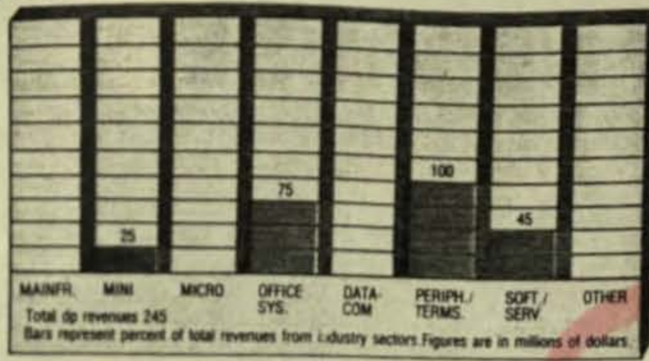

Total dp revenues 245
Bars represent percent of total revenues from industry sectors Figures are in millions of dollars

RAYTHEON CO.
RAYTHEON DATA SYSTEMS
141 Spring Street
Lexington, MA 02173
(617) 862-6600

Raytheon Data Systems, the data processing division of Raytheon Co., saw little growth in 1981. Revenues for the group stood at $245 million, which was an 8.8% increase for the year.

Raytheon Data Systems' biggest revenue producer is its line of IBM-compatible terminals. Products such as the PTS 100, 3270 intelligent terminals, PTS 1200, high end 3270 intelligent terminals, and PTS 2000 accounted for $100 million in sales last year.

The company also sells distributed data processing systems under the PTS/1200 name. Such products accounted for $25 million in revenues last year. Service and maintenance for Raytheon products accounted for another $45 million.

One of the major focuses of the company's efforts is its word processing business, which brought in $75 million in revenues in 1981. The company aims to enter the office of the future market by combining the word processing expertise that it bought when it acquired Lexitron in 1977 with the experience that it has acquired internally in data processing.

Towards that end, RDS last year undertook a major reorganization in which it folded Lexitron into its operations as a consolidated division instead of as a subsidiary. At the same time, the company combined its regional sales and service staffs for terminals and word processing into one force dedicated to all of the company's products.

In the office equipment area, RDS last year introduced a standalone workstation, the Informa 2202/2203 Information Station. It is working on a new product line, which will combine word processing and distributed data processing for a variety of industries, that it expects to introduce some time in 1983.

On the data processing side, RDS added enhancements to its PTS 2000 intelligent terminal systems, and added a member to its distributed processing system, the PTS 1210.

Raytheon Co., which reported a rise in profits of 14.8% to $324 million on revenues of $5.6 billion for fiscal 1981, includes a number of operations outside of RDS that are involved in data processing. Raytheon Service Co. provides computer equipment maintenance, Raytheon Semiconductor makes chips, Raytheon Equipment makes some displays for military use, and Raytheon Seismograph makes turnkey seismic analysis systems.

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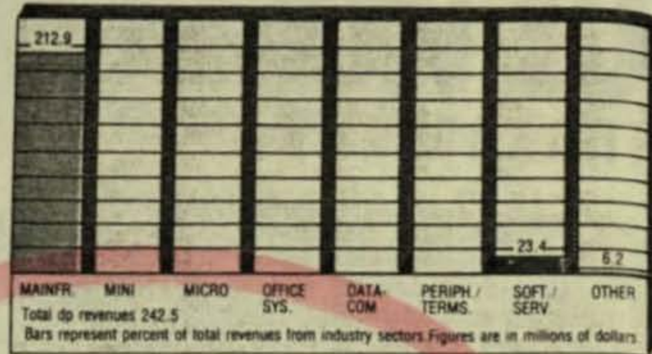


Total dp revenues 242.5
Bars represent percent of total revenues from industry sectors Figures are in millions of dollars

TANDEM COMPUTERS INC.
1933 Vallco Parkway
Cupertino, CA 95017
(408) 725-6000

Tandem Computers Inc., the originator of nonstop multiple processor computers for on-line data transactions, experienced another year of remarkable growth. Revenues for calendar year 1981 increased 88.4% to $242.5 million while net income was up 134% to $30.8 million. Tandem increased its customer base by more than 60% and now has 2,500 processors installed at some 500 locations.

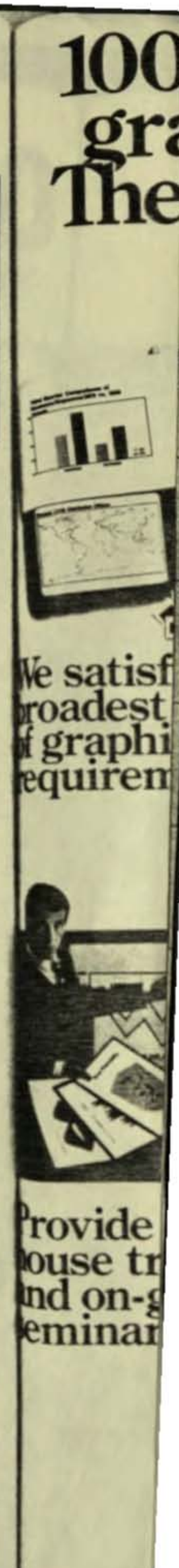
The company introduced its second system, the NonStop II, designed to provide improved price/performance for users with larger on-line transaction needs. Both the NonStop and the NonStop II utilize multiple processors, multiple controllers, and multiple datapaths. If one part of the computer fails, the operating software automatically reallocates the workload. NonStop systems can remain running even during servicing.

Tandem offers several software packages to facilitate the development of on-line applications. These include EXPAND network software, ENCOMPASS database management software, ACCESS communications software, and EXCHANGE remote batch station software. About two thirds of Tandem's sales are to end users, who develop their own applications software, while the rest are to software and systems development houses.

Virtually alone in its market since delivering the first NonStop system in 1977, Tandem now faces direct competition. Stratus Computer Inc. of Natick, Mass., introduced its "fault tolerant" system last fall, with first deliveries scheduled for this year; Dosc Inc. of Albertson, N.Y., unveiled its Failsafe system in December; and Sequoia Systems, also of Natick, indicated it plans to enter the market in 1983.

Having surpassed the critical $100 million mark in sales, Tandem also must successfully cope with its own growing pains. During 1981 Tandem more than doubled the number of its employees (to over 3,000), opening new marketing and support offices both here and abroad, as well as expanding its manufacturing operations to three additional sites in California, Virginia, and Texas. In fiscal 1981, Tandem increased its investment in research and development by 103% to $17.8 million. The funds were devoted to efforts toward improving programmer productivity, equipment serviceability, database software, networking, and communications technology.

About one third of Tandem's revenues are from foreign sales. Important developments there include a multimillion-dollar contract from Sweden's major airline (Tandem would like to penetrate the airline market in the U.S. as well). Currently, Tandem's strongest market is manufacturing. This year, however, it introduced an ergonomically designed display terminal that it hopes will make its NonStop computers more attractive to financial and government agencies, especially in Europe.



TANDEM HISTORICAL INFORMATION
BUSINESS WEEK MAGAZINE – JUL., 14, 1980

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BusinessWeek

July 14, 1980 • $1.50

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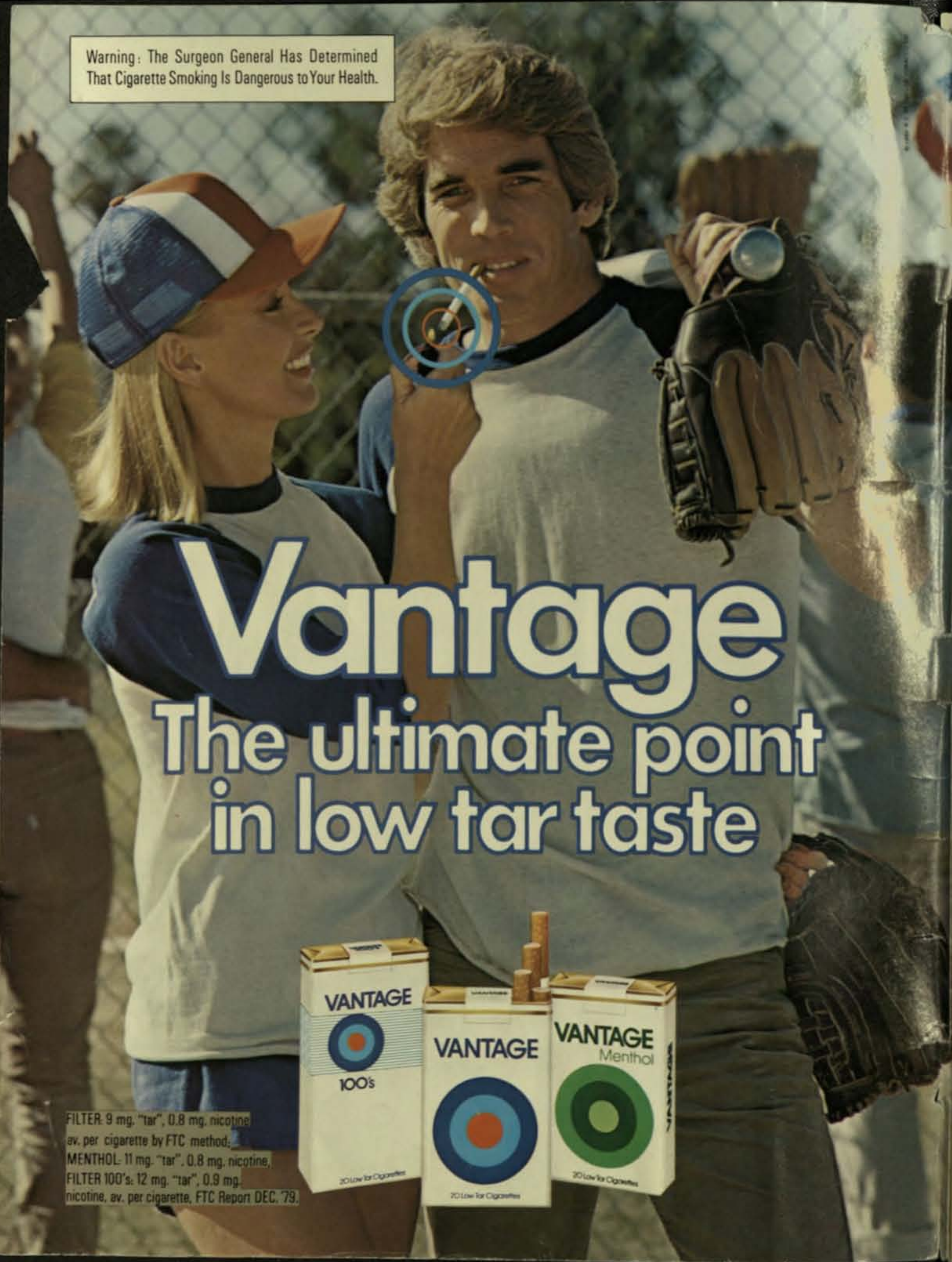

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July 14, 1980

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Back to railroading for a new era

Once again, Union Pacific is shaking up the railroad industry. After successfully diversifying into energy a decade ago, the company has shifted emphasis back to its rail lines. It is embarking on a plan that would make it, in the words of one analyst, "the strongest system in the West." UP's move, combined with deregulation, is prompting a spate of shotgun-like marriages among other railroads and as a result the industry will never be the same

Cover: Illustration by Deborah E. Bazzel

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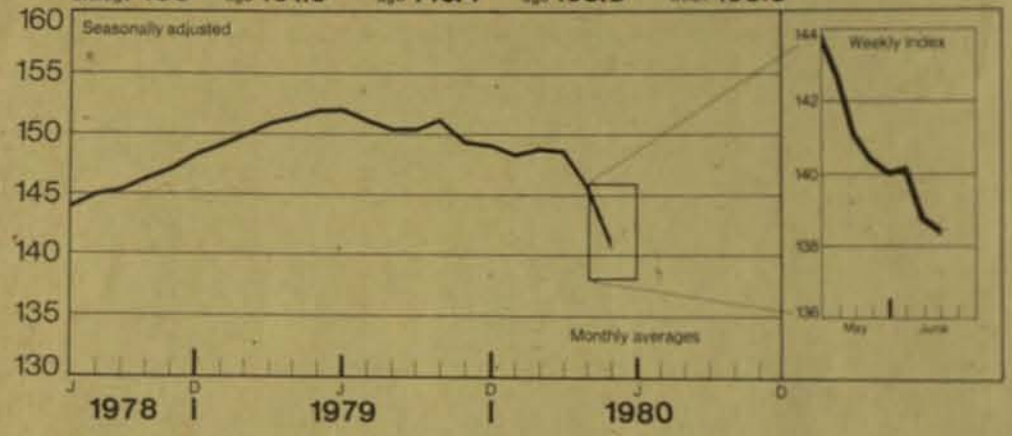
Business Week index

1967 average 100 | Year ago 151.8 | Month ago 140.4 | Week ago 138.8 | Latest week 138.5*



The index declined slightly in the week ended June 21. Steel output continued a seven-week decline, falling 1%. Auto production fell moderately, but truck output gained 43%, as a number of plants resumed operation after the previous week's downtime. Lumber and coal production both posted sizable losses. Rail freight traffic declined 2% after seasonal adjustment. Paperboard output rebounded 4%, while paper production lost 4%. Electric power output posted a moderate gain, and crude-oil refining rose slightly.

Figures of the week

Production indicators		Latest week	Previous week	Month ago	Year ago	1967 average
Raw steel/Amer. Iron & Steel Inst., thous. of net tons	June 28	**1,692**	1,767#	1,863	2,804	2,440
Automobiles/*Ward's Automotive Reports*	June 28	**124,496**	123,967r#	126,899	188,333	142,438
Trucks/*Ward's Automotive Reports*	June 28	**26,437**	30,339r#	25,045	71,847	30,490
Electric power/Edison Elec. Inst., millions of kilowatt-hours	June 28	**46,894**	43,621#	40,863	44,256	23,169
Crude-oil refinery runs/Amer. Pet. Inst., daily av., thous. of bbl.	June 28	**13,723**	13,787#	13,787	15,222	9,815
Bituminous coal/Energy Dept., thous. of net tons	June 21	**17,650#**	18,000	17,070	15,605	10,627
Paperboard/Amer. Paper Inst., thous. of tons	June 21	**593.3#**	560.9	620.8	632.3	438.8
Paper/Amer. Paper Inst., thous. of tons	June 21	**575.0#**	595.0r	601.0	577.0	402.8
Lumber/WWPA[1], SFPA[2], 225 mills, millions of ft.	June 21	**168.6#**	176.0	146.8	210.8	186.4
Rail freight traffic/Assn. of Amer. RRs, billions of ton-miles	June 21	**18.3#**	18.3	17.7	19.0	13.8
Prices						
Gold/Wed. final setting, London open mkt., troy oz.	July 2	**$661.500**	$622.500	$571.500	$281.900	$35.000
Finished steel composite/*Iron Age*, lb.	July 1	**21.739¢**	21.739¢	21.739¢	19.668¢	6.464¢
Copper/Electrolytic, del., *Metals Week*, lb.	June 28	**91.8¢**	90.6¢	97.0¢	89.5¢	38.6¢
Aluminum, primary ingot/major U.S. producer, *Metals Week*, lb.	June 28	**71.7¢‡**	71.7¢‡	71.7¢‡	58.0¢	25.0¢
Wheat/No. 2 hard, Kansas City, *Grain Market Review*, bu.	June 28	**$4.19**	$4.08	$4.14	$4.57	$1.68
Cotton/strict low middling 1-1/16 in., USDA, lb.	June 28	**71.64¢**	71.68¢	74.12¢	62.27¢	25.20¢
Industrial raw materials, 13 spot commodities/BLS, Tues. index	June 24	**268.0**	266.4	273.3	293.0	100.0
Foodstuffs, 9 spot commodities/BLS, Tues. index	June 24	**260.9**	244.1r	249.8	265.1	100.0
Finance						
AA corporate bond yield/S&P	July 2	**10.94%**	10.49%	11.02%	9.23%	5.66%
Prime commercial paper rate/dealer, 91-119 days, Fed. Res.	June 25	**8.08%**	7.97%	8.22%	9.28%	NA
Eurodollar rate/3-month, Fed. Res.	June 25	**9.25%**	8.99%	9.78%	10.68%	5.38%
Free reserves/Fed. Res., in millions	June 25	**−$127**	−$221r	−$1,089	−$1,241	$195
Money supply (M1-B)/Fed. Res., seas. adj., in billions†	June 18	**$392.5**	$389.1r	$388.3	$373.9	$181.7
Commercial, industr., and ag. loans/Fed. Res., in millions	June 18	**$163,320**	$162,543r	$161,940	$150,375	$64,471

Monthly figures

		Latest month	Month ago	Year ago	1967 average
12 leading indicators composite/Comm. Dept., seas. adj., index	May	**123.4**	126.4r	141.4	100.0
Manufacturers' inventories/Comm. Dept., seas. adj., in billions	May	**$243.1**	$242.5r	$210.9	$84.6
Constr. spending/Census Bur., seas. adj., annual rate, in billions	May	**$218.5**	$226.6r	$223.0	$78.0
Domestic air cargo/express and frt., ATA, millions of ton-miles	May	**350.3**	333.9	346.0	NA
Exports/Comm. Dept., seas. adj., in millions	May	**$17,678**	$18,468	$14,083	$2,556
Imports/Comm. Dept., seas. adj., in millions	May	**$20,528**	$19,308	$16,438	$2,239

\# Raw data appearing in the table above are seasonally adjusted in computing the Business Week Index (chart); other components (not listed) are machinery and defense and space equipment.

* Preliminary, week ended June 21 — † New series; M, has been discontinued — r Revised — ‡ Average, top three U.S. producers

1 Western Wood Products Assn. — 2 Southern Forest Products Assn. — NA Not available

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Readers report

What price loyalty?

In his article "Why Europe speaks softly to Russia" (Ideas & trends, June 16), Ulrich Steger, a Social Democrat in the West German Bundestag, states: "The Soviet Union needs 40 divisions to ensure the political loyalty of its allies. The United States needs not one single soldier."

Either Mr. Steger is naive or he believes the American taxpayer is. Any superficial loyalty displayed by our allies in Europe would very soon disintegrate if the U. S. cut its defense budget of $150 billion in half and pulled back our troops that are scattered all over Europe. Any loyalty on the part of our allies is a self-serving type of loyalty.

Robert F. Kirschner
Lakeville, Mass.

A hard deal to resist

In "Getty: Spending a windfall to diversify far out of oil" (Corporate strategies, June 23), you hit on what is an obvious, attractive way for oil companies' owners to diversify. Repurchasing outstanding shares is a dividend, very lightly taxed, that Getty owners may want to use to buy assets other than oil and gas.

No doubt in surveying his shareholders, Chairman [Sidney R.] Petersen would find a substantial number of households in favor of share repurchases. Who could beat a dividend of $45 per share (the increase in value during the past year) and more, taxed at a maximum of 28%?

Joseph Combs
Oak Park, Ill.

The UAW's hard times

In "The UAW's time of trial" (Labor, June 16), United Auto Workers President Douglas A. Fraser accepts the fact that the U. S. automobile industry (and his union) are facing hard times. One might expect him to urge greater productivity from his union members. This certainly is not the case. Instead, he advocates shifting the burden to the already overtaxed U. S. consumer by:

- Imposing import controls on foreign-made automobiles. This reduction in competition would, of course, lead to higher prices for foreign and domestic automobiles—a price increase to be paid by the consumer.
- Advocating national health insurance. Fraser admits that medical insurance at $2,000 per employee per year is a heavy load for the industry to carry. His solution: Transfer the costs to the consumer-taxpayer.

I resent Fraser's attempt to transfer the UAW's problems to the American consumer-taxpayers, many of whom are not nearly as well off financially as the UAW's members.

M. A. Pelt
Jacksonville, Fla.

A choice of cars

Your editorial "What U. S. autos need" (June 2) supporting import restrictions on Japanese cars was somewhat contradictory. You even noted in the editorial it would be unwise to risk starting "an international trade war by shutting out imports." Yet in its conclusion, the editorial suggests import quotas for the next two years, to "give the U. S. industry time to breathe."

It is doubtful that many buyers, deprived of lower-priced, smaller, fuel-efficient cars, will turn to more expensive, less fuel-efficient big cars that are in abundant supply. Restrictions on imported automobiles will simply deny American consumers that right to purchase a product that will help them conserve energy and counter double-digit inflation.

C. F. Burlingame
Torrance, Calif.

Profits under socialism

In "China seeks a new management cadre" (Management, June 16) it is stated that the development of marketing management skills is "unexpected for a socialist country." While such a development might have been unexpected within the spartan economic context of Maoism, it cannot be regarded as inconsistent with the thrust of China's current policies, or for that matter, any socialist country that seriously seeks to improve not only productive efficiency but that of subsequent consumer distribution as well.

It is frequently suggested in the West-

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ern press that profit is contradictory to socialist goals. Yet most responsible socialist economists recognize that profits fund new productive capacity. They question only the distribution of profits to the capitalist at the expense of the worker and new productive investment.

Robin Oliver

San Francisco

An incorrect rating

The article "The Arabs take their money and run" (Money & credit, June 30) contains a serious error regarding the credit rating of Procter & Gamble Co. Procter & Gamble has a triple-A credit rating from both Moody's and Standard & Poor's, not a double-A rating, as stated in your article. We have had this triple-A rating for many years.

James W. Nethercott

Senior Vice-President
Procter & Gamble Co.
Cincinnati

■ *BW regrets the error. P&G's credit rating is, and was, triple-A.*

OPEC's 'free lunch'

In "The entitlements plan has run out of friends" (Regulators, June 16), we learn that one of the architects of the energy entitlements plan, Ottie T. Vipperman Jr., is now upset because the program "discriminates" against small refiners and doesn't go far enough in equalizing crude costs.

The article fails to mention the most sinister and mindless characteristics of the entitlements plan. Since every purchase of OPEC oil is accompanied by a grant from the Energy Dept. and every purchase of domestic petroleum is penalized, the program acts as an enormous motivator for increased U. S. dependence on imported oil and for overconsumption and waste of energy at home.

In an era when politicians are pontificating about the need for reduced oil vulnerability, the entitlements plan continues to supply free lunches to OPEC and misallocates American resources. The discrimination issue raised by Vipperman is a red herring.

Steven E. Plaut

Assistant Professor of Economics
& Public Service Studies
Oberlin College
Oberlin, Ohio

The pay at the NEA

I was surprised that you did not include in your article "The inflationary push on pay for union brass" (Labor, May 12) the National Education Assn., but chose instead the American Federation of Teachers as representative of teacher unionization.

Not only does the NEA have approximately three times as many members as the AFT, but it also has been classified by the the Internal Revenue Service and the Labor Dept. as a labor organization.

It would have been interesting to see just how the NEA would have fared in comparison with other labor unions concerning the salaries for its top brass.

George C. Bevel

Director, public relations
Public Service Research Council
Vienna, Va.

■ *For the year ended Aug. 31, 1979, John Ryor, president of the 1.9 million-member NEA, earned $50,000 in salary, $20,000 in allowances, and $13,917 in expenses—a total of $83,917. The respective figures for Executive Directory Terry Herndon were $68,814, $2,943, and $13,785—a total of $85,542.*

Robots vs. humans

Your cover article "Robots join the labor force" (Technology, June 9) makes some sweeping prognostications about the impact robots will have on manufacturing processes and jobs in the years ahead.

The fact that robots were first introduced in the early 1960s in the U. S. and today are selling only about 1,850 units a year does suggest that there must be something grossly inadequate about them.

Robots will for many years be viable in limited manufacturing and assembly applications. They are slow, but getting faster; they require rigorous positioning disciplines, but are getting more tolerant as they learn to "see and feel." But the ambitious comments about replacing 50% of assembly workers with robots is somewhat reckless.

The speed, skill, intelligence, adaptability, flexibility, and tolerance of the human assembler will not be replaced by robots for years to come. U. S. industry's productivity dilemma will not be solved to any significant degree by the robot evolution.

A. P. Lehnerd

Vice-President,
advanced technology R&D
Black & Decker Mfg. Co.
Towson, Md.

No doubt displaced workers can be retrained to program, maintain, and oversee robots. But robots will eliminate more jobs than they produce.

This will ultimately be beneficial, as the baby-boom children reach retirement age and a smaller work force supports a growing population of senior citizens. However, "robotization" may pose the greatest threat to minority groups, for whom the baby boom started later and lasted longer. For these groups, a decrease in high-paying factory jobs will cut off an important access route to a better life.

Kenneth Pulliam

Santa Barbara, Calif.

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which they sell manufactured goods high. He makes little of the enormous increases in oil prices imposed by OPEC, which lay an especially heavy burden on poor countries.

Barnet concludes that, although oil won't run out in a physical sense anytime soon, it will not be produced fast enough to meet "the enormous escalation of demand" in the industrialized countries. "The world is already in the midst of a transition to a postpetroleum civilization," he writes. U. S. policy should make use of transition fuels—coal, natural gas, and, where necessary, nuclear plants—to carry out a 20-year shift from oil to a wide variety of renewable energy sources, especially solar energy. Planning and implementation should take place at the local level. Big oil and aerospace companies should largely be kept out of the transition.

The "north-south" hemispheric trade in minerals, he says, is redistributing wealth toward the already rich countries at the expense of the poor ones. The industrialized countries should agree to a mechanism for stabilizing prices and agree to pay even higher prices in compensation. They should provide low-cost credit and transfer capital and technology on a favorable basis. As for food, the U. S., of course, has an enormous advantage. Barnet says that both this country and others should shift away from agribusiness and back toward smaller farms and less energy-intensive agriculture.

Along with all this, Barnet says, the industrialized countries have imposed grossly unsuitable development models and technology on developing countries. These waste resources, create massive unemployment—world joblessness will be "the time bomb of the 1980s," Barnet feels—and benefit only small elites within the Third World. The cheap credit and capital transfer mentioned above will leave these countries to choose their own modes of development.

The book concludes with an appeal for the industrialized nations to conserve resources and adopt policies that let their poor neighbors achieve greater self-sufficiency. These are laudable goals. For example, the U. S., as many studies have pointed out, could prosper with far less consumption of energy.

But growth and the struggle for resources involve vital self-interests not likely to yield to exhortation. More important, Barnet has provided neither the factual nor the analytical basis to justify the total dismantling of the world's political and economic structures that he urges. *The Lean Years* should be read, but read with caution.

—Jack Patterson

Jack Patterson, a Senior Writer on this magazine, edits the Books department. ■

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The Western way to fly.
It's the only way to fly.

By Robert F. Yost

Inviting war by on-and-off defense

Peaks and valleys in military budgets run up the costs and breed crises. The U. S. would

"We finish each bloody war with a feeling of acute revulsion against this savage form of human behavior. And yet on each occasion, we confuse military preparedness with the causes of war and then drift almost deliberately into another catastrophe."

For the fourth time in 40 years, we have an opportunity to relearn what George C. Marshall said about national defense: When the budget for national defense falls below a certain level, we seem to invite crises and suddenly have to play catch-up ball. We habitually approach defense problems as though we could pick up a rifle and be ready for conflict, minuteman-style. This, in spite of the complexity of modern weapons and the preparation that must precede both their acquisition and their operational use.

The BUSINESS WEEK article, "Why the U. S. can't rearm fast" (Feb. 4), highlights the current status of this country's industrial readiness, and the years required to reconstitute our industrial base, obtain material resources, and develop the numbers of engineers and other skills required. Operational forces similarly require years to train pilots, submariners, and maintenance personnel, ... effective units.

GNP for defen... hardly be lost on the adversar...

■ Erosion of the industrial base. Capacity to produce materials does not keep pace with potential needs, and manpower is not trained in the skills and numbers required.

■ More costly weapons during buildups. The crash reaction and the effect of pouring additional requirements into an inflationary economy are responsible. "Never mind what it costs, just get it out the door."

■ Higher costs for weapons during a decline. The costs reflect the low production rates (although keeping the plants going provides a "warm" industrial base).

■ Erosion of operational defense capabilities.

So what is a reasonable rate of expenditure for defense, one that would preclude inviting aggression but still be a rate we could afford?

Probably 6% of GNP would be the best figure. Every time we spend below this figure, as we did before World War II, before Korea, and recently in the Middle East, somewhere a conflict breaks loose, one that affects our national interests. The 6% level may not always be enough to prevent a crisis, of course. Just before the Vietnam war heated up, the U. S. was spending 7.2%. But it should be noted that our difficulties in that war did not arise from inadequate weaponry.

Six percent represents a considerable increase from the present 5% level, about $30 billion more in absolute terms. By way of perspective, though, the Soviets have outspent us by at least $240 billion in 1980 dollars since 1968, according to Under Secretary of Defense William J. Perry. ... Intelligence Agency calculates that ...% to 12% of their GNP on ... the 1970s.

... for defense, and particularly ..., reflects more than defense ... It reflects national will. And that will may itself be a key ... conflicts.

... A given level of defense, ... other figure, is not the whole ... more defense for less (that is, ...-and-valley average). Tough ... which programs to continue and ... still required, and these are much ... a public agency fishbowl than ... environment. Policymakers must ... effect their decisions will have ... The General Accounting Office ... that incentives for capital invest... contractors are adversely affect... funding and modest rewards.

... in a way that the Russians ... something to startle and alarm us, ... launching in 1957, or something ... their masks and reveals their grand ... in 1956, Czechoslovakia in 1968, ... Afghanistan and the Middle East. ... cause us to recognize the need ... capability appropriate for a world power. But suppose the Russians waited two dozen years, instead of one dozen, between overt moves. Would we retain the lessons learned so painfully in the past? Or might we try once too often to play catch-up ball? ■

Robert F. Yost is a senior member of the staff of Computer Sciences Corp., one of the leading developers of computer software.

Drawing by David G. Klein

By Robert F. Yost

Inviting war by on-and-off defense

Peaks and valleys in military budgets run up the costs and breed crises. The U. S. would be better off with a steady level of defense spending

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For the fourth time in 40 years, we have an opportunity to relearn what George C. Marshall said about national defense: When the budget for national defense falls below a certain level, we seem to invite crises and suddenly have to play catch-up ball. We habitually approach defense problems as though we could pick up a rifle and be ready for conflict, minuteman-style. This, in spite of the complexity of modern weapons and the preparation that must precede both their acquisition and their operational use.

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A penny-wise history. The peaks and valleys in our national preparedness reflect the peaks and valleys in defense spending: a steady decline in defense as a percent of gross national product until a clear threat arises, when suddenly the trend is reversed in an expensive crash effort. Aside from obvious risks to national security, this procedure is far more costly than maintaining a sustained level.

Consider these events and defense expenditure levels. Before World War II, we spent less than 2% of our gross national product on defense. (Du Pont Co. spent more than the military services did on research and development.) The supposed savings of two decades went up in smoke in a few months of war, as we devoted more than 36% of our GNP to defense. In the postwar period, we squeezed defense down to 4.7% of GNP in fiscal 1950. We got Korea. Defense costs rose to more than 12% of GNP in 1953. After Korea, spending for defense dropped again, although not so far: to 7.2% in 1965. During the war in Vietnam, expenditures rose to 9.5% in 1968. Then began the long, steady slide to the present level: 6% in 1973, then 5.3% in 1977, and 5% in 1979.

The effects of this sawtooth profile are:

- Greater security risk. A dwindling percent of GNP for defense transmits a clear signal that can hardly be lost on the adversaries of the U. S.
- Erosion of the industrial base. Capacity to produce materials does not keep pace with potential needs, and manpower is not trained in the skills and numbers required.
- More costly weapons during buildups. The crash reaction and the effect of pouring additional requirements into an inflationary economy are responsible. "Never mind what it costs, just get it out the door."
- Higher costs for weapons during a decline. The costs reflect the low production rates (although keeping the plants going provides a "warm" industrial base).
- Erosion of operational defense capabilities.

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Six percent represents a considerable increase from the present 5% level, about $30 billion more in absolute terms. By way of perspective, though, the Soviets have outspent us by at least $240 billion in 1980 dollars since 1968, according to Under Secretary of Defense William J. Perry. The Central Intelligence Agency calculates that the Soviets spent 11% to 12% of their GNP on defense throughout the 1970s.

The level of GNP for defense, and particularly the trend in this level, reflects more than defense capability, however. It reflects national will. And the perception of that will may itself be a key factor in deterring conflicts.

The tough decisions. A given level of defense, whether 6% or some other figure, is not the whole answer to getting more defense for less (that is, less than the peak-and-valley average). Tough decisions about which programs to continue and which to ax are still required, and these are much harder to make in a public agency fishbowl than in an industrial environment. Policymakers must also be alert to the effect their decisions will have on productivity. The General Accounting Office has pointed out that incentives for capital investment by defense contractors are adversely affected by year-to-year funding and modest rewards.

It is fortunate in a way that the Russians periodically do something to startle and alarm us, as in the Sputnik launching in 1957, or something that removes their masks and reveals their grand design: Hungary in 1956, Czechoslovakia in 1968, and currently Afghanistan and the Middle East. These reminders cause us to recognize the need for a defense capability appropriate for a world power. But suppose the Russians waited two dozen years, instead of one dozen, between overt moves. Would we retain the lessons learned so painfully in the past? Or might we try once too often to play catch-up ball? ■

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Economic diary / June 23-June 27

June 23

How West Germany makes it pay to save

Economists who are wondering how to increase capital formation by raising the long-run savings rate in the U. S. should watch the West Germans. In recent testimony before the President's Commission on Pension Policy, Max Horlick of the Social Security Administration pointed out that the Germans have had a national program for "subsidizing the accumulation of assets by individuals" since the early 1960s—mainly to encourage savings to supplement social security and private pensions for the aged.

The German government, according to Horlick, adds a hefty bonus to special savings accounts that are frozen for seven years, and to which depositors agree to contribute a set amount each year. The standard annual bonus—on top of normal interest earned in the account—is 14% a year plus 2% for each of the account holder's dependent children. Besides bank accounts, savings can take the form of life insurance policies, building society shares, and corporate stock or bonds, and anyone with a taxable income below $13,000 or so is eligible to participate in the program and contribute up to $435 a year to such an account. The deposit and income ceilings are doubled for married couples, and the income limit is raised by $1,000 for each dependent child. (A higher annual bonus of 18% is paid on savings earmarked for the purchase or remodeling of a house.) In addition, says Horlick, a worker who chooses to set up such a seven-year account through his employer, by authorizing regular payroll deductions, can qualify for a 30% annual government bonus on deposits of up to $350.

By any standards, the German savings program has been wildly successful. Many low-income groups that formerly saved little if anything are now avid savers, and participation in the program soared to 16 million in 1975 from 50,000 in 1961. What is more, studies indicate that 60% of the government-encouraged accounts are maintained even after the seven-year holding period is completed.

One side note: Because the cost of the program now accounts for some 2% of total public spending, that may help to explain how Germany in recent years has managed to run larger relative budget deficits than the U. S. while achieving much lower inflation.

June 24

Cheaper mortgages fail to slow the price index

The Carter Administration has been pinning most of its hopes for a quick, dramatic break in the consumer price index on the expectation that mortgage interest rates, whose rise pushed the index to an 18% annual rate of increase in the first quarter, will exert downward pressure on the index this summer. But the decline did not show up in the CPI for May, released today, which came in at an 11% annual pace—the same as in April. Indeed, the impact of declining interest rates may not materialize before late September, when the August rate is published.

Although some posted mortgage interest rates began to decline in April, the method used to calculate home financing costs in the CPI recognizes such declines only after a lag of several months. About 85% of the home financing component is taken from Federal Home Loan Bank Board data on the average interest rate for mortgages actually closed in the month before the month of the price survey. The latest CPI, for example, incorporated April mortgage statistics, and in that month the rate for mortgages closed rose sharply to 13.51% from 12.86% in March. This produced a 3% increase in the home financing component of the May CPI. What's more, the mortgage closing rate in May, the number to be used in the June CPI, rose half a point.

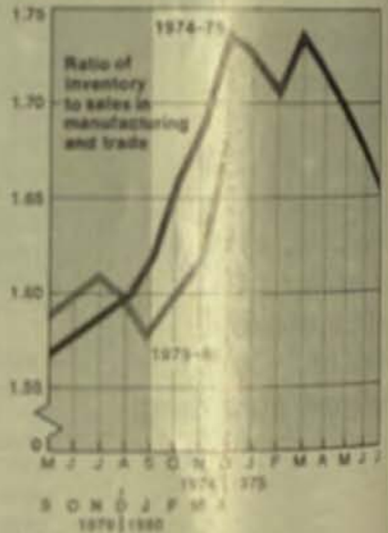
Meanwhile, the average rate incorporated in new mortgage commitments plunged to 15.91% in May from a high of 16.93% in April. Richard G. Marcis, chief economist for the Bank Board, says it normally takes at least two months before commitment rates are translated into actual mortgage closing rates. So it could be the August CPI before any big improvement shows up.

June 25

Inventories start to emit a red alert to business

It was not supposed to happen, but suddenly the level of business inventories in relation to sales seems to be climbing in a pattern reminiscent of the surge in late 1974 (chart). The Commerce Dept. reports that real inventory-to-sales ratios jumped sharply in April in most sectors of the economy—from manufacturing to retail. What is more, the hefty drop in real retail sales in May undoubtedly made stocks even more top heavy in that month. "The inventory pickup suggests that the economy may be facing a major inventory correction," says Gregory M. Kipnis, chief economist of ACLI International, the commodities trading firm. Kipnis believes that businesses have not fully appreciated the severity of the decline in demand.

A disquieting parallel to the 1974-75 recession



▲ Ratio in constant dollars
Data: Commerce Dept.

"They're cutting stocks, but not fast enough," he maintains, "so we'll see sizable additions to inventories in the months ahead." The danger, says Kipnis, is that efforts to slash inventories will result in higher unemployment that will inspire further declines in consumer spending. "If that happens," he warns, "the economy could face a typical inventory cycle that will considerably exacerbate the recession."

June 26

Some reasons inflation won't keep accelerating

Even if the consumer price index does dip to a 5% or 6% annual rate later this

Edited by Gene Koretz

year, when it finally reflects the drop in mortgage rates, observers are already warning that such a slowdown in the CPI would be a temporary phenomenon. Indeed, R. Robert Russell, director of the Council on Wage & Price Stability, recently noted that the underlying rate of inflation—determined by the pace of wage increases minus productivity gains—is now "almost 10%."

In the latest issue of Chemical Bank's *Weekly Economic Package*, however, economist Richard Scott-Ram cautions clients against concluding that the underlying inflation rate will continue to move up in coming years. For one thing, he notes that the gross national product deflator ("the most meaningful measure of inflation") has actually peaked during this business cycle at a lower level than in the preceding cycle. He also feels Washington is far more receptive to sustained monetary discipline by the Federal Reserve.

Scott-Ram also points out that productivity trends are likely to improve—if only because of the maturation of the baby boom generation and industry's smaller pollution investment requirements. And he doubts that energy inflation can continue at the record clip of recent years. He notes that the bond market seems skeptical that inflation will accelerate, since new 20- to 30-year AA utilities now yield only 11%.

June 27

As unemployment claims rise, the states get tough

The Labor Dept.'s latest tally indicates that initial unemployment insurance claims rose by 11,000 to 610,000 during the week ending June 21. This marks the 11th straight week that the claims number exceeded the peak touched during the last recession (before the program was expanded in 1978 to cover state and local government workers and other groups).

The latest claims rate is still below the 670,000 level it reached in three of the previous five weeks, suggesting that the economy's headlong plunge could be moderating. But the rate would be running even higher this year if a number of states had not tightened eligibility standards for jobless benefits. Nine states in 1979 boosted the minimum amount a claimant must have earned to qualify for benefits, and several tightened other requirements.

The Province of Buenos Aires:

Vibrant Growth and Opportunity

An area larger than Spain, with half Argentina's population and its world-famous "humid pampas" which feed ten times its own inhabitants, the Province of Buenos Aires is largely responsible for the amazing economic recovery of Argentina during the past four years. Its booming agricultural and industrial production (accounting for half the nation's GNP), is, for the most part, a result of the government's stimulus to the private sector, both national and foreign.

Few governments in history have been as encouraging to private investment as that headed by Governor Iberico Saint Jean and his Minister of Economy, Dr. Raul P. Salaberren. The results are gratifying: balanced budgets (and surpluses) for the entire four years since the present government took charge in 1976; the sale of more than 3,500 publicly-owned companies to the private sector; virtual elimination of unemployment (down to 1.5%); and the opening of the province's industrial parks, agro-industry, fishing and tourist businesses to anyone from the world over, on equal terms with local entrepreneurs.

The Province, like most of Argentina, is a middle-class "country within a nation". Its 60,000 industries range from family-type handicraft factories, to the giant Ford Motor plant which recently announced a $394 million expansion program.

The Provincial Ministry of Economy is promoting the creation of 14 industrial parks of its own, while at the same time stimulating creation of private industrial conglomerates such as that built by the Argentine Navy's Shipyards ("A[illegible]") in partnership with Allis Chalmers, 5 miles northeast of the province's capital of La Plata. North of the city of Buenos Aires (which is surrounded by the province but not part of it), Fabricaciones Militares, the Army's efficient industrial plant has established a manufacturing complex, "COMIRSA", which is one of the world's largest. And there are completely private industrial parks, like Pilar, just outside Greater Buenos Aires, which are attracting investors from throughout the world.

In contrast to this feverish industrial activity, there are areas of tranquility and centers of sport for rich and poor. One of the most luxurious is the Tortugas Country Club, on 600 acres of manicured lawn with eight world-famous polo fields. Tortugas' first two polo teams placed first and second in the world championships, and the Province itself is home to the first five polo teams of the world.

Buenos Aires Province produces half of Argentina's cereal crops, and 90% of some varieties. Its fisheries, from Mar del Plata's docks, are the seventh largest in the world. And

"Deba," the provincial power company, supplies electric power and natural gas by planning decades ahead for the steady industrial and residential growth of the area.

From its establishment as a province in 1820, and until 1880, its capital was Buenos Aires. Until 1862, the Province conducted the foreign affairs of the entire nation, then known as a Confederation. In 1882, a new provincial capital was created, La Plata, which was designed and built on high ground near the port of Ensenada. As a result, La Plata is a city of wide, tree-lined boulevards, parks and magnificent public buildings, planned by architects from the most famous art centers of Europe and the Americas.

Seek Partners

In its considerable tourist trade, particularly in the southern part of the province, the government awards concessions to the highest bidders, regardless of nationality. According to Dr. Salaberren, in some instances the provincial government, or that of the municipalities, is willing to guarantee a minimum of 8% profit to concessionaires, with no limit as to maximum gains. Nor are there restrictions on convertibility of pesos into dollars, or any other currencies.

"We offer full collaboration to private enterprise," Dr. Salaberren says. "We are in a true social revolution, and we seek partners. We are unburdening ourselves of statism, and believe firmly in the all-important role of the private sector."

Dr. Salaberren himself is a product of the private sector, having exercised only one previous role with the government, as president of the Banco de la Provincia. Both he and Gov. Saint Jean are students of the United States economy and educational systems, and each year the provincial government sends eighty of its teachers to U.S. universities on provincial scholarships.

Says Gov. Saint Jean: "We send our teachers to you so they can learn modern methods of instructing our pupils; it is evidence of our confidence in, and friendly feeling for, the United States."

In October, this year, the World Congress of Educators will stage its convention in Mar del Plata, also one of Latin America's principal centers of learning.

Opportunities in Agro-Industry

Dr. Salaberren stresses the particularly good opportunities for foreign investment which can take advantage of the enormous agro-dairy-meat production in the Province of Buenos Aires, and the ever-increasing world need for food.

Dr. Salaberren says especially good chances are offered, with government inducements, in the following fields: slaughter-house preparation of meats for export; manufacture of dairy products; vegetable and animal oils and fats; sugar refining; distillation and production of alcohol beverages; preparation of cotton fibres; processing of wool; tanning of leathers; manufacturing of rubber products; bricks, cement and limestone; and steel industries.

The Province of Buenos Aires produces more cattle and sheep than any nation in Latin America, and Argentina's ***gauchos*** are famous for their skill, energy and good humor. A typical day's ration is eight pounds of beef and ***mate***, an herb tea containing minerals and vitamins consumed in prodigious quantities.

(Above) The Provincial Subsecretariat of Agriculture operates world-famous experimental farms to constantly improve the output and quality of its crops. (Below) Buenos Aires Province harbors the world's seventh largest fishing fleet at Mar del Plata, with a nearby industrial park to process the catch.
Courtesy of Burson Marsteller

The province has enough energy, petroleum and natural gas to supply a large number of new industries, and offers space in its many industrial parks at low rates, with no charge for the infrastructure.

The industrialization possibilities of the enormous corn production of the Province can be estimated in the report of the Corn Industries Research Foundation of the U.S., which lists more than 500 products and subproducts obtainable from that versatile crop.

Among those commodities the Provincial Ministry of Economy is interested in fostering production are: flour, alcoholic beverages, solvents, paints, lacquers, explosives, oils, glues and colorants. Starches, glucose, dextrose, glycerines, animal foods, paper, carton, plastic materials, photographic film, and many forms of food, as well as medicines, antibiotics, beer, cosmetics, ice cream, and textiles are also high on their list.

The subsecretary of Agrarian Affairs under Jorge Tanoira, supervises advanced experimental farms under the research and development department. Among them, in the wheat-growing area of the province, is the Barrow Experimental Farm, with its 1200 acres, and the adjacent "Claromecó" farm, of 800 acres. This Experimental Service works on the genetic improvement of wheat, as well as oats, for animal forage and human consumption with a view to developing new crops of commercial value. The department also conducts studies on techniques in the cultivation of sunflower seed, linseed, saffron, fodder and pasturage, as well as research in the bio-ecology of plant lice and their control.

The subsecretariat supervises the departments of animal husbandry, agriculture and natural resources working actively in the field of animal health, agro-cattle emergencies, and planning for regional increases in production.

The Corporation of the Valley of Rio Colorado "CORFO", directed by engineer Norberto Kugler, provides irrigation to 225,000 acres in the extreme south of the Province of Buenos Aires. Its annual canal-cleaning tasks are equal to the round-trip distance between Buenos Aires and Miami (a nine-hour one-way jet flight). This zone raises peas, tomatos, garlic, vegetables and lettuce, and is considered a particularly attractive area for the development of agro-industry.

Tourism

Tourism in the Province of Buenos Aires is an important industry, with 560 miles of Atlantic oceanfront, and with the world-famous vacation cities like Mar del Plata, Necochea, Miramar, Villa Gesell and Pinamar. Numerous beaches with fine hotels line the entire coast.

The Men of the Economy Ministry: A Smoothly Coordinated Team

Under the overall supervision of Governor Saint Jean, seconded by his dynamic Minister of Economy, Dr. Salaberren, the Province has not only balanced its enormous budget for the past four years, but has restored more than 3,500 government owned businesses and industries to the private sector, achieved an employment average of 98.5%, and has attracted dozens of new industries, and agro-industrial enterprises to the province.

Yet, measured against the Gross National Product, the governmental budget of the Province of Buenos Aires represents only 9% of the Gross Provincial Product. The Province itself generated some 40% of the total GNP of Argentina.

In 1979, the provincial budget was distributed this way:—General Administration 22.6%; Security 11.8%; Health 13.6%; Education and Culture 23.2%; Science and Technology 0.3%; Development of the Economy 24.2%; Social Welfare 4.1% and public debt 0.2%.

The subsecretary of Finance, Jorge Tittarelli, directs the office of Fiscal and Administrative policy and Budget. The budget for 1980, not counting the 127 municipalities, is five billion dollars.

The subsecretary of Treasury, Martin Belderrain, directs the provincial branches of income, assessment, registry of property as well as the management of the lottery and the electronic data processing.

The subsecretary of Industry and Commerce, engineer Jorge Pereyra de Olazábal ,also directs the tourism department. More than 60,000 industries operate in the province, of which over 40,000 are in the Buenos Aires Metropolitan area. This has inspired a policy of decentralization with tax inducements and the cooperation of the Investment Credit Section of the Bank of the Province of Buenos Aires. Industries willing to locate away from the Buenos Aires metropolitan district are offered substantial special incentives.

Industrial Parks

The Industrial Parks of the provincial government are fully infrastructured and offer significant inducements to investors as well as the active cooperation of Mr. Pereyra Olazábal's department. The parks already in service are located in the cities of Azul, Bahía Blanca, Bragado, Carlos Casares, Chivilcoy, Coronel Suárez, Junín, Mar del Plata, Lincoln, Olavarría, Pergamino, Tandil and Tres Arroyos.

The Tortugas Country Club, home of world-champion polo teams for the past 50 years, where Argentine high society gathers on weekends to watch contests on its eight polo fields.

Tourist Magnet Mar del Plata Walks Hand-in-Hand with Industry

Characteristic of the rest of the Province, the elegant city of Mar del Plata, with its wide, spotlessly clean boulevards, one thousand hotels and lodging places, and the world's largest casino, is also an important center of industry. As a result of far-sighted projects under the guidance of Dr. Mario Roberto Russak, mayor of the city, year-round growth of the Atlantic coast metropolis is assured.

Dr. Russak, ***intendente*** of "the Pearl of the Atlantic", heads up a dedicated team of experts determined to provide year-round employment for the burgeoning permanent population. They offer a comprehensive program of incentives to Argentine and foreign industrialists to take advantage of the easy access to agricultural and sea-related products, and the city's excellent communications by highway, railroad, air and sea.

Despite the continuous growth of Mar del Plata, Dr. Russak says: "We cannot think only of tourism, although we are providing facilities to accommodate the year round boom. We are also generating programs for industry which can take advantage of our labor market, the agro-industrial potential, and the sea—Mar del Plata being the world's seventh largest fishing port yielding some 400,000 tons of ocean products annually."

The Fisheries Industrial Park at Batan, 10 miles from the city, is a center for processing and freezing fish and seafood for domestic consumption and export.

The municipality provides an attractive package to potential investors in offering portions of its 400-acre industrial zone, adding, with no surcharge, the infrastructure of water, sewage, roads, telephones, electric power, natural gas and petroleum availability. As soon as the 400 acres are parceled off, the area will double in size to include an additional 400 acres to become what Mayor Russak describes as "one of the world's most complete".

Mayor Russak's encouragement to investors extends even to Japan where he was a recent guest of the Tokyo government. Discussing plans to build major year-round tourist attractions and visiting industrial parks similar to Mar del Plata's, Mayor Russak is especially gratified by the foreign investor's interest. He also has extended his welcome to industries now located on the fringes of Buenos Aires from where they must re-locate within the next decade.

Proudly citing the advantages of Mar del Plata, Dr. Russak says: "Living conditions are pleasant here the year round with the climate varying

The world famous casino of Mar del Plata, (foreground), accommodating up to 28,000 fortune seekers at one time, overlooks Argentina's most popular beach, often crowded during the summer months of December through March.

Courtesy of Burson Marsteller

only from 9-19 degrees centigrade; we have 40 theaters, elegant residential neighborhoods, beautiful parks, camping areas and mountain ranges for those desiring many lifestyle options. Our main casino with 144 roulette tables is the largest in the world and can accommodate 28,000 people at one time. Four public golf courses, 300 restaurants, hotel accommodations for 400,000 tourists all add up to superb entertainment for the tourist or resident alike." With 26 miles of ocean beach and 24 miles of rocky oceanfront, the city meets its people's demands.

At Punta Mogotes, the municipality is developing a tourist area to include a huge water center and aquarium, and in nearby Punta Cantera they plan a five-star international hotel with a private 250-foot beach. For the latter they plan to accept bids from Argentine and foreign hoteliers next month. They request those seeking information to address inquiries to Dr. Alfredo McLaughlin, Director-General of the "Sociedad del Estado", care of the "Intendencia of Mar del Plata". The aquarium will be a 20-year concession, which, Dr. Russak says, studies show can be amortized at $500,000 annually.

Among the city's incentives to investors, some of the more attractive are the absence of red tape and the mayor's policy of paying all municipal bills at once. Investors in industrial parks are relieved at the rapidity with which applications are processed. Special tax discounts are granted to those who start construction within 180 days after signing the contract with a 10% discount on the price of land for ground-breaking within 60 days.

"In this process of development of the Argentine Republic," Dr. Russak says, "we adopted the slogan: Mar del Plata: New Impulse! We favor creative investment—and it is working."

Buenos Aires: The Province In Figures

Area (sq. miles)	117,638
Atlantic coastline (miles)	1,130
Mileage: paved roads & highways (miles)	96,500
Population	11,370,000
Density of population, per sq. mile	94
Life Expectancy, at birth: Men: 68.13 years; Women: 72.92 years; Average: 69.44 years	
Literacy Rate	97.7%
Museums: 83; Libraries: 256; Daily Newspapers: 177; Radio stations: 60; TV stations: 22.	
Number of hospitals & clinics	1,696
Number of Doctors	17,375
Farms & ranches (estancias)	93,478
Average size of each (acres)	870
Number of cattle on ranches	22,848,500
Number of sheep	9,688,881
Pigs	1,213,123
Horses	611,023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La Plata: City of Municipal Pride Encourages Industry

Municipal pride and the determination to attract industry to their city is a hallmark of La Plata, capital of Buenos Aires Province, a city of 520,000 inhabitants with a young and hard-working administration headed by Dr. Alberto Domingo Tettamanti.

Dr. Tettamanti, a 42-year-old attorney, in his first public position as *intendente* (mayor), is a product of the private sector. He and his Secretary of Government, Dr. Fernando J. Varela speak with pride of the spirit of La Plata's residents. The people have voluntarily formed 160 community *consorcios*, comprising more than 20,000 people to finance municipal paving, street lighting and general improvements—for which the neighbors spontaneously contribute the funds.

"Our people realize we, too, are amateurs bent on improving the city we all love," Dr. Tettamenti said, "and they make considerable sacrifices to finance the scores of public works we are building. Nearly 90% of them are middle and lower-income levels, but they do not hesitate to pay for the good works." The projects are financed by the city government through local banks, and the loans are repaid by the citizens. Thus, the *intendencia* pays cash to the contractors and secures the lowest contract prices.

Although the principal industrial projects in the province are promoted by the Provincial Government itself, the municipality of La Plata is anxious to attract medium-sized, non-contaminating industries to its area. Linked to Buenos Aires, only 32 miles away by excellent highways, railroad and air, it is also a major port on the La Plata River with direct access to the Atlantic Ocean.

Latin America's Most Modern

Pilar Industrial Park

Only 45 minutes from the center of Buenos Aires, and already chosen by 65 industries, of which 20% are international, the Pilar Industrial Park is Latin America's largest private industrial grouping, with facilities that have earned the praise of the United Nations and the Government of the Province of Buenos Aires.

The Pilar Park's 2,200 acres were planned and designed by a prominent Argentine engineer, Meyer Oks. It already boasts contracts with over five dozen factories, of which 12 are already in production.

A carefully completed infrastructure includes a 40,000 KW on-premises power plant, a network of natural gaslines serving every industrial plot, automatic phone system for direct dialing throughout Argentina, telex, and a complete system of paved roadways with capacity for heavy-tonnage trucks.

With the executive well-being in mind, the Pilar Industrial Park offers 40 small landscaped parks and green areas, plus a 40-acre forest preserve. Each industry locating there is requested to devote half its land to garden space. This, combined with the natural beauty of the surrounding countryside, the construction of a small golf course in the park itself, an executive restaurant, self-service cafeteria, swimming pool, bank, post office, clinic and nursery, contrives to present an unusual combination for a Latin American industrial park.

Mr. Oks points out that the Pilar Park is linked with Buenos Aires by modern super-highways and excellent railway connections. The nearby city of Pilar, with 60,000 inhabitants, has good schools, cinemas, banks, an abundant supply of skilled labor, and excellent bus service to the industrial park.

Further details may be requested from:

Mr. Meyer Oks
LAGO VERDE, S.A.
Belgrano 427, 6th floor
Buenos Aires, Argentina
Telephones: 30-2644; 30-5429; 34-9362; 34-3890; 34-9617; 34-9948; 34-2802; 34-9560; 34-6854.

Parque Industrial
PILAR
RUTA 8 KM 60

special advertising section

Breadbasket of the Free World

In response to mitigating the world's nutritional demands, the Province of Buenos Aires is preparing to increase its already enormous production of foodstuffs. "The country within a nation", whose fertile humid ***estancias*** presently produce 50% of all Argentina's cereals and 90% of some of them, has the commitment of the Province's governor, General Iberico Saint Jean and his team of eminent ministers and technicians.

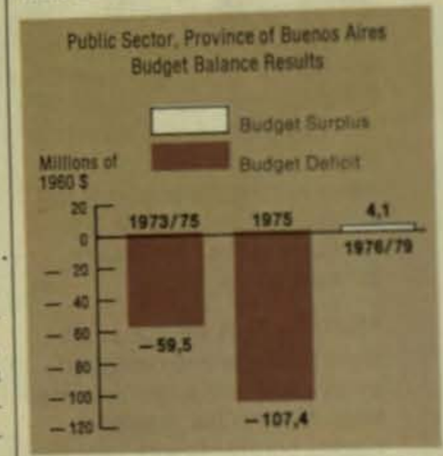
A firm believer in the role of the private sector, he has, during his four years as governor of the Province, been responsible for more than half the GNP of Argentina. His team has turned over more than 3,500 publicly-owned companies to private firms, considerably reduced the Provincial government payroll, balanced the budget and multiplied the agricultural and industrial output.

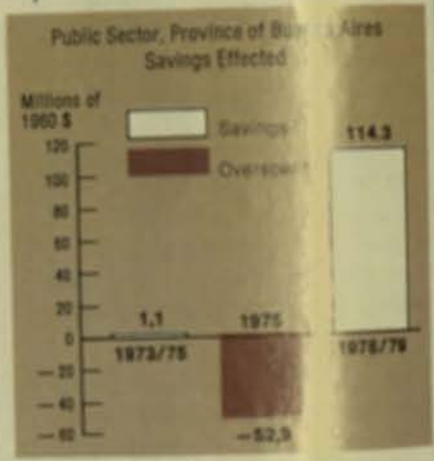
During an interview in the government palace in the provincial capital of La Plata, in the presence of Minister of Economy Dr. Raúl Salaberren, Gov. Saint Jean said the province is interested in stimulating foreign investment, particularly in agro-industry—the processing of the area's immense output of cereals, meat and by-products.

"Our 300 thousand square kilometers are astride the humid pampa, one of the world's most fertile areas," he said. "They offer great opportunity to investors with the know-how for transforming our raw materials into processed foods and merchandise. We can satisfy a large portion of the world demand for foodstuffs, as well as subsidiary products like textiles, leather goods and pharmaceuticals.

"The private investor can feel secure in the fact that the Buenos Aires provincial government believes in the all-important role of private initiative. And in addition to the many stimuli offered by the federal government, the Province provides even more advantages—particularly in areas distant from our over-populated metropolitan Buenos Aires.

"For example," Gen. Saint Jean added, "even the famous Atlantic beaches of Mar del Plata were turned over to private concessions. Plans are advanced for construction of a major bus terminal, also to be run by private concession, as well as other tourist facilities."

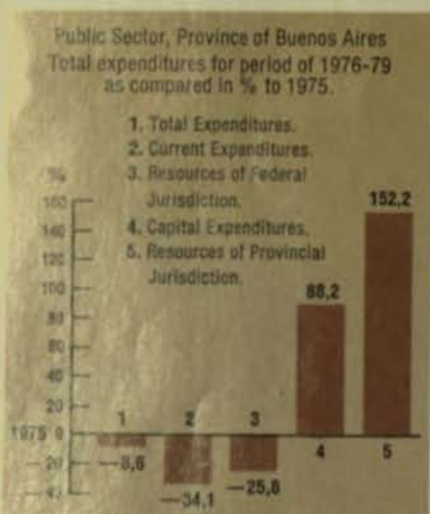




Source: Ministry of Economy, Province of Buenos Aires

Governor Ibérico Saint Jean (right) in discussion with the Province of Buenos Aires' Minister of Economy, Dr. Raul P. Salaberren (center) and journalist Stanley Ross, writer of this special advertising section.

Gov. Saint Jean, who, in addition to being an army officer with a reputation for independence, an attorney and man of notable culture, said his regime is particularly interested in attracting industry to certain cities with available skilled manpower and laborers who have demonstrated ability to learn new techniques. He cited such examples as Mar del Plata, with 500,000 permanent inhabitants (and more than one million during the summer); Tandil and Olavarría with 100,000 each; Bahía Blanca, 250,000; Necochea, 60,000 and Junín, Pergamino, San Nicolás and Juárez. All these cities boast infrastructures suitable for ex-



Ministry of Economy, Province of Buenos Aires

tensive industrial development, he said.

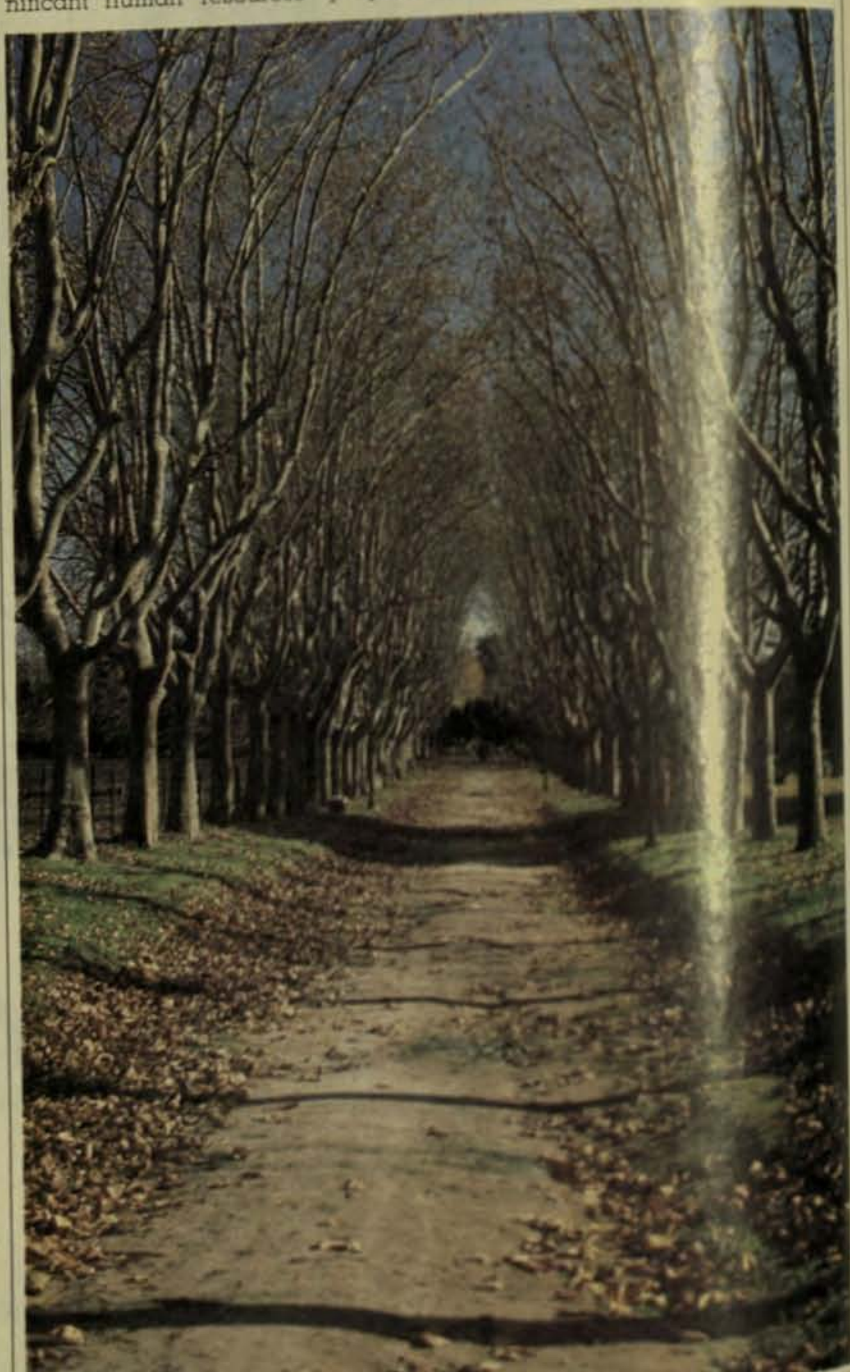
"Our nation suffered 40 years of excessive statism," said Gov. Saint Jean. "Now we must revert to private initiative. For too many years, the State managed so many businesses that the private sector lost interest and experience. Now, the government is concentrating on large public works, leaving commerce and industry to the individual initiative.

"The great sickness of statism," he added, "is accented when it becomes too paternalistic. The private sector loses initiative and the economy slides downwards. That is the affliction which today affects much of the western world." Ibérico Saint Jean has "complete faith" in the future of Argentina and the Province of Buenos Aires.

The Ministry of Economy headquarters of the Province of Buenos Aires in La Plata, one of several magnificent public buildings planned by famous European and Argentine architects when the city was chosen as provincial capital in 1880.

special advertising section

"We offer the best conditions for the production of food for a hungry world," he said. "The world deficit of foodstuffs in 1975 was 12 million tons. In 1980, the world faces a shortage of from 75 to 85 million tons. "The Province of Buenos Aires can contribute in large measure to solving that problem. We have magnificant human resources—people who absorb the most advanced techniques. We have no petroleum or energy problems. With petroleum and proteins—meat as well as cereals—we lack only the latest technology. We offer the most cordial welcome and cooperation to people from any place in the world who are willing to invest capital and know-how to this end."



There is little modesty about Argentina's **estancias**, particularly in the traditionally wealthy Province of Buenos Aires, producer of enough meat to feed 250 million people. This is the entrance road to a typical **estancia** leading to the mansion house three miles from the main highway.

Comirsa:

INDUSTRIAL COMPLEX

The Ramallo-San Nicolas Industrial Complex, "COMIRSA," located on the borders of the townships of Ramallo and San Nicolás on the right bank of the deep-flowing Parana River is adjacent to the great Somisa Steel plant.

Destined to be the most vigorous industrial center in Argentina, the Comirsa

clusive use of the plants and a telephone central with an ultimate capacity for 7,000 lines. The Complex has railway sidings and direct access to the new port of San Nicolas, assuring highway, railway and ocean transportation.

A fundamental characteristic of the "Industrial Complex," as com-

panies not only access to the present steel supply, but the centralization of interdependent industries which can contribute to the national and international economic development, making possible:

• Creation of industries under competitive conditions, taking ad-
vantage of the economies
scale and agglomera-

foresee creation of in-
tries which compen-
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the firms already established as well as those of the future.

BusinessWeek
July 14, 1980

The Province of Buenos Aires
SPECIAL ADVERTISING SECTION

For information on a particular advertiser's product or service, *circle the appropriate number* and fill in *all* the requested information below. *This card must be received by October 13, 1980.*

1. Aerolineas Argentinas
2. AFNE (Astilleros y Fabricas Navales del Estado)
3. Allis-Chalmers
4. Banco de Italia
5. Banco de la Nacion
6. Banco de la Provincia de Buenos Aires
7. Direccion de Energia, Province of Buenos Aires (DEBA)
8. ELMA—Argentine Merchant Fleet
9. Fabricaciones Militares ("COMIRSA")
10. La Plata (Municipality)
11. Mar de Plata (Municipality)
12. Ministry of Economy Province of Buenos Aires
13. Pilar Industrial Park

Name ____________________

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rate infrastructure, including a water-purification plant of enormous capacity, automatically controlled with intake from the Parana River (one of America's largest in volume of flow). Nine miles of new reinforced concrete internal roads skirt the area along with 10 miles of water pipes and sewers, a network of natural gas already in function with 1,200 cubic meters daily capacity for the ex-

activities close to each other, whose creation and future expansion is the result of careful planning. One of its objects is to achieve internal and external economies, so that the entire complex is economically viable, while certain functions of the component plants could not be viable in isolation.

Comirsa thus offers large-scale, small and medium-sized com-

The investment in infrastructure and services already made by the *Direccion General de Fabricaciones Militares* in the creation of *Comirsa* is $20 million.

More details can be obtained from:
Fabricaciones Militares
Cabildo 65
Buenos Aires, Argentina

Comirsa: INDUSTRIAL COMPLEX

The Ramallo-San Nicolas Industrial Complex, "COMIRSA," located on the borders of the townships of Ramallo and San Nicolás on the right bank of the deep-flowing Parana River is adjacent to the great Somisa Steel plant.

Destined to be the most vigorous industrial center in Argentina, the *Comirsa Industrial Complex* was planned technologically on pragmatic feasibility studies. Laid out on an expansive 6,000 acres, it offers industry unlimited opportunities. As an example of its solidity, *Comirsa* will contain auxiliary plants and subsidiaries equipped to supply spare parts, supplies and services to the major factories installed in the various sectors.

The concept of the Industrial Complex differs from that of the Industrial Park in that the latter does not provide, as a basic requirement, the technological inter-relationship among its factories. The industrial park is planned for the small and medium-sized factory. Such a park can also be created within the Industrial Complex, as in the case of *Comirsa.*

Comirsa already boasts a first-rate infrastructure, including a water-purification plant of enormous capacity, automatically controlled with intake from the Parana River (one of America's largest in volume of flow). Nine miles of new reinforced concrete internal roads skirt the area along with 10 miles of water pipes and sewers, a network of natural gas already in function with 1,200 cubic meters daily capacity for the exclusive use of the plants and a telephone central with an ultimate capacity for 7,000 lines. The Complex has railway sidings and direct access to the new port of San Nicolas, assuring highway, railway and ocean transportation.

A fundamental characteristic of the "Industrial Complex," as compared to the "industrial conglomeration," is that *Comirsa* fosters a group of interdependent industrial activities close to each other, whose creation and future expansion is the result of careful planning. One of its objects is to achieve internal and external economies, so that the entire complex is economically viable, while certain functions of the component plants could not be viable in isolation.

Comirsa thus offers large-scale, small and medium-sized companies not only access to the present steel supply, but the centralization of interdependent industries which can contribute to the national and international economic development, making possible:

- Creation of industries under competitive conditions, taking advantage of the economies in scale and agglomeration.
- Foresee creation of industries which compensate for eventual cycles which can affect the national steel output.
- Propitiate the competitive substitution of imports, and the production of goods of traditional and non-traditional exports, particularly to the Latin American markets.

The *Comirsa* plan foresees a vast building program including residential areas, a major equipment center, recreational facilities, health centers, technical schools, all of which will be implemented on a short, medium and long-term basis. In addition, the forestation program already in progress has created attractive landscaping along the internal roadways. There are power lines of low, medium and high tension to meet the requirements of the firms already established as well as those of the future.

The investment in infrastructure and services already made by the *Direccion General de Fabricaciones Militares* in the creation of *Comirsa* is $20 million.

More details can be obtained from:
Fabricaciones Militares
Cabildo 65
Buenos Aires, Argentina

Argentine Banking
Powerful Factor in World Financial Spheres

The oldest and one of the most respected banks in all of Latin America, the Banco de la Provincia de Buenos Aires is also one of the world's most active and progressive despite its standing as the province's official bank. And in recent years, it has played an ever-increasing role in world finance.

In addition to its 281 branches in the province itself, the Banco de la Provincia operates a hemisphere-wide network of agencies and branches which play a growing role in international finance.

In the United States, the Provincial Bank has an agency in Miami, and this September will inaugurate a branch at 650 Fifth Avenue, New York. Its Los Angeles branch, opened only three years ago, already boasts over $300 million in assets, placing it high on the list of foreign banks in California. The branch conducts important operations with Argentina, Mexico, Ecuador, Venezuela, Brazil, Chile, Peru, Paraguay, Bolivia, Honduras, Panama and Nigeria.

The institution's success is attributed by its President, Roberto Bullrich, to the fact that the Banco de la Provincia "offers a more complete and competitive service to those interested in foreign commerce."

"We are proud that the bank is on a firm foundation and playing an ever-increasing role as protagonist on the international scene," adds Mr. Bullrich. "Of course, an important factor on entering the money market in the United States is that we come with a solidly-established name which has always merited confidence and respect in world banking circles.

"Naturally, our advances give rise to new vistas for the future of the bank, in which the plans for opening branches and agencies abroad will have repercussions. The very approach to the New York market not only brings the vigor of our presence to the most important financial center of the world, but means we form a professional corps, enriched by experience to provide continuously better service."

Roberto Bullrich, President, Banco de la Provincia de Buenos Aires.

Despite the Banco de la Provincia being a provincial government institution, Mr. Bullrich says "we are at the service of the private sector. I personally believe the enormity of the State structure is the cause of many of our economic ills. Not only inflation, but the concentration of the economy in the hands of the government caused the structure of the country to concentrate in the city of Buenos Aires. We cannot have a socialist *and* a capitalist system: we must be one or the other. We must not only consider the dimensions of the State, but its structure as well: the welfare state doesn't work."

"We must correct the intrinsic defects in the structure of the government, so that the State performs only its primary and undelegateable functions: justice, security, public health, and education. These it cannot properly perform if at the same time it acts as an entrepreneur and businessman," he added.

The Banco de la Provincia of Buenos Aires was founded in 1822, when the country was six years old as a nation. Following Argentina's civil war in 1859, the pact of San José de Flores provided that the government of the Province of Buenos Aires was the only entity which could legislate the bank's functions.

In addition to its commercial and financial services to Argentina, the Banco de la Provincia of Buenos Aires sponsors Argentine artists and musicians, particularly the "Camerata Bariloche", a famous chamber music group which has given concerts in Washington, D.C., Miami and Los Angeles. The bank's cultural activities are conducted by the "Foundation of the Banco de la Provincia de Buenos Aires," which also finances research and studies in science, technology, art, culture, education and public welfare. Among its direct subsidies are those to the municipal children's hospitals, the reconstruction of the Argentine Theatre in La Plata (destroyed by fire), biochemical research and restoration of historic buildings. The Foundation grants scholarships, conducts courses in banking practices, foreign commerce, investment credits and data processing. Its scope extends to such economically important projects as a joint program (with the Banco de la Nacion and the Argentine Association of Regional Consortia) to give technical assistance to the country's rural farmers.

The bank's role also extends to far-reaching feasibility studies, such as that performed for the Secretariat of Planning and Development of Buenos Aires Province for the creation of a huge residential area in the delta of the La Plata River. When completed, this will be the largest urban industrial-residential complex in Latin America. Another feasibility study covers the construction of a metropolitan canal 105 miles long on the outskirts of Buenos Aires which will provide potable water for nearly ten million inhabitants, provide drainage for the area, and reduce the cost of transporting agricultural and industrial products to city markets and export wharfs.

Mortgage Department

The Banco de la Provincia devotes a large percentage of its loan portfolio to housing, having established a special department in 1911. The mortgage division boasts 295 professionals and technicians independent of the 281 branches, and 308 specialized agents in the branches themselves.

The housing mortgage division, on January 31, 1980 had a capital of $158 million, 48,544 mortgage accounts totaling $213 million and deposits of $148 million.

The high rates of inflation in Argentina in recent years have affected the programs for long-range financing, and particularly for housing. Faced with this emergency the bank inaugurated a sophisticated gamut of types of financing. To offer more alternatives, it launched on May 14, 1979 a system of "Loans on Participating Savings," which works as follows:

The bank sponsors the formation of groups of savings depositors who agree to deposit a specific sum monthly which is used to advance two monthly mortgage loans to its members.

The subscribed capital, as well as the monthly quotas, are re-adjustable until finalization of the contract, on the basis of a monthly accumulative percentage of interest. The saving plans are for 30 and 50 months, for groups of 60 and 100 depositors, and the depositor may sell or cede his account to others. The bank concedes two loans monthly, one by lot, and the other by bids to the depositor who advances the largest number of monthly payments in advance. The loans are first mortgages on living quarters in the Province of Buenos Aires, whether new or old, and the mortgages are not burdened with finance charges though they are subject to pre-established indexed corrections. The bank, however, guarantees the payments to the group by the mortgagees, so that failure to comply by any of them does not affect the group's capital.

The peculiarity of the system is that all funds deposited by the group are earmarked for specific purposes. The monthly growth of the fund and loans available are pre-fixed at the time of subscription, remaining constant. The bank's profit comes from its use of the funds during the 30 or 50-month period.

By March 25, 1980, the bank had organized 32 groups, with 3,041 subscribers. The competition among the subscribers for mortgages under the bidding arrangement is so keen that some applicants have paid up to 50% of the face amount of the mortgages desired.

Investment Credits

The bank's Investment Credits Management office, created in 1977, facilitates investment financing for industrial promotion projects, agro-industry and infrastructure in the Province of Buenos Aires, in line with the provincial government's development policies. In the general interest, the board of directors may also finance investments in Argentina outside the province itself.

The lines of credit currently in use are:

- Loans subject to the index of monetary (exchange) adjustment.
- Loans in fixed local currency amounts, with fluctuating interest rates.
- Investment loans in foreign funds.

Since establishment of the section, and until Feb. 29, 1980, the bank received 167 applications following preliminary consultation. They have finalized 42 of them, and approved 39 other requisitions, for a total of $198 million, while other applications are still being processed for an additional $3.2 million.

A breakdown of the loans according to location, excepting those related to infrastructure and services, shows that 96.23% went to the interior of the Province of Buenos Aires, while the remaining 3.77% are in the Greater Buenos Aires metropolitan area. Agro-industrial projects received 54.12% of the funds; industry 42.8% and 3.08% to the hotel industry.

The bank approved financing construction of the highway and park which will join the north and western accesses of the federal capital. This important part of the provincial infrastructure, will cost some $68 million.

Financing Municipalities

The bank also grants loans, guarantees and bonds to municipalities in the Province for urban infrastructure, public buildings, purchase of machinery and equipment for public services, and projects of general and social interest. The 127 municipalities in the Province of Buenos Aires owe the bank $147 million, much of which financed construction of schools, hospitals, libraries, old-age homes, museums, paving, drainage, water supplies, gas lines, sidewalks, lighting and telephone networks.

Support To The Primary Sector

The Banco de la Provincia plays an indispensable role in the province's basic economy by financing producers (either owners or leasees of agricultural lands). The loans finance planting, harvesting, costs of farming, administration and the winter season, and "Investment," including the cost of machinery, land, improvements, rural housing, fencing and electrification.

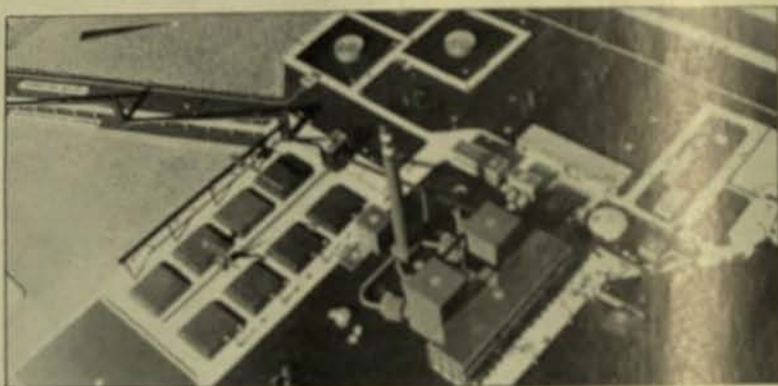
The bank will lend up to 100% of the funds on the basis of the individual's credit rating and signature, or up to 60% if the loan is guaranteed by security or mortgage. Crop loans can run to one year, with monthly, bi-monthly, tri-monthly or semi-annual payments, while investment loans extend to four years with

"DEBA" DYNAMIC POWER

The Province of Buenos Aires' government keeps abreast, and indeed, ahead of the electric power needs of the area's fast-growing industry through the "Direccion de Energia de la Provincia de Buenos Aires," known as "DEBA."

Provided with coal and low-cost natural gas, abundant water and the technical expertise of the USSR's "Energomachexport," DEBA is building a 620,000 KW generating plant, with two 320,000 KW units, in the Atlantic port city of Bahia Blanca.

DEBA's site embraces 125 acres, enough for the projected new plant, with room for future expansion on an additional 125 acres. Landfill taken from the main access canal to the Ingeniero White port is being used to elevate the site from its present 11.6 feet above sea level to 21.6 feet. This requires some 1.5 million cubic meters of fill, which is being dredged with the collaboration of the National Department of Port Construction and Navigable Waterways.



Model of DEBA's 620,000 KW generating plant being built in Bahia Blanca, to be fueled by coal from Argentine mines.

Engineer Walter Viader, general manager of DEBA, the Province of Buenos Aires' power company.

TECHNICAL ASPECTS

The boilers of the two 320,000 KW generators will be equipped to operate at "super-critical" temperatures using coal from Argentina's Rio Turbio region.

The Bahia Blanca Central will be linked to Argentina's national 500,000 volt power grid. It will serve not only the increasing local demand for energy, but also the interconnecting national power grid.

NEW FACILITIES

The DEBA power plant will have its own deepwater dock for unloading of coal and oil; storage area for coal reserves; two storage tanks each for a week's supply of fuel oil, a fully-equipped machine shop, auxiliary equipment wing; auxiliary boilers; seawater supply intake and waste disposal; chemical laboratory and warehouse.

Modern equipment for maintenance will be installed in a workshop, with a control plant for natural gas as well as a high-tension substation.

According to general manager Col. Walter Viader, who directs all of DEBA's operations, the new generating plant will also have equipment for economical output of power, plus health and first-aid installations, fire-fighting systems and complementary services.

Engineer Viader says DEBA is building a series of installations, including provision of natural gas to 30 areas encompassing all the province's industrial parks. The DEBA gas pipelines, which will be in service this year, extend for 630 miles, plus transversals, and represent an investment of nearly $300 million.

amortization of only 5% the second year, 20% the third, and the balance at the end. The payments are dated to coincide with the harvest-sale periods.

Industry

The transformation undergone by the Argentine financial system in June, 1977, caused operational difficulties to those industries which did not understand, or were slow to adapt to the new rules.

Empresarios, accustomed to operating in a market of subsidized loans, with interest rates far below the high percentage of inflation, were afflicted with short-term bank obligations which they could not pay immediately, and whose burden became serious with the sharp climb in the indexed interest rates. This became acute with the reduction in consumer buying, a result of the investing boom in the community which was created by the high interest offered by financial institutions on deposits—and which resulted in a mass volume of certificates of deposit, at as much as 90 percent interest per year.

The difficulties were serious at the start of 1978 in industries which could not service their short term debts or adapt rapidly to the new market conditions. Nevertheless, the majority of these companies had sound structure and productive capacity. This inspired the Banco de la Provincia to adopt emergency measures to sustain those in temporary straits.

To furnish help the bank analysed every situation and possibility of refinancing their debts. Terms up to four years were granted, with amortization tailored for every case, and payment of interest tri-monthly, semi-annually or annually. Complementing this policy, it cancelled punitive interest rates, from the date of application, of debtors with mortgage guarantees.

Personnel Training

The Banco de la Provincia de Buenos Aires has, since the start of the century, maintained a special section for extensive employee training and personnel development. The courses are available to all personnel, always with respect to seniority and competence. While understanding the need for trained personnel in the technical aspects of banking in the computer age, the philosophical and administrative aspects of banking, as well as general culture, are not neglected. Special attention is given to public relations, human relationships, the economy in general and the social sciences.

Argentine *gaucho* holds down a multi-champion at annual livestock show in Buenos Aires. Big winners from the Province of Buenos Aires were Percheron Postier stallions and the sturdy Criolla breed.
Courtesy of Burson Marsteller

Social Services

One outstanding feature of the bank's social program was created in 1918 to encourage social stability, and provide recreational facilities for its personnel. In that year it founded its Athletic Club, and the "Club de la Plata," and later the "Asociacion Mutualista." The Vacation Colony was inaugurated in 1943, and the Canteen-Supply House a decade later. All operate under the bank's "Social Services Commission," which stimulates social and athletic contact among the branches, and encourages cultural advancement.

The ***Mutualist Association*** provides medical, pharmaceutical and hospital service, maternity and death benefits. The association has its own sanatoria, clinics, maternity wards, laboratories, X-ray facilities, optical offices, specialized medical assistance, dentists, nursing service and non-profit pharmacies.

The bank's Vacation Colony operates summer vacation residential facilities in the mountains of Cordoba, its own hotels in Mar del Plata and Bariloche, residences in Villa Gesell, and an hotel in Buenos Aires where pensioned and present employees from the interior can spend time in the capital city.

With its Canteen-Supply House, the bank grants credits and time-payment plans to employees for the purchase, at competitive prices of food, clothing, household goods and general merchandise, both in Buenos Aires and Mar del Plata.

Personal Loans

Throughout the country the Banco de la Provincia provides personal loans to large sectors of the population, particularly professionals, artisans, farmers and cattlemen, small businessmen and industrialists, and physically-handicapped or retired people with modest pensions. In no case does the amortization exceed 30% of the individual's income.

has its first waiting list in years. Since it opened in 1892, the elegant old Brown Palace Hotel has its first serious competition—from the Fairmont Hotel, which was completed last fall. The city's downtown retail district, which has been losing business to the suburbs over the past 10 years, is being revitalized by a mile-long, $57 million transit mall that will be completed in 1982.

Even with the new sophistication, newcomers are embracing the city's cowboy heritage. Four-wheel-drive vehicles are *de rigueur*, and the only clothing brand name that confers status in Denver is Levi's.

Not all the changes are beneficial. There is a noticeable increase in traffic congestion and air pollution, and the median price of a house in Denver has gone to $60,400 from $3[illegible],900 five years ago. Old-line Denver businessmen, who once considered pinstripe suits and cowboy boots appropriate even for bankers, have spotted an alarming increase in polyester suits worn with white belts and shoes, a look old Denverites haughtily associate with Texans.

Whether the white-shoe brigade actually is from Texas is questionable, because Denver has had a heavy influx of newcomers from satellite energy cities such as Bismarck, N. D., Casper, Wyo., and Wichita, Kan. Growth is also coming from Canada as energy companies there set up south-of-the-border operations in Denver.

Energy brings big bucks

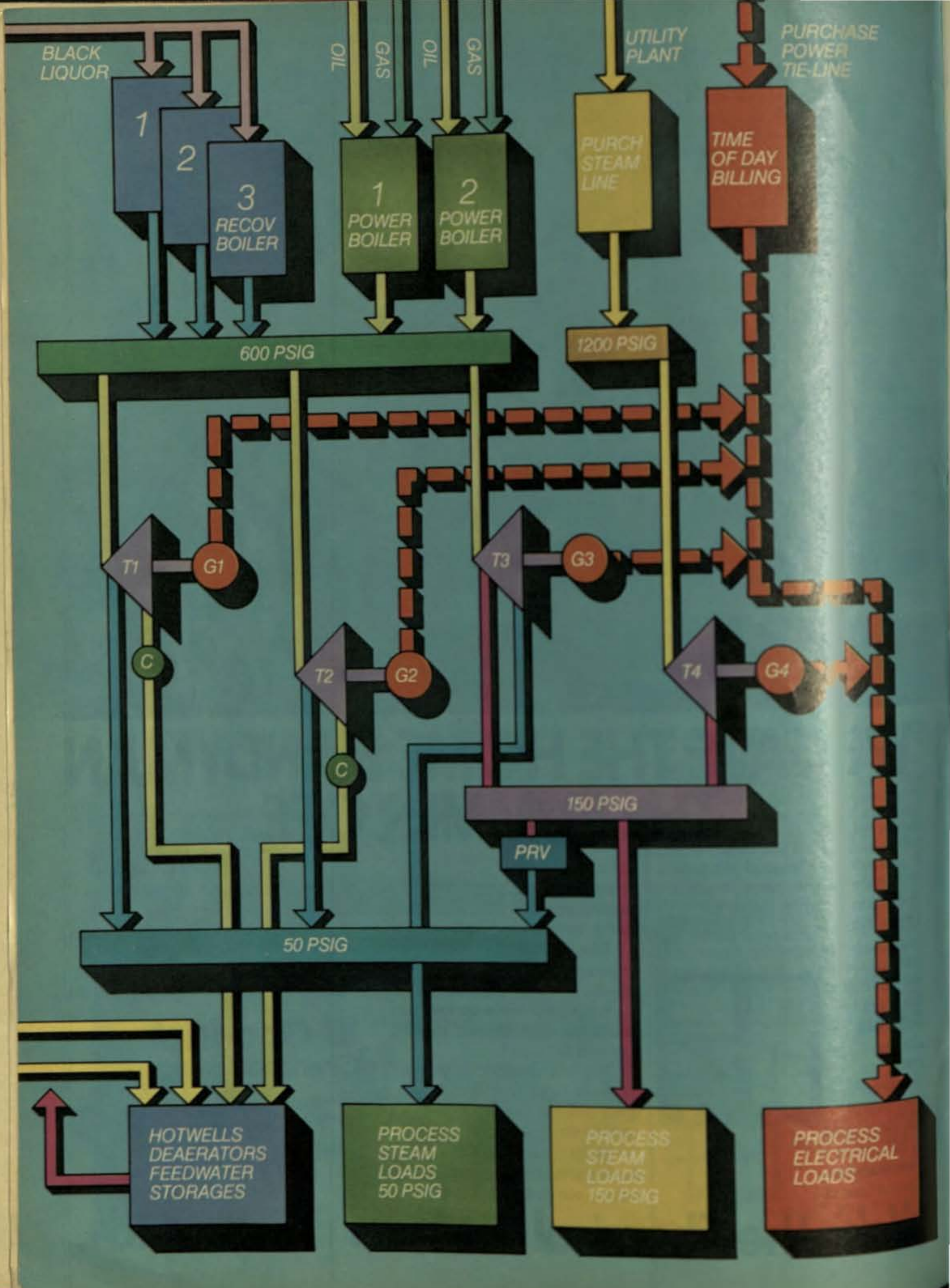
The new energy aristocracy has yet to flex much local political muscle, but it is beginning to dominate the social scene by the sheer power of big bucks. Marvin Davis, owner of Davis Oil Co. and one of the country's top wildcatters, attempted to bring the Oakland Athletics baseball club to Denver and has spent $6 million on a geriatric facility for the city. A current rumor—on which Davis will not comment—has it that he has made an offer to buy the *Denver Post*, one of the last of the independent U. S. newspapers. Davis' wife has become de facto social leader with sponsorship of the Carrousel Ball, a celebrity-studded benefit that raised $1 million in June for the Barbara Davis Center for Childhood Diabetes.

Davis, the quintessential oil man, has become such a symbol of the city's energy connection that Bob Hope, who flew to Denver in Davis' jet to attend the ball, quipped: "I know why they call Denver the mile-high city. It's sitting on Marvin Davis' wallet."

—Sandra Atchison

Atchison is manager of BUSINESS WEEK'S *Denver bureau.* ∎

LETTER


BLACK LIQUOR
OIL
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UTILITY PLANT
PURCHASE POWER TIE-LINE
1
2
3 RECOV BOILER
1 POWER BOILER
2 POWER BOILER
PURCH STEAM LINE
TIME OF DAY BILLING
600 PSIG
1200 PSIG
T1
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G4
150 PSIG
PRV
50 PSIG
HOTWELLS DEAERATORS FEEDWATER STORAGES
PROCESS STEAM LOADS 50 PSIG
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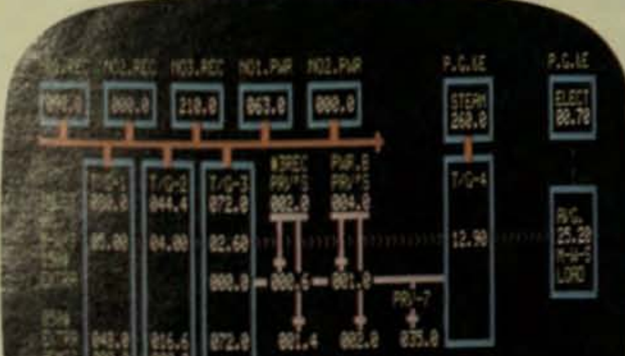

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FOXBORO

Business outlook

William B. Franklin, Chief Outlook Editor / July 14, 1980

For some industries, the bite is worse than in 1974-75

It is still the consensus of economists that the current recession will be less severe than the downturn of 1974-75.

But for a few industries—autos, housing, agriculture—it is already more severe, and some important indicators are on a faster track downward than they were at a comparable period in the previous recession.

While it is clear that there are at least several months of economic contraction still to go, it is not at all clear whether after that there will be a cyclical turning point or further months of decline.

And there is no way to tell how much output will have been curtailed by the time the bottom is reached.

The economic forecasts are mostly projecting a conventional business cycle, with recession running out its string this fall to be followed by recovery, either moderate or robust, in 1981.

But the forecasts are tainted by their failures of recent years, and they have an especially bad record in sizing up current conditions (page 88).

The leading indicators conclusively portray deterioration in business conditions and point to continued rapid declines well into summer.

The best that can be said for the most recent crop of business indicators is that they are not sinking as rapidly as they had been.

That is meager consolation; record-breaking declines could not really continue unchecked without precipitating a depression.

Order files are shrinking fast, suggesting a growing inventory problem. And signs are proliferating that capital goods have joined the recession.

Those economists who view an apparent flattening in autos and housing and a moderation in the rate of decline of the indicators as proof that the worst is over are whistling in the dark.

It may work out that way, but a slowing in the rate of decline yields little assurance that the recession will be neither long nor deep.

Commerce's index takes a record plunge

The Commerce Dept.'s composite index of foreshadowing indicators took another header in May; it fell 2.4%, following the huge decline of 4.1% in the previous month. That was the largest two-month decline in the postwar period.

Eight of the 10 sensitive indicators available for the month registered declines: number of hours worked per week, layoff rate, change in liquid assets, change in raw materials prices, orders and contracts for plant and equipment in constant dollars, real money supply, new orders in constant dollars, and number of companies reporting slower deliveries.

The two on the plus side were stock market prices and homebuilding permits.

Of particular importance among the sensitive indicators is the extensive decline appearing in data related to the industrial sector.

The layoff rate in manufacturing jumped 25%, new orders for both consumer goods and capital goods fell substantially, and companies' delivery times shortened, with only 32% reporting slower deliveries compared with 40% in April and 45% in March.

The indicators that reflect current, rather than prospective, conditions—payrolls, industrial production, real income, and inflation-adjusted business sales—are, as you would expect, in a rapid decline.

And the recession has gone on long enough now to drag in the laggers—those indicators that begin to slide after most others have already begun to do so.

This is usually a good sign. When these indicators decline, it means that imbalances in inventories and costs are beginning to improve.

But the current decline is related mostly to the big drop in the prime interest rate—one of the laggers. Unfortunately, labor costs are still rising rapidly and inventories are not yet declining.

New order slide presages summer production cutbacks

You can expect a batch of bad economic news over the next several weeks as the data for the month of June are released.

One of the first indications of the way things were going in that month appeared in the monthly report of the business survey committee of the National Association of Purchasing Management: gloom and doom all the way.

Notes the NAPM: "The economy is in worse shape than last month, especially in the new orders area."

It certainly is; some 58% of the purchasing executives reported a marked decline in orders—"the greatest number reporting a decline in the history of the reports, exceeding the previous record set in December, 1974."

They also report continued employment cutbacks, production declines, and some involuntary inventory accumulation. And although prices are still rising, only 35% of the NAPM members note increases—the smallest proportion in two and a half years.

There is a welcome trend developing here; in May, 52% reported higher prices; in April, 67%; and in March, 79%.

One unwelcome trend may be emerging: reduction in investment for capital goods. There is a growing number of companies who are pulling back on longer-term commitments.

Orders in nondefense capital goods industries declined in May, after seasonal adjustment, and were 16% below their January rate.

All major categories of heavy machinery were down significantly from their high points of earlier this year.

Even machine tools, which have been roaring along almost unchecked as conditions elsewhere deteriorated, are now moving ahead at a slower pace. In May new orders—although still well ahead of shipments—trailed a year earlier for the second successive month. They were off 11% in April and 9% in May.

THE ECONOMY

A stampede to cut taxes

To halt passage of a GOP bill, the Democrats try to devise an alternative

With the recession in full swing and the election campaign heating up, Congress is rushing to write a tax cut bill before adjournment on Oct. 1. Republicans started things off by proposing a broad bill modeled after tax cut suggestions from GOP candidate Ronald Reagan. Senate Democrats, eager to face the voters with their own program, began to develop an alternative and the Administration reluctantly gave them a go-ahead.

The Administration has maintained that if a tax cut is needed in 1981, it could be considered then. Senior officials still hope Congress will run out of time before any action can be taken this year, but the issue is a live one now.

Congressional Republicans forced it on June 25 when they began a push to enact a 10% across-the-board personal rate cut coupled with the 10-5-3 accelerated depreciation provision for business. Although the Republicans lacked the votes to pass their measure, they frightened the Democrats into beginning work on their own alternative. The Administration quickly let it be known that it would not actively oppose such legislation if Congress produces what Treasury Secretary G. William Miller calls a "carefully designed, carefully constructed tax cut."

Although there are sharp disagreements about the specifics of any tax bill, there is a broad consensus on the political imperative of action to provide both personal tax reductions and a major overhaul of business depreciation rules. Both congressional tax-writing committees plan hearings after Congress returns on July 21 from its Republican National Convention recess. But serious work on drafting legislation cannot begin until late August, after the Democratic National Convention, and that leaves only seven weeks until the scheduled Oct. 4 adjournment. Says Senator Lloyd Bentsen (D-Tex.), chairman of the new Senate Democratic Task Force on Economic Policy: "I'm not sure we can make it this year."

Bentsen (left) and Senate Democrats: Unsure that "we can make it this year."

By initiating action on a tax cut, the Republicans also defined the terms of the debate. The Republican plan is billed as a first installment on the Kemp-Roth bill—rate cuts of 10% a year for three years, with personal taxes indexed to inflation thereafter. Whatever the Democrats propose, and whatever Carter signs, must above all be different from the GOP scheme. "What we are forced to do politically," says Representative James R. Jones (D-Okla.), "is to put distance between the Reagan bill and what we Democrats accept."

The Democrats, having denounced Kemp-Roth as a tax cut for the rich and as irresponsibly large, are moving toward reductions that are smaller and more skewed toward lower-income taxpayers. One vehicle for the bulk of the personal cuts is a proposal by Representative Richard Gephardt (D-Mo.) to give taxpayers credit on their income tax for 10% of their Social Security tax payments. The Gephardt scheme would cost \$14.6 billion in calendar 1981, nearly offsetting the scheduled \$16 billion increase in Social Security taxes for that year.

Earned income credit. As a plum for low-income voters, congressional Democrats are likely to sweeten the earned income credit, which currently provides payments of up to \$500 a year for some of the working poor. This would cost less than \$1 billion, with benefits flowing to more than 7 million families. Another

Trying to camouflage the flip-flops on taxes

For weeks the Carter Administration has been worrying that a congressional rush to a tax cut would force it to abandon its opposition to legislation this year, and it has been looking for a graceful way to retreat. "We want to do it in such a way that it won't be seen as a change in policy," said one senior Treasury official shortly before the Capitol Hill dam broke.

But the credibility of the Administration's portraying its nonopposition to immediate tax legislation as consistent with its policy of fiscal restraint has been damaged by Treasury Secretary G. William Miller's rhetorical overkill. Appearing on ABC-TV's "Issues & Answers" on June 29, Miller pointed out that the Administration has been saying since January that it would consider tax relief once Congress had taken steps to restrain federal spending. Then he added:

politically popular provision that could find its way into the bill is the easing of the "marriage penalty," which causes working couples to pay substantially higher taxes than they would if they were not married.

Democrats in Congress and the Carter Administration both would like to keep the size of the total tax cut at around $25 billion, compared with the $36 billion price tag on the GOP bill. That does not leave room for both a business tax cut and full compensation for inflation's pushing taxpayers into higher brackets. Offsetting both "bracket creep" and the Social Security increase would cost $32 billion next year.

The business share of the tax cut initially will look fairly small, but it will be designed to grow substantially over the next few years. In the first year, business will probably get no more than one-fourth of the total cut, much less than the 2-1 split of the 1978 Revenue Act. "Our hope is that it gets to be 50-50 in the later years," says a Senate Finance Committee minority staffer.

Flaws in 10-5-3. Although the 10-5-3 approach—so named because it provides for a 10-year write-off for structures, five years for most equipment, and three years for some autos and light trucks—has broad support, even its crafters recognize serious technical flaws in the bill. But adoption of the principle underlying 10-5-3—ending the relationship between write-off periods and the estimated economic useful life of an investment—is virtually certain.

House Ways & Means Committee Chairman Al Ullman (D-Ore.) has already drafted an alternative that would create four depreciation classes for equipment, with write-offs ranging from 3 to 12 years. (Current law includes 133 such classes, with lives ranging up to 28 years.) For structures, the Ullman plan provides write-offs at a rate at least 35% faster than does current law; a building that now must be depreciated over 45 years could be written off in 25 years. This approach would also set forth special, greatly simplified depreciation rules for small businesses to use in writing off their capital investments.

The Ullman plan initially is more expensive than 10-5-3, in part because the latter is to be implemented gradually over five years. Revenue analysts say the Ullman method would cost $9 billion next year compared with $4.4 billion for 10-5-3. But by 1985, Ullman's "simplified cost recovery" plan would cost $25 billion annually compared with $59.8 billion for 10-5-3.

A grab bag. The likely result is a compromise between the proposals. "I think something between Ullman's bill and ours will pass," says Jones. "I'm not hung up on the details."

One reason the Carter Administration, along with some congressional leaders, had hoped to hold off action on a tax bill until next year is that there are a number of provisions floating around in Congress that could get tacked on to an umbrella tax measure. Included are major tax relief for employees of U. S. corporations working overseas, deferral of taxes on reinvested capital gains and dividends, and a tax credit for research and development. And any major tax bill always attracts special-interest provisions. As the election nears, it can become increasingly difficult to stop Congress from turning the bill into a grab bag of goodies. "It's important that the bill not be fouled up," says a senior Administration official. "That's hard to do in the days left in the session." Adds an Ullman aide: "That's the horror of doing this thing now." ■

"I don't believe, in my experience as Secretary of the Treasury, we've ever changed our economic policy."

Dennis Brack/Black Star

Miller: Denying "we've ever changed our economic policy."

Most of Carter's notorious policy reversals—the withdrawal of the proposed $50 tax rebate in the spring of 1977, the Administration's vacillating dollar policy, and its swings between criticizing the Federal Reserve for excessive restraints and for excessive ease—occurred well before Miller joined the Cabinet last summer. But the Treasury chief was involved in preparing Carter's original fiscal 1981 budget, which called for a $16 billion deficit. That budget was scrapped in two months and replaced by a new plan projecting a $17 billion surplus.

A curious alliance. Although Miller was handed the unenviable job of raising the white flag on tax action, he still hopes Congress will run out of time to complete action on a bill before it adjourns. Trying to hold back the flood, the Administration may be in a curious alliance with organized labor and the most liberal wing of the Democratic Party.

Although Miller was instrumental in designing a national accord with labor that, among other things, eschewed "general tax cuts," he is likely to find any emerging alliance an uncomfortable one. While the liberal groups are united with the Administration in their dislike for speedy tax action, they wish to see large-scale federal spending programs enacted to fight the recession. And that is the one thing the White House finds even less desirable than an immediate tax cut.

The Fed is likely to stick to its guns

The monetarist economists, who persuaded the Federal Reserve Board last October to kick its addiction to focusing policy on interest rates, are a concerned lot these days. Despite a three-week spurt in the money supply in June, the Fed has permitted what is shaping up as the biggest quarterly decline in the money supply in 20 years, and the monetarist view of the world holds that the decline may be setting the stage for a recession even more wrenching than most forecasters expect.

"I think we can compensate for what has happened. But if it continues for several months more, I think we'll have severe damage," says Lawrence K. Roos, president of the Federal Reserve Bank of St. Louis and one of 12 members of the Fed's Federal Open Market Committee (FOMC). That committee, which is responsible for the growth—or lack of it—in the money supply, holds its midyear policy review on July 9 to make whatever adjustments it decides are necessary in this year's growth targets and to set new targets for 1981.

The betting is that the Fed will stand fast, despite the money supply drop. "I don't think they're going to shift policy either way," says financial markets analyst Judith Mackey of Townsend-Greenspan & Co. "But I think they will not push as aggressively on the reserves and therefore will let interest rates move up somewhat." Allen Sinai of Data Resources Inc. expects that "a sawtooth pattern for interest rates" will continue to trend down through 1981.

Both Mackey and Sinai reason that the Fed—true to its October policy shift—has been trying to keep the money supply growing by providing reserves to the banking system at a steady clip. The problem was that the economy was so weak that nobody wanted to use the reserves.

Disagreement. Against that setting, one factor inhibiting a strong move toward stimulating the money supply and thus driving rates down is differences within the Fed on how far or fast it can let interest rates fall while still maintaining a sound dollar and orderly debt markets. In the FOMC's most recent public vote on May 6, Fed Governor Henry C. Wallich and two other members opposed lowering to 10.5% from 13% the minimum interest rate on federal funds—the excess reserves that banks lend each other overnight.

Indications are that the Fed's internal differences continue, because the Fed has let rates drift down only grudgingly as the nation's money stock has declined. The House Banking, Finance & Urban Affairs Committee estimates the drop in M1-B—currency deposits plus demand deposits plus check-like deposits—in the April-June quarter at roughly the same annual rate as the 3.2% annual rate of decline in the fourth quarter of 1959, the last time there was a comparable decline. The Fed had set a target of 5% growth in the quarter for M1-B.

Another factor auguring a steady Fed policy for now is that officials generally want a clearer picture of when or where the economy might bottom out and what tax cuts Congress might enact. Fed Governor Frederick H. Schultz, for example, says the hard-hit housing, auto, and farm sectors show signs of reaching bottom. "Things may be looking a little bit better now," he says.

Fed policy will stay steady until the economic picture becomes clearer

New York Federal Reserve Bank President Anthony M. Solomon, one of those in the minority in the May 6 vote, calls a tax cut premature. "We need to be sure that the contraction in demand will not have reversed itself even before any fiscal actions begin to have an effect," he says.

Furthermore, and perhaps most important, Fed Chairman Paul A. Volcker will have some signs of money growth to point to when he reports on the FOMC policy review to the Senate Banking, Housing & Urban Affairs Committee on July 22.

Fed officials say that preliminary reports on the M2 money measure—which adds money market fund shares and other short-term deposits to M1-B—show growth for the first half of the year to the middle of the 6%-to-[illegible] growth range targeted by the Fed for the full year. And M1-B, despite falling for the quarter, increased $6.9 billion in the first three weeks of June.

Finally, even though the money supply declined during the spring, the Fed was maintaining growth at an annual rate of about 5% in the monetary base of cash and bank reserves at the core of the money supply. ["That] means there are funds available for other kinds of monetary growth, either currently or later on," says Mackey. "As the economy picks up, you're going to see it in the money supply numbers." ∎

Economic trend

By Lewis Beman

The virtues of debating a tax cut

Election years are not noted for producing rational economic policy. Recent history, including the 1966 delay in enacting a Vietnam tax increase and the monetary overstimulus of 1972, contains ample evidence of what happens when political considerations intrude on the proper management of the economy. The idea of promising voters a tax cut before they go to the polls on Nov. 4 thus deserves more analysis than it has yet received in the partisan contest over who will get credit for the largesse.

The strongest argument in favor of a tax cut is that, in its absence, an economy struggling out of what looks like one of the deepest recessions of the postwar era will be burdened by a massive tax increase. The combination of a mandated rise in Social Security payroll tax rates, the windfall profits tax on oil, and the inflation-induced "bracket creep" suffered by personal income tax payers represents a tax rise of more than $30 billion in this calendar year and nearly $50 billion in 1981. "With the economy in deep recession," says Otto Eckstein, president of Data Resources Inc., "it would be the extreme of irresponsibility, and the worst economic policies since 1930, to let taxes increase to the programmed extent."

On that question there is virtually no debate. But not all economists share Eckstein's sense of urgency and his view that "every day of delay worsens the situation needlessly." According to Michael K. Evans, president of Evans Economics Inc., "The timing of a tax cut is much less important than its structure." Like Eckstein, he is an advocate of "supply-side" tax cuts that encourage savings and investment, and he worries that election-year politicking may produce one that is weighted too heavily toward consumption.

Quickie or retroactive. Since everyone is pretty well agreed on an effective date of Jan. 1, the basic issue is whether it would be better from an economic point of view to enact a quickie tax cut this year or to pass a retroactive one sometime in March or April. On the basis of econometric evidence, at least, it does not seem to make all that much difference in moderating the course of the recession or speeding up the recovery. According to most computer-based models, a personal tax cut has its peak effect about five quarters after withholding rates are reduced, and the lag for corporate taxes is even longer.

Although the DRI model also takes this lag into account, Eckstein thinks that in the past "the public reacted very favorably to the announcement of tax cuts well before it actually received any benefits." Such effects have been too subtle to be caught by the models, he says, but are nevertheless real enough to make the difference between a recession that bottoms out late this year and one that keeps on going well into 1981.

Inflation expectations. Thomas Juster, head of the Survey Research Center at the University of Michigan, thinks that the actual outcome of a quickie tax cut would largely depend on how consumers evaluate it in terms of inflation. "If the public thinks that inflation has been cured by the recession," he says, "the tax cut would be seen as a positive step; if the public thinks that it signals an abandonment of the fight against inflation, it would be another story."

There is, unfortunately, no way to determine how the public will actually interpret Congress' all but inevitable move to cut taxes. But the recent increase in long-term interest rates provides some evidence that the financial markets at least are worried that Washington is simply working on another turn in the stop-go cycle that has afflicted economic policy for more than a decade. In this context, therefore, the more thoroughly the tax cut is debated and the more its long-term "supply-side" aspects are emphasized, the less chance there will be that countercyclical policy will once again be counterproductive.

Mobil helps an ailing Ward into discounting

Ever since Mobil Corp. in 1974 acquired majority control of Marcor Inc., including Montgomery Ward & Co., the oil-rich parent has allowed the subsidiary to operate autonomously. But Ward's performance in recent years has been wobbly, a result of its belated entry into major regional malls, of increased competition, and of its uncertain merchandising direction. Last year, Ward's profits were nearly halved from 1978, to $54 million, on sales of $5.7 billion, and the plunge continued into the first quarter of 1980, when it lost $46 million. As a result, Mobil is taking a keener interest in the 419-unit Ward, aiding it with a new financial package and encouragement to proceed with a markedly different marketing strategy.

On July 1, Mobil granted Ward a three-year, interest-free loan of $200 million. (Mobil, which concluded the $1.7 billion purchase of Marcor in 1976, has had a policy of not making further investments in Ward and has taken great care to label the transaction a loan.) This cash infusion, plus an agreement by Mobil that Ward will pay no dividends until 1985, is enabling the Chicago-based retailer over the next five years to convert about a third of its stores into what it says will be high-

Ward's shaky performance spurred its parent to modify its hands-off policy

quality discount units. "The mass merchandiser has been doing poorly compared with the discounter, so we're making a major change in our strategy," says Gordon R. Worley, executive vice-president of Ward. "We're going to be a cut above K mart in terms of price and service. Our closest competitor may be Target," Dayton-Hudson Corp.'s fast-growing discount chain.

Modernization. In fact, Ward's radical new approach is an attempt to emulate the success of Jefferson Stores Inc., a small Florida-based discount chain it acquired in 1973. The idea behind the planned store conversions, which are called Jefferson Ward, is to combine such discount-store characteristics as central checkout and traffic-generating softgoods items with such traditional general-merchandise features as durable goods and customer services. "We feel the Jefferson and Jefferson Ward-type store has a very broad appeal," says Edward S. Donnell, chief executive officer of Ward. "There is no question that the public likes a checkout store, assuming the store does a good job of categorizing merchandise and providing help where it's needed."


Steven Goldblatt

Jefferson Ward stores will combine traffic-generating softgoods with traditional general-merchandise features.

Right now the company is operating 32 Jefferson and Jefferson Ward stores, all of which feature Montgomery Ward catalog counters. With Mobil's blessing, Ward plans to open 17 more Jefferson Ward stores early next year, concentrated in the Philadelphia area. Most of the subsequent stores, which will be either renovations of existing units or other retailers' closed-down outlets, are pegged for the East Coast, where Ward is fairly weak. Donnell expects Jefferson Ward to have about $500 million in sales by the end of 1981, with 5% to 6% in pretax income.

While the retailer is clearly pinning its future on this new venture, it must also reverse the erosion in its traditional stores. "The problem of mediocre productivity has largely been a function of having the wrong kind of store, sometimes in the wrong place," admits a company executive. Ward is doing a blitz modernization of 46 of its conventional stores, at the rate of one per week.

Expanded credit. Of course, transforming the old-line merchandiser requires huge expenditures. Until now, political criticism of pumping oil profits into nonenergy areas has kept Mobil from supporting its subsidiary earnestly. But the retailer's earnings shortfall forced Mobil to make the choice between cutting Ward's five-year, $1.2 billion capital program or reversing its hands-off posture.

The $200 million transfusion will be used to reduce Ward's short-term debt. The retailer's interest expense jumped by $60 million in the first five months of the year and was responsible for much of the first-quarter loss. But without the loan, and the release from paying dividends (which have amounted to 40% of Ward's profits), the Jefferson Ward program would have been severely curtailed.

A side benefit to stressing the new discount approach is the likelihood that it will cut Ward's accounts receivable, which were running at 56% of total sales last year. This is troublesome, say company insiders, because customer balances are larger than for most retailers. Furthermore, the retailer announced on June 30 that it would also begin accepting MasterCard and Visa cards nationally.

With the recession throttling consumer spending, all retailers are nervous. Ward, comforted by some of Mobil's muscle, and having finally decided on a merchandising strategy, is feeling a little better. "We feel there is a place between the discounter and mass merchant for a retailer who can offer variety and quality at a lower price," says Donnell optimistically. "And we think we have a distinctive product." ■

The painful collapse of an anti-IBM merger

The decision on June 27 to call off a merger agreement between Storage Technology Corp. (STC) of Louisville, Colo., and Amdahl Corp. of Sunnyvale, Calif., leaves both companies vulnerable to the tactics of industry leader International Business Machines Corp. Indeed, Japan's Fujitsu Ltd., which owns 26% of Amdahl and was the spoiler in the deal, is the only company to benefit.

Fujitsu asserts it was not opposed to

the proposed merger, pointing out that its representative on the Amdahl board agreed at a May 6 meeting to join with STC to form a new company. Privately, however, a Fujitsu official complains that when it agreed with Amdahl to cross-license patents and knowhow on semiconductor technology in December, 1978, "no merger [of Amdahl and another company] was contemplated and it was under that condition that the agreement was made." When Fujitsu apparently failed to obtain guarantees that it would remain Amdahl's principal supplier of components and continue to assemble certain subsystems for Amdahl's huge mainframe computers, it quashed the deal by threatening to sell its Amdahl shares. "I was willing to proceed with them or without them, but the Amdahl board felt it could not proceed without Fujitsu," says Jesse I. Aweida, chairman of STC. "So," he adds, "we aborted the whole thing."

The failure leaves Amdahl and Storage Technology vulnerable to IBM's tactics

Integration hopes. If the merger had gone through, the new corporation would have been an $800 million company with enough clout to stand up to IBM (BW—Apr. 14). Amdahl makes large computers that offer more power for the money than IBM's but that work on IBM software. STC would have complemented this capability with tape and disk memory products that are the key peripherals for any computer system.

By joining forces, the companies hoped to offer customers a more integrated approach to computer systems and so compete more effectively against an increasingly aggressive IBM. Instead, "they are back in the corner where they were before, and it won't be a viable corner for a very long time," says Jean Michel Gabet, an independent computer analyst. He explains that both companies "really needed the economies of scale that the merger would have given them."

To make matters worse, IBM recently announced software and other improvements for its top-of-the-line 3033 mainframe computer—which makes life tougher for Amdahl. And on June 11 it rolled out new disk drives that will pack twice as much information onto a disk as its existing products do. "The recent announcements of IBM made life a little more difficult for both parties," concludes Frederic G. Withington, a vice-president at Arthur D. Little Inc.

Survival at stake. "I guess we're back to square one," concedes John C. Lewis, president of Amdahl. But he is quick to insist that the merger was a means to diversify rather than to survive. One Wall Street analyst, however, believes that for Amdahl, survival means diversification, because Amdahl is a one-product company—and that one depends on the generosity of IBM. Competitive pressures from the giant have already eroded Amdahl's profits. First-quarter earnings fell to $449,000 in 1980, compared with $13.5 million for the same period in 1979. And long-term debt soared to $71.6 million compared with $28 million at the end of the first quarter in 1979.

This is not the first time that Amdahl has tried to hook up with another company and failed. Last fall it wooed STC's arch-rival, Memorex Corp., and was on the rebound when it became engaged to STC.

Although Storage Technology also tried unsuccessfully to capture Memorex, industry experts say its failure has not left it as vulnerable as Amdahl's. Indeed, first-quarter earnings in 1980 were up 20% to $9 million on a revenue gain of 30% to $124.7 million, compared with the same period a year earlier. STC watchers note that IBM is at least one year away from delivering its new memory disk, giving Aweida some breathing room. The flamboyant entrepreneur is already planning his next move. "I see nothing wrong with pursuing another acquisition," he says. "We just put several [acquisition possibilities] on the side, and we will probably reactivate them." ■

METALS

Copper's COLA issue precipitates a strike

Labor settlements in the steel and aluminum industries earlier this year raised hopes for a similar outcome in copper. But the hopes were blasted when a strike began after three-year contracts expired at midnight on June 30, and, from all appearances, the walkout could last several months.

The strike came as no big surprise to industry observers. Not since 1961 has the industry concluded a labor pact without a strike, and the current low level of copper demand and the high level of inventories clearly limit the immediate costs to producers of a work stoppage. Indeed, most experts feel that domestic copper prices, which fell some 40% after reaching records last February, would be lower if the possibility of a strike had not threatened to cut supplies. "We could have been looking at a 75¢-per-lb. producer price instead of 90¢ to 94¢," says Jeffrey M. Christian of *Metals Week*, a McGraw-Hill publication.

Still, some observers felt that the industry's healthy profits last year and early in 1980 and its rosy long-term outlook might induce it to avoid a strike—particularly if producers felt that the current recession would prove short-lived. And they reasoned that the gap between the aluminum settlement and the less-generous steel industry contract provided ample bargaining room on copper for the union coalition, led by the United Steelworkers, to settle before the deadline. "A quick resolution [of the strike] could still happen if one of the major companies caves in, like Kennecott [Copper Corp.] did in 1977," said one metals trader.

A stumbling block. That, however, is highly unlikely, because a key difference between the aluminum and steel settlements has stymied the copper talks. The USW's pact with the ailing steel industry weighed in at about a 35% increase over three years, assuming 10% inflation. The aluminum pact cost somewhat more. And the union agreed to give up a pending 33¢-per-hour cost-of-living adjustment (COLA) payment to help pay for the new steel settlement, while it made no such concession to the aluminum companies.

Insiders report that the diversion of COLA money to other benefits is the chief stumbling block. Noting that the United Auto Workers granted the auto industry a similar concession, copper companies demanded that the unions agree to divert a 29¢-per-hour COLA payment, due on July 1, to help pay for increased pensions and other benefits. Such a diversion would also lessen the perverse effects COLA is having on labor costs and worker productivity in a period of high inflation, the companies argued. "COLA is killing us because it compresses wages for hourly workers and puts upward pressure on salaried workers," complains a company negotiator. The companies say many workers are refusing promotions because COLA has cut the differences between job categories.

The duration. For their part, union representatives, who solidified their bargaining stance earlier this year when copper prices were at records, refuse to give an inch on the COLA issue. "We consider steel a special situation," says Cass Alvin, a USW staffer. "They've got economic woes nowhere comparable to the profitability of the copper industry." Wage offers of 70¢ to 75¢ per hour over three years are about 15¢-20¢ an hour below union demands, but the industry may go higher if it wins the COLA diversion.

Meanwhile, some industry observers are betting on a strike of at least four to six weeks, and maybe longer—on the theory that it would take that long to work off excess stocks in the U. S. market. But metals analyst George H. Cleaver of Merrill Lynch, Pierce, Fenner & Smith Inc. calculates that free world producers' stocks are about double their normal levels—"and there's no telling how much copper there is farther downstream." Thus, Cleaver thinks, "we could have a strike of four or five months' duration without undue hardship."

As for copper prices, they jumped to 92¼¢ per lb. on the New York Commodity Exchange in the wake of the strike announcement, fell back, and then wavered around 93¢. At the same time, several producers, led by Phelps Dodge Corp., raised their tabs to 97¢ in the hope that speculative demand would lift prices. Most observers, however, believe prices will hover at current levels for at least several weeks, although they concede that a longer strike could push them considerably higher. ■

RESOURCES

The politics behind Carter's energy losses

Since the beginning of his term, President Carter has depended on a coalition of moderate Democrats and Republicans for his modest successes in getting his energy proposals enacted (table). Now, with the election four months away, Republican support is crumbling. The first casualty was the June 27 House vote recommitting the Energy Mobilization Board (EMB) to conference committee and all but killing it. The next victim may be Carter's proposed "oil backout bill," which would give federal aid to utilities that decide to convert from oil to coal.

In the House vote, only nine Republicans supported the measure, resulting in its defeat by 232-131. Comments David A. Stockman (R-Mich.), an influential member of the Commerce Committee: "We have been dished out one bureaucratic expedient after another. We're

The fate of Carter's energy proposals

Issue	What Carter proposed—and when	Outcome in Congress
Gasoline tax	Standby tax of 5¢ to 50¢ to take effect if consumption exceeded targets (1977)	Never acted on
	Oil import fee to be passed through to consumers at 10¢ per gal. (1980)	Rejected
Conservation	Residential, commercial, and industrial tax credits for spending related to conservation (1977)	Adopted with minor change
	Federally mandated utility rate reform to encourage conservation (1977)	Energy Dept. given authority only to propose rate reforms to states
	Special federal banks to provide loans for solar and conservation investments (1979)	Adopted with minor changes
Oil prices	Extension of price controls on some oil, combined with decontrol of "new" oil and a crude oil "equalization" tax to bring U.S. consumer prices to world levels (1977)	Rejected
	Gradual decontrol of crude oil prices by executive order, combined with windfall profits tax (1979)	Accepted with some changes
Natural gas prices	New gas to be priced on a par with crude oil, with controls extended to intrastate sales and higher prices charged initially to industrial users (1977)	Gradual phaseout of price controls by 1985 with controls extended intrastate in the interim. Industrial users to pay more initially
Coal conversion	New plants fired by oil or gas to be barred and conversion of all coal-capable plants to be mandated. Utilities to be banned from burning gas after 1990 (1977)	Passed but watered down
	$10 billion in grants to utilities to pay for conversion and to build new plants (1980)	Senate adopted a $4.2 billion conversion plan and softened earlier curbs on gas use. House has not acted
Gasoline rationing	Standby plan to allocate fuel to all registered vehicles plus a "white market" for coupons (1979)	Rejected
	More complex standby plan allowing some "white market" coupons and providing for regional differences in driving and some special tax treatment (1980)	Pending. Acceptance likely
Synthetic fuel	$88 billion in federal subsidies to aid development with funding administered by a government corporation (1980)	Accepted, but at $28 billion level now with more later
Expedited licensing	Energy Mobilization Board to be set up to help cut red tape (1979)	Pending. Acceptance unlikely
	Licensing for nuclear plants to be speeded and incentives to be established to standardize reactors (1978)	Never acted on

finally getting fed up." But Energy Dept. General Counsel Lynn Coleman sees it another way: "Something was operating on them other than the merits. They saw a chance to embarrass the President."

Administration officials admit it will be tough to resuscitate the EMB in an increasingly political climate, and supporters of the Administration's oil backout proposal—which would provide $10 billion in federal funds to wean utilities from oil—are worried about a repeat of the EMB kind of partisanship. "The EMB vote disturbs me," says Kevin Rooney, legislative representative for the Edison Electric Institute. "It's essential that this not become a partisan issue."

Giveaway? Nonetheless, all signs are pointing to the oil backout bill's becoming just that. Not a single Republican on the House Commerce Committee, which still has the measure bottled up, is now supporting the Administration proposal. The main Republican complaint is that the bill is an unnecessary giveaway to the electric utilities. The Administration would have given $4 billion in grants and loan guarantees for converting existing electric plants from oil to coal and $6 billion more for building new plants or adopting other measures that would cut back on oil use. The Senate dropped the funding for new plants but agreed to a $4.2 billion program for converting existing units.

The Senate also passed an amendment that overturns a ban on the use of natural gas by utilities after 1990; in addition, it allows more gas to be burned now. The amendment was the key to the 83-7 vote for the oil bill. Normally, such an amendment would also attract Republican votes in the House, since those legislators have long opposed the federal ban. But so far Republicans are not going along. "Sooner or later we have to change that off-gas provision," says Stockman. "But there's ample time and opportunity to do that in other forums." ■

Commentary

By Daniel B. Moskowitz

High court rulings are robed in indecision

There may be good reasons why, in the term ended July 2, the nine justices of the U. S. Supreme Court decided at least 11 cases without managing to agree on a majority opinion. In what business looked on as the most important case of the term—a review of the safety standard for benzene—the five votes to overturn the Occupational Safety & Health Administration standard came in three separate opinions. The majority could not agree on such a basic issue as whether a standard has to save more in human life than it costs in order to meet legal requirements.

Lawyers are becoming increasingly concerned about the surge of plurality opinions. Such splintered decision-making means that executives looking for firm guidance from company lawyers are being told that the answers are just not coming down from the high court.

Little help. Problems come when the justices do not pull together. Supreme Court opinions are increasingly leaving a wake of confusion. In the U. S. system, the high court decides real cases based on solid facts and arguments by warring opponents; it does not answer hypothetical legal questions. But resolutions of actual conflicts are supposed to set out general rules to settle future conflicts—and to define what is lawful.

It has been characteristic of the court since Chief Justice Warren E. Burger and his three fellow Nixon appointees joined it that, as Harry S. Gerla of the University of Dayton (Ohio) Law School puts it: "In an excess of caution, they've decided the cases on the narrowest possible terms." The new tendency toward issuing plurality opinions compounds the problem. This term seven justices said that an employee collecting workers' compensation from the state where he was injured can get supplemental payments from his home state. But the majority split 4-3 on their reasoning, providing little help for other companies. On July 2 a majority that approved congressional action setting aside public works jobs for minority-owned contractors could not agree on the constitutional standards to be applied. On the same day, the court by a 7-1 vote curbed the power of judges to close trials to the public, but because four separate explanations were provided, the ruling will inevitably prompt still more litigation on the issue.

Explanations are at the heart of the court's role. The justices write opinions in fewer than 200 cases a year while, at the other end of the judicial system, close to 200,000 new cases are filed in federal district courts annually—and almost 5 million in state courts. Since few of those matters will match precisely the facts of the cases the high court decides, the nation gets something approaching uniform justice by lower courts applying the principles of the Supreme Court rulings. Simply picking a winner and a loser is the lesser part of the justices' job. Plurality opinions leave trial judges floundering, not knowing what the high court really believes. They also mean that judges on the firing line "can justify just about whatever they want to do, based on one or another of the opinions," warns Gerla.

Public confusion. That spells trouble for businessmen and other private parties who "want to conduct their policy to avoid getting in the courtroom," notes Bruce Fein, a Justice Dept. antitruster who moonlights as an analyst of Supreme Court decisions for the American Enterprise Institute.

There are a lot of reasons why the present court has trouble pulling majorities together. "It reflects the difficulty and the fundamentality of the issues involved," explains Professor Robert A. McCormack of the Detroit College of Law. It also reflects the absence of any commanding presence who can pull his colleagues along in a close vote. But, in addition, there seems at the moment to be a belief among the justices that it is just not important to bury differences and get together on a majority opinion. Even though Justice Lewis F. Powell Jr. admits that "the court fairly may be criticized for the increasing number of dissenting and concurring opinions," he insists that state of affairs is better than "a court whose members were dominated by a willful chief justice."

The current splintering is part of a transition process during which the court is moving away from the activist days of the Earl Warren court, which emphasized the importance of individual rights. The justices are rethinking the court's former positions, and have yet to reach a consensus on many issues. "In the hierarchy of values, it's a lot more important that they take their individual views seriously," argues Gerald Gunther, the Stanford University Law School constitutional authority. He believes "the country can live with that kind of uncertainty for a few years."

CAPITOL HILL

The unlikely alliance blocking lobby reform

Cynical Washington lobbyists admit that the 1946 law requiring them to register with Congress and record their lobbying expenditures is hopelessly weak. But those same lobbyists—in an uncomfortable coalition of just about everyone from business representatives to consumer activists—have managed for six years to thwart efforts that would force them to make more detailed disclosure of their activities. This year the 5,000 registered lobbyists on Capitol Hill seem to have scored another victory, as prospects for legislation pending in both the House and the Senate fade away.

The bottleneck now is in the Senate Governmental Affairs Committee, which in several tumultuous sessions voted to knock out key provisions of the Senate lobby bill. Without those provisions, Senator Lawton Chiles (D-Fla.), sponsor of the measure, says he will not bother taking the legislation to the full Senate for a vote. A weaker version is ready for floor action in the House, but leaders of that chamber refuse to act until the Senate does.

The House is understandably unwilling to go out on a limb again; it has already produced two lobby reform bills that the Senate either opposed or ignored. Both measures were strongly resisted by the lobbyists they would have affected. With the exception of Common Cause and the AFL-CIO, nearly everyone who buttonholes members of Congress or prepares position papers objects to tough lobby reform. "Lobby disclosure is an issue that has tended to unite lobbyists no matter what hat they wear," says Fred Wertheimer, senior vice-president of Common Cause.

Lobbyists of all stripes are now meeting weekly to stop a Senate reform bill

In fact, an informal group of lobbyists representing all points of view meets weekly to discuss strategy on the Senate bill, and 107 organizations ranging from the American Horse Protection Assn. to the National Association of Manufacturers recently signed a letter to members of the Senate committee laying out their objections. But they have an uncomfortable liaison. "It's awkward to find ourselves lobbying next to people we have nothing in common with and [whom] we loathe," says William A. Butler, general counsel of the Environmental Defense Fund.

Two elements of reform particularly disturb just about every Hill lobbyist. One would require groups to disclose their efforts and expenditures in generating grass-roots pressure—the letters and telegrams to Congress that have become such an effective lobbying technique. The other unpopular element would require lobbying organizations to list groups that give them more than $3,000 per year in dues or contributions, along with the amounts.

'Mountain of detail.' These two provisions will probably be proposed as amendments to the House bill if it is voted on, but both were defeated by close votes in the Senate committee. The remainder of the Senate bill, which closely resembles the House legislation, would cover organizations that spend more than $5,000 per quarter on lobbying or whose representatives have 13 or more meetings a quarter with members of Congress, their staffs, or executive branch officials. Those groups would be required to report all lobbying expenditures, including gifts, spending for social occasions, aggregate lobbyists' salaries, and the cost of written communications. If an organization spent more than $5,000 in solicitations alone, it would have to list that cost, with a separate subtotal for paid advertisements, and state the issues for which solicitations were made.

Small lobbying groups say the paperwork imposed by those conditions would be far beyond what they could afford. They point out that, even though there is a $5,000 reporting threshold, they would have to keep track of all their expenses just in case they crossed the spending line. Larger groups also claim the paperwork would be excessive. "It would be a mountain of detail," says Robert S. Hatfield, chairman of Continental Group Inc.

The most controversial provisions, however, are the grass-roots and dues disclosure requirements. They will be proposed again in modified form when the Senate Governmental Affairs Committee meets during the week of July 21, and their fate may spell the future of lobbying reform this year. If they fail, says Committee Chairman Abraham A. Ribicoff (D-Conn.), a supporter of lobby reform, "I think we're better off without any new lobby law." ■

Senator Chiles: Two controversial provisions are the key to his lobby reform bill.

Gwendolyn Stewart

UNIONS

Auto workers head for the welfare rolls

Hundreds of thousands of laid-off auto workers will be running out of their various unemployment benefits by late summer and could find themselves on welfare rolls this winter—a fate they largely managed to avoid in the severe 1974-75 recession.

Some 250,000 blue- and white-collar workers are currently laid off with no call-back dates by General Motors, Ford, Chrysler, and American Motors, roughly a quarter of normal Big Four employment. An added 50,000 auto workers are on temporary layoff, and this number will climb as auto plants close for extended model changeovers. The United Auto Workers says that 200,000 additional workers are laid off from independent parts-supplier plants. The total of about a half-million auto layoffs already equals the number that was idled at the trough of the last recession.

Pockets of layoffs. Under normal layoff conditions, auto workers receive state-paid unemployment compensation (UC) and company-funded supplemental unemployment benefits (SUB) totaling 95% of weekly take-home pay (minus $12.50 for work-related expenses not incurred on layoff) for up to one year. In Michigan, a typical assembly line worker with a family of four, who received weekly after-tax pay of $292, collects $265. Workers who qualify for federal trade readjustment assistance to those idled by imports receive TRA payments of $270 per week instead of UC and SUB, although TRA often is delayed until months after a layoff starts. In the past year, 300,000 auto workers qualified for TRA.

But these programs are running out of money. Melvin A. Glasser, the UAW's social security director, declares: "We

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Steve Hart—BW

are impoverishing people by forcing them onto welfare." In Michigan, however, welfare is restricted to families with less than $2,000 in assets, leaving only food stamps as an available benefit program for some workers.

The basic problem is that, with high unemployment so far concentrated in such pockets as Detroit, there has been no broadly based political support for beefing up the jobless programs. UC payments last only 26 weeks in most states, with another 13 weeks paid for by the federal government becoming available as unemployment rises. But Congress seems unlikely to approve further extensions this year. In the last recession benefits were quickly stretched to 52 weeks and even 65 weeks in areas of high unemployment. The cost of each 13-week federal extension is $1 billion to $4 billion, depending on the jobless rate.

To cut costs, the Labor Dept. has, in effect, raised the unemployment rate "trigger" for extending benefits beyond the first 26 weeks. While this might not have a significant impact nationally, it did cause 48,000 furloughed workers to be lopped from extended-benefit rolls in New Jersey.

Depleting funds. Across the nation, roughly one-third of all laid-off auto workers have already exhausted their UC payments. Analysts at the Michigan Employment Security Commission predict that at least 250,000 workers in that state will run out of benefits this year, compared with less than 200,000 in 1975. The sooner UC expires, the sooner company SUB funds must increase payments to keep weekly benefits at 95% of take-home pay, and this is taking its toll on the funds.

Prolonged layoffs forced Chrysler Corp. to halt SUB payments to workers with less than 10 years of service from August, 1979, to last March. Ford is expected to announce SUB cutbacks by July 4 for less-than-10-year workers, 90% of its 60,000 furloughed employees. General Motors Corp.'s fund, which went broke for 18 months in the last recession, may have to restrict payouts by September.

The SUB fund drain was aggravated in recent weeks by a depletion of federal funds appropriated for trade adjustment benefits this year, because of the lag on TRA payments. The SUB funds make payments in lieu of TRA in the interim, and although workers are required to reimburse the SUB funds when the TRA checks finally arrive, it is all but impossible for companies to collect from workers who permanently lose their jobs. GM, for instance, is still trying to collect $1.5 million of the $14 million its SUB fund disbursed as TRA payments in the last recession. This time, the company funds could lose hundreds of millions of dollars, union sources say.

The resumption of trade adjustment benefits in states where funding has run out hinged on final congressional approval of a $1.4 billion supplemental appropriations bill. ■

AVIATION

OMB strafes the F-18 as its price tag soars

In a dramatic example of the impact of inflationary costs on new weapons systems, the price of McDonnell Douglas Corp.'s F-18 fighter aircraft is now so high that some Office of Management & Budget analysts are recommending that the plane be canceled before production of it starts later this year.

Politics will probably dictate otherwise. But there is no doubt that the F-18, once billed as a lightweight, low-cost plane ideal for both the Navy and the Marine Corps, is now nearly the most expensive fighter ever purchased by the U. S. At the beginning of 1980, the Navy estimated it would have to pay $24 billion, or $17.4 million apiece, for the 1,377 F-18s it would buy in the 1980s. It has now raised that estimate to $31 billion, or $22 million a plane, about the same price as the much-heavier Air Force F-15, which has been in production for five years. "What it comes down to," admits one Administration official, "is that the Navy will either have to buy fewer F-18s than it planned or it will have to scavenge for funds [to buy them] from somewhere else in its budget."

Expensive stage. That will not be easy, however. And, in addition, the escalation in the price of the aircraft may not be over. Inflation has caught the F-18 at the worst possible time, just as its producers were tooling up and buying materials to build the plane. Inefficiencies are always greatest at this stage of a plane's production run. And the F-18 is not expected to be an exception to that rule.

In a recent report to Defense Secreta-

Why Pratt & Whitney is high on its new engine

If the F-18 goes into production, there is little chance that the U. S. will fund another new fighter aircraft in the 1980s, or maybe through the rest of the century. But that is not deterring the Pratt & Whitney Aircraft Group of United Technologies Corp., which plans to spend hundreds of millions of its own funds over the next three years to develop a new engine that is smaller and more powerful than the F-18's F-404 made by General Electric Co.

With or without cancellation of the F-18, Pratt & Whitney sees a potential market for 4,000 to 5,000 aircraft engines in the 20,000-lb.-thrust class over the next 20 years that includes:

- The FX export fighter, which both General Dynamics Corp. and Northrop Corp. have been cleared to build by the State Dept.
- Israel's new Lavy fighter, now in the design stage.
- The proposed new Saab-Scania AB fighter that is being planned to replace Sweden's Viggen.

In all three cases, companies are already looking at the so-called PW-1120 engine in competition with GE's 16,000-lb.-thrust F-404 engine, Pratt & Whitney spokesmen say. And the cost of the PW-1120 presumably would be less because it will adopt more than 60% of the components now used in the Pratt & Whitney F-100 engine that now powers both the F-14 and F-15 fighters. "That reduces the cost significantly," says a Pratt & Whitney spokesman.

Target: 1985. In addition to its lower purchase price, the PW-1120 engine should offer fuel economies, its supporters say. It could be in full production by 1985. And by then, says Frank W. McAbee Jr., president of Pratt & Whitney's Government Products Div. in West Palm Beach, Fla., the PW-1120 will get another boost because the F-100 engine, on which it is based, will have amassed about 3 million hours of service, thereby providing "a high degree of confidence in its design."

"From a technical standpoint, this is a low-risk development program," claims McAbee. If it also turns out to be a low-cost program, the combination will be hard to match.

ry Harold Brown, Navy Secretary Edward Hidalgo acknowledged that the Navy will have a tough time affording all the F-18s it wants. But he is reluctant to abandon the program. And, officially, the Defense Dept. feels that way, too. "Even if the Navy wanted out of the F-18, Brown wouldn't allow it," says one official. "We don't see a reasonable alternative to the plane, and we don't want to start all over with a new one."

Pressure on behalf of the F-18 is coming from the State Dept. Canada has ordered 137 of the planes for $2 billion, and both Australia and Spain are considering buying it. All such deals would be off if the U. S. canceled.

Political impact. There would also be an uproar in Congress if the Administration suddenly decided the F-18 should be terminated. In their military authorization bills for fiscal 1981, the House and Senate voted money to buy 72 and 60 F-18s, respectively. The Pentagon had requested funds for only 48. It is not insignificant that the F-18's engines will be produced in the Massachusetts district of House Speaker Thomas P. O'Neill, observes one Administration watcher. "O'Neill's goodwill is very important to the President."

With such forces arrayed against it, there is not much chance that the OMB's attack on the escalating cost of the F-18 will come to much this year. "But the issue of whether to continue the program won't go away," concedes one Administration source. Grumman Corp., manufacturer of the F-14, one alternative to the F-18 as well as Vought Corp., which makes the A-7, another possible substitute, can be counted on to keep the turmoil going, especially if the F-18's price continues to climb.

And there is not much question that it will. "The really bad inflation of the first half of 1980 is just now catching up with the F-18," admits the Administration spokesman. "Costs will get worse before they get better." ■

WORLD TRADE

A new French rush to California wineries

Seeking a toehold in the fast-growing U. S. markets for better-quality table and sparkling wines, French vintners are plowing capital into California at a startling pace. At the same time, they are helping to make California wines respectable in Europe, and U. S. wine sales there—especially in Britain—are rising at a fast clip.

So far, about $125 million of overseas money has been invested in California wineries. "I've never seen anything approaching the number of inquiries or the intensity of interest," says Louis R. Gomberg, a San Francisco wine consultant. "I'd call it a frenzied search."

Foreign investment has been growing in California vineyards for several years, but it is the arrival of the old-line vintners that is causing a stir now. On July 2, for example, Piper Heidsieck, a 195-year-old champagne producer from Reims, unveiled a $6 million joint venture with Sonoma Vineyards of Windsor, Calif., and its New York-based majority owner, Renfield Importers, to produce a "Piper-Sonoma" sparkling wine. In April, Société Baron Philippe de Rothschild, the largest seller of Bordeaux wines in the U. S., joined in a venture with Robert Mondavi of Oakville, Calif., to make "world-class wines in California."

Sonoma's Kwit: The deal brings Old World knowhow and French capital to U. S. winemaking.

Moet Hennessey, another French champagne maker, invested $20 million in 1972 in a Napa Valley winery, and it is spending another $3 million to double sales of its Domaine Chandon sparkling wine to 3 million bottles a year. "We are surprised to see how well our wines are received in the United States without any advertising or publicity," says Philippe Guerin, financial director.

Credibility. Other French vintners, beset by chronic shortages of top-quality grapes and stiff price competition in the U. S. from Italian imports, are also seeking access to California grapes. For the Californians, they supply sorely needed capital to small and midsize wineries, but the prestige of the French names is perhaps more important. "It puts the stamp of credibility on our industry," says Sam J. Sebastiani, president of Sebastiani Vineyards.

The arrangement between Piper Heidsieck and Rothschild and their U. S. partners is that the French will supply capital and Old World knowhow and that the U. S. partners will be in charge of growing grapes and making wine. "For a French company to come in and lay out a lot of money with American management in charge is something I can't imagine happening five years ago," says Kenneth J. Kwit, chairman and president of Sonoma Vineyards.

Even without foreign help, California producers are making inroads into table-wine markets abroad. "In the last year and a half the whole U. S. wine industry has raised its head up from a myopic concentration on the domestic market and is looking overseas," says Phil A. Letarte, an economist for the Agriculture Dept.'s Foreign Agricultural Service. This change in attitude, coupled with the depreciation of the dollar relative to other currencies, helped push U. S. wine exports to 5.2 million gal., worth $18.6 million, in 1979, more than double 1978.

Room for export growth. Canada accounted for roughly 60% of exports, but sales of California wine are increasing elsewhere. Exports to Britain, the largest European importer of California wines, jumped by 173% to 82,000 gal. in 1979, as wine dealers, hotels, and big retail chains such as Peter Dominic added or expanded California wine listings.

With exports accounting for only 2% of total California wine shipments, plenty of room for growth remains, however. As the accelerating entry of foreign investments heats up competition for the U. S. wine market, California producers will feel increasing pressure to retaliate. "The industry's focus will have to shift from production to marketing," says Sebastiani, who expects his winery to increase its exports to 1 million cases by 1985, a third of current production, from a projected 30,000 cases this year. "There will be disruption for a while and then a shakeout as we make the transition." ■

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In business this week

PEOPLE

A veteran succeeds

Standard Oil Co. (Ohio) has tapped its senior vice-president of technology and chemicals, John R. Miller, 42, to

Miller: Sohio's president.

become president and chief operating officer, effective on Aug. 1. The 20-year Sohio veteran succeeds Joseph D. Harnett, 62, who is retiring. A chemical engineer, Miller has held a variety of positions at the nation's 13th-largest oil company, ranging from transportation to finance. Cleveland-based Sohio, which is 53% owned by British Petroleum Co., last year netted nearly $1.2 billion on sales of $7.9 billion.

Superior Oil's new chief

After 17 years as chief executive at Superior Oil Co., Howard B. Keck, 66, is retiring and turning the reins over to his protege, President Joseph E. Reid, 51. Reid, a former Shell Oil Co. executive, is expected to continue the management direction initiated by Keck, who in recent years has recruited a team of oil exploration and development experts highly regarded by the industry. The company's 1979 earnings—$200 million, or $9.52 per share, on sales of $1.1 billion—make Superior a top money-maker among independent oil companies.

A Canadian paper strike

With strikes at Abitibi-Price Inc.'s eight Canadian newsprint mills scheduled to be in effect by July 5, the Canadian Paperworkers Union (CPU) is planning to revive dormant negotiations with other eastern Canadian producers who supply 55% of U.S. consumption. The CPU suspended those negotiations in hopes of reaching a pace-setting agreement with Abitibi-Price, holder of 10% of the U.S. market. A union spokesman says the differences that stalled the Abitibi-Price talks could spread.

FINANCE

Braniff's stalled stock

Braniff Airways Inc. has received a double jolt: $65 million of a previously announced $100 million private placement of preferred stock has come unraveled. Without that money Braniff could be blocked from tapping $220 million in unused revolving bank credits because of restrictions in its loan covenants. In a terse statement, Braniff noted that it could not sell $50 million in preferred stock this June and an additional $15 million as scheduled in January, "because certain earnings requirements under [its] private placement agreement had not been met." Braniff lost $44.3 million last year and $22 million in this year's first quarter. Analysts think Braniff may be forced to delay or cancel the purchase of jet aircraft that it has ordered from Boeing Co.

Chasing after Pullman

J. Ray McDermott & Co., the New Orleans offshore oil platform and utility construction company, is moving to buy a 22.5% stake in Pullman Inc., the financially troubled rail car manufacturer and construction contractor. On June 30, McDermott, which netted $88 million on sales of $3.3 billion in the fiscal year ended Mar. 31, announced an offer of $28 per share for up to 2 million shares of Pullman. Earnings at Chicago-based Pullman dropped 25% last year to $48 million, on sales of $3.2 billion. McDermott already owns 500,000, or 4.5%, of the Pullman shares outstanding. Speculators immediately bid Pullman's stock up past $31 on rumors that McDermott would pay a higher price. McDermott has about $525 million in cash and short-term securities.

Bailing out AMC

American Motors Corp. has restructured its revolving credit agreements to avoid defaulting on $90 million in loans. The loans are part of a $150 million revolving credit agreement AMC negotiated six months ago with 13 banks. Those banks froze their loans at the $90 million now outstanding when AMC said it expects record losses for the quarter just ended and for the fiscal year ending Sept. 30. AMC has until Oct. 31 to work out a new program. Until then, the financial subsidiary of AMC's French partner, Regie Nationale des Usines Renault, will extend $90 million in credit to the U. S. auto maker.

COMPANIES

Gould shifts gears

Gould Inc., in a move designed to "reallocate corporate resources" to its mainstay electrical equipment and electronics business, is phasing out a fast-growing financial subsidiary with about $196 million worth of leases and receivables. Gould has invested about $27 million in Gould Financial Inc., and the subsidiary's debt has soared 194%, to $99.7 million, since 1978, putting an additional burden on Gould's increasingly leveraged balance sheet. Gould also announced plans to acquire SRL Medical Inc., a leading manufacturer of pulmonary diagnostic equipment that becomes part of Gould's electronics group, for $10.3 million in common stock.

Gillette sues Scripto

Gillette Co., which introduced the first erasable-ink pen nearly 18 months ago through its Paper Mate division, has filed a patent-infringement suit against Atlanta-based Scripto Inc., which brought out a similar pen last April. The complaint, filed in U. S. District Court in Boston, asserts that three former Gillette employees hired by Scripto broke contractual agreements with their ex-employer by divulging trade secrets and confidential information enabling Scripto to make its pen. R. Douglas Martin, president of Scripto and an accused former Gillette insider, denied the charges.

A yen for Pepsi

"They offered us the most money," says Jack P. Jordan, president of Pepcom Industries Inc., explaining why his soft-drink bottling company has tentatively agreed to merge into Suntory International, the U. S. subsidiary of Japan's Suntory Ltd. Suntory is offering $38 per share or a total of $100 million for Pepcom. With 10 Pepsi bottling plants and eight distribution centers in New York and North Carolina, the company last year netted $6.4 million on sales of $69.6 million. In contrast, Suntory's U. S. subsidiary last year generated revenues of $20 million, mostly through distribution of Suntory beer and liquor. The parent company is the world's fourth-largest liquor distributor and also has interests in wine and soft drinks.

A truck from Europe

Through its IVECO Trucks of North America Inc. subsidiary, IVECO of Amsterdam hopes to crack the U. S. light-duty truck market with a diesel-powered van called the Z-100. IVECO, which is controlled by Fiat, plans to ship about 1,500 of its European-made trucks to the U. S. this year. The company claims that the trucks, which have 100-hp. air-cooled engines, will be twice as fuel-efficient as similar gasoline-powered models and will require only half the maintenance. IVECO already has orders for 250 of the vans from Federal Express Corp. and expects additional orders from bakeries, laundries, and other commercial users. ■

How to create jobs when a plant closes

When British Steel Corp. closed its Clyde iron works near Glasgow two years ago, both the antiquated factory and the jobs of its 800 employees seemed headed for the scrap heap. But instead of demolishing the plant, the state-owned steelmaker, at the suggestion of a new BSC subsidiary, spent $600,000 to remodel it into an enclosed industrial park that now houses 63 new businesses ranging from whisky barrel manufacturers to furniture makers. In the process, BSC achieved its primary purpose—creating jobs for 450 employees, about half of them former steelworkers.

The Clyde center is among the first in a small but growing number of experiments in Western Europe and the United States to deal with social upheavals caused by plant closings. Following an idea originated by the Swedish government in the mid-1970s, companies in Britain, France, Italy, and Spain already are trying a series of new measures to create jobs for workers they are laying off. These include offering plant sites, practical advice, and business knowhow to new and expanding companies that hire discarded workers, plus helping to arrange financing, either through banks or with direct equity stakes. In 1980 alone, British Steel will create jobs for up to 10,000 of the 52,000 workers it plans to furlough by the end of this year. "It's fantastic," says 57-year-old W. L. Williams, a laid-off, 40-year BSC veteran who now works at a new sheet metal fabricating plant in South Wales. He adds, "At my age, it is doubtful I would have found a job otherwise."

Restrictions. To mitigate the harmful effects of plant closings, Japan and many European nations place more restrictions on employer mobility than does the U. S. Japanese workers are virtually guaranteed lifetime employment. In Western Europe, laws require advance notice of closings, retraining for displaced workers, and hefty severance payments. In France and West Germany, companies have to consult with union and government officials before shutting down plants.

But even these methods are proving insufficient for coping with major plant closings, and this has led to the birth of industrial regeneration plans. "In the last several years, there has been a growing awareness of the responsibility and duty of the employer to the individual that he renders jobless, and today's economic climate has made the responsibility greater," says John Reed, personnel director for Reed International Ltd., a paper and publishing company. Moreover, says P. G. Naylor, a consultant who lines up host companies with entrepreneurs, social pressures against closings often cause companies to make costly delays in announcing layoffs. "If alternative employment can be attracted to a community, industries can shed unwanted labor months and years ahead of what would otherwise be possible," Naylor says. This is why British Steel, until recently, has been able to lay off many workers quickly without union resistance and why, despite huge financial losses, it is spending $45 million to create new jobs.

Consultant Naylor: "You can't . . . just walk away" after massive layoffs.

The idea began on a major scale two years ago when BSC hired Naylor to run a subsidiary called BSC Industry Ltd., which seeks out entrepreneurs or existing companies in need of workers. BSCI advertised in newspapers, and one of the early replies came from a ceramic tile importer named Geoffrey G. Cook, who wanted to start up his own tile factory. "He had $225,000, and he needed $4.5 million," says Naylor, who has since left BSC to start his own consulting firm. But more important, perhaps, he had a credibility gap—he had never manufactured anything.

Influencing the bankers. BSCI hired a consultant to flesh out Cook's idea and make it more manageable. The company also helped him find a site in South Wales, where BSC is shedding workers, and it showed him how to win government development grants. Cook, whose plant is now starting up, is aiming for an annual sales rate of $6.5 million by year-end and 100 employees by mid-1981. He plans to add 66 workers if the company prospers. The project "wouldn't have gotten off the ground in the same form without BSCI," says Cook. "The fact that they supported it gave us credibility that influenced the bankers and the Welsh Development Office."

BSCI has also helped healthy companies expand. Fereligh Ltd. had one sheet

Fereligh's Bradford (right) expanded his company with the help of BSC Industry.

Aluminum radiators catch on

The lighter metal grabs another car part, with GM leading the switch

U. S. auto makers are willing to try almost anything to trim the weight of cars and boost fuel economy. Saving even a pound or two is crucial as the industry strains to meet the federal mandate for 30% improvement in average miles-per-gallon ratings by 1983. That is why Detroit, led by General Motors Corp., is taking a cue from foreign carmakers and resurrecting a 30-year-old idea: aluminum radiators. By tossing out heavy copper units in favor of the lighter metal, GM figures to chop 10 lb. from its cars virtually overnight.

GM's move has aluminum producers hopping with glee—and many current suppliers of copper radiators scrounging to find ways to cut the weight of their products. Aluminum suppliers, noting that their metal now costs about 25% less per pound than the copper and brass used in conventional radiators, eagerly predict they will capture half the U. S. car radiator market by 1985. And Thomas D. Pitzer, assistant development manager for automotive applications at Kaiser Aluminum & Chemical Sales Inc., adds that a wholesale shift to aluminum for car radiators would create a yearly market for 60 million to 80 million lb. of the metal in the U. S. alone.

Thin fins. However, the copper industry is not about to abandon a market that accounts for almost 30% of its passenger-car business and 2.2% of total U. S. copper sales. Gränges Metallverken, a Swedish company that is a major supplier of copper to the automotive market, has pioneered a technique for making a radiator's so-called fins from very thin copper. The fins are corrugated strips attached to the top and bottom of a radiator's tubes and serve as the chief heat-exchange surface between air flowing over the tubes and the fluid inside. Gränges believes its thinner fins will reduce aluminum's weight advantage to 3 lb. or less.

Many producers of copper radiators hope that Gränges is right, because the thin-fin approach would protect their investments in capital equipment. "We are not going to just give up and run," declares Joseph E. Terpak, president of Fedders Corp.'s Automotive Components Co., a major builder of copper radiators. His company is working closely with Global Metals Corp., the U. S. representative of Gränges.

Brazed joints. Many independent radiator builders are hesitant to switch to aluminum because they worry that Detroit may be up to its old tricks of playing off one group of suppliers against another. Thus they are reluctant to install the costly vacuum-brazing furnaces that will be essential to make aluminum radiators to Detroit's specifications. To assure structural integrity, auto makers insist that all aluminum-to-aluminum joints be brazed. This means that the assembled radiators must be heated until adjacent surfaces flow and fuse, and the equipment for this is up to five times as expensive as the soldering equipment used to make copper radiators. Radiator makers estimate that it will cost as much as $250 million to install sufficient

Robert L. Smith

GM's Walsh: Producing aluminum units for 1980 cars.

capacity to turn out the 10 million units that Detroit needs annually.

But aluminum's advocates think that copper's efforts to hold onto its market in radiators will be in vain. By 1985, they point out, even a 2-lb. or 3-lb. difference will be significant to carmakers as the mandatory corporate average fuel economy climbs from today's 20 mpg to 27.5 mpg. Certain cars, asserts Michael K. Walsh, general sales manager at GM's Harrison Radiator Div., "will mandate aluminum because of weight considerations."

Turnaround. Aluminum's new respectability in radiators represents quite a turnaround for Detroit. For decades auto makers purposely shunned the light metal because antifreeze compounds tended to encourage corrosion; also, repairing aluminum radiators can be tricky, and repair shops encountered big problems with the auto makers' earlier experiments. But in recent years, as growing numbers of engine parts have been converted from iron to aluminum, coolants that are "friendly" to aluminum have come along. And Harrison Radiator is now offering a blowtorch repair method for aluminum radiators that is familiar to repairmen accustomed to torch-and-solder tools.

The GM division is building aluminum radiators for 50,000 full-size GM cars this year, and it will double that volume next year. That is a mere fraction of the Lockport (N. Y.) operation's capacity—it supplies radiators for virtually all GM cars—but the No. 1 auto maker appears committed to a future of more aluminum. In 1983, GM wants Harrison Radiator to turn out 500,000 aluminum radiators. And in Europe Harrison Radiator is converting enough capacity to build 300,000 vacuum-brazed models by the end of next year. The accelerated schedule is partly a reaction to the fact that many foreign carmakers already use aluminum radiators in large volumes.

Neither Ford Motor Co. nor Chrysler Corp. is moving as fast to aluminum radiators. In Chrysler's case, the holdup is the company's total reliance on outside radiator vendors. Ford, like GM, builds most of its own units and probably will switch as the need to reduce weight becomes more crucial, but for now the move has been deferred by its recent financial woes. Still, the eventual switchover to aluminum radiators seems to be almost unstoppable. "It doesn't really make any difference what part of the world the vehicle manufacturer is in," observes Harrison's Walsh. "If someone comes in and says, 'I can do this job with equal quality and reliability, but less weight'—that's like motherhood and apple pie." ■

New Zealand's plan to turn gas into gasoline

The plight of the Ancient Mariner may be appreciated most in New Zealand. Although the country has energy everywhere, in the form of geothermal wells, hydropower, natural gas, and coal, it has not a drop of oil with which to quench its thirst for gasoline. Oil—all of it imported—accounts for 46% of the country's total energy consumption. "We don't have an energy crisis at all," laments W. A. Poole, research director of the New Zealand Employers Federation. "We have a liquid fuels crisis."

That in itself does not make New Zealand unique. But unlike most countries heavily dependent on imported oil, New Zealand is taking steps that will significantly reduce its reliance on outside oil. By converting its natural gas to liquid fuels or substitutes for them, New Zealand plans to cut its oil imports in half by 1985.

The centerpiece of the program is a process developed by Mobil Oil Corp. to convert methanol to gasoline. Next month, New Zealand and Mobil are expected to sign the final agreement to build a $500 million plant near New Plymouth that will take 140 million cu. ft. per day of natural gas from the Maui field and convert it, first to methanol and then to 12,000 bbl. per day of gasoline. When completed in 1985, the plant will supply about one-third of New Zealand's gasoline needs.

First commercial use. This will be the first commercial application of the Mobil process, developed in the mid 1970s with the idea of using methanol derived from coal. In the U. S., Mobil estimates, the process could produce gasoline from coal for about 50¢ per gal. more than current prices. The origin of the methanol, however, makes no difference.

The New Zealand government believes that by the time the plant is finished, the gasoline it will deliver will be cheaper than gasoline derived from imported oil. Even more important is the government's desire to achieve quickly a substantial degree of energy independence. "It's very much in our interest to become energy self-sufficient," points out Energy Minister William F. Birch, who emphatically adds: "And we will achieve it through proper utilization of our gas."

No one disagrees with the idea of energy independence, but there is wide disagreement over whether converting natural gas to gasoline will, in fact, make the best use of New Zealand's gas. Instead, some critics say, the gas—nearly all of which will come from the Maui field—would best be exported as liquefied natural gas (LNG). The earnings from these exports, say the critics, would more than offset the cost of imported oil and at the same time permit the development of other alternative fuels.

Until recently, the government had expected to export LNG. It had nearly approved a proposal made in 1979 by

Shell Oil (N. Z.) Ltd., a subsidiary of Royal Dutch/Shell Group, to ship 410 million cu. ft. a day of LNG from the Maui field. According to Shell, the export earnings from that operation would have been 30% greater than the country's present oil bill of $1.4 billion a year. But early last year New Zealand decided to use the gas to replace imported oil.

Lacking oil, the country looks to a Mobil process for making liquid fuels

"They changed course on Maui when we were pretty well across the river, not just downstream," complains David Tudhope, the chairman of Maui Development Ltd., a partnership of Shell, British Petroleum, Todd Petroleum Mining, a New Zealand company, and the island government.

A soft market. For its part, the government now says that the LNG plan would have depleted the Maui field too quickly, at too low a price. Because the world market for LNG is soft these days, the country would have had to sell it for less than a premium price. New Zealand would also have been at a disadvantage because it is farther away from the big LNG market in Japan than other producers, such as Indonesia.

The squabbling over how best to use Maui's gas has gone on almost from the time the field was discovered in 1969. With a population of only 3 million and plenty of nonoil forms of energy, New Zealand felt little pressure to tap the field. As a result, the first gas began to flow from Maui only last year. But since the quadrupling of oil prices and mounting concern about the security of supplies, development has quickened. "The government has decided to use most of Maui for import replacement," explains Leonard C. Bayliss, chief economist for the Bank of New Zealand.

Present plans are to use about 25% of the field's projected production of 560 million cu. ft. a day in 1985 to produce gasoline via the Mobil process. Because this will be the first commercial use of the process, the government is hedging its bets. It will use a further 25% of the field's output to produce compressed natural gas and liquid petroleum gas, some of which may be used to replace gasoline. The remainder of the Maui gas will be converted into methanol, and most of this will either be exported or used in a new petrochemical complex being considered. Some methanol also may be blended with gasoline to make gasohol—or used directly as methanol in specially modified cars.

Compatible. Indeed, until it decided late last year to use the Mobil process, the government had explored the possibility of converting most of the country's automobiles to use pure methanol. "Methanol is a fine fuel, but there's a distribution problem unless all cars in the country are designed to use it or are converted for it overnight," says Joe E. Penick, senior vice-president of Mobil. "The advantage of our process is that for a small additional cost, it can produce a fuel compatible with today's cars."

Nevertheless, New Zealand is still keeping its options open. In addition to its continuing experiments with methanol, it plans to convert 140,000 vehicles—16% of those on the road—to use compressed natural gas.

If the Mobil process is successful, however, New Zealand is likely to meet most of its gasoline needs with it. Moreover, it could point the way for other countries. "We've had numerous inquiries," says Penick. "It could work very well in countries that have to import a lot of oil and have natural gas, but not in quantities large enough to support a really big LNG operation." ∎


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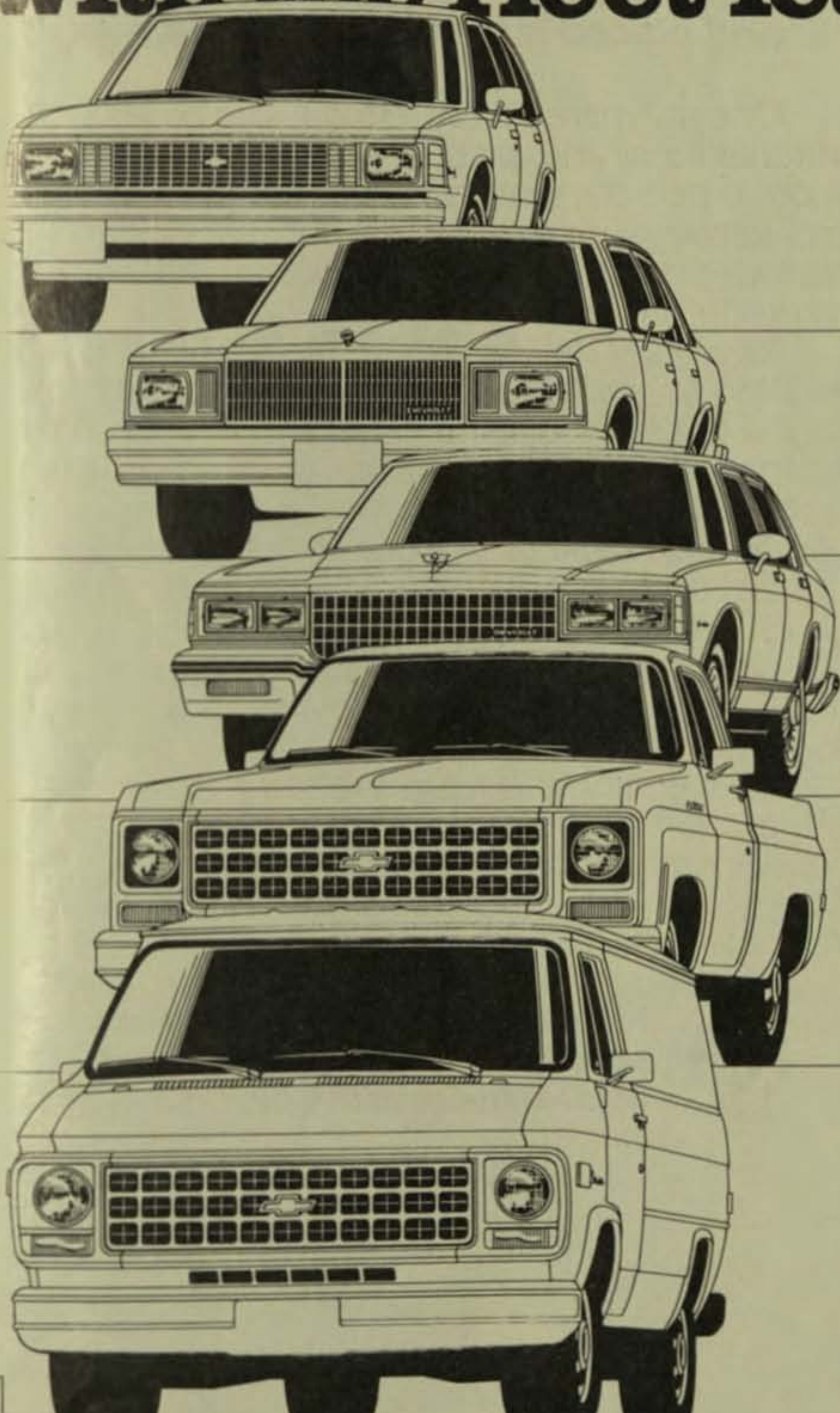

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POLAND

A desperate quest for Western money

For the first time since the Russians invaded Afghanistan in December, U. S. banks are leading foreign banks in a major loan to an East bloc nation—Poland. At a July 3 meeting in London, the moneymen were to act on a Polish request for $500 million. But a sharp split among the bankers on political issues surrounding the controversial loan may delay the credit package until the fall. By that time, however, a major credit crunch will be shaping up, as Brazil, South Korea, and most other developing countries that import oil run out of their fast-depleting reserves. A number of them will then rush back to the international banks for cash—making the handing over of $500 million to Poland even more painful.

Poland is in desperate need of the new credits to meet interest and amortization payments on its enormous foreign debts—totaling nearly $20 billion—at a time when its economy is suffering from slow growth, a bad harvest, and official mismanagement. With oil prices going up and export markets sure to shrink as Europe enters a recession in the months ahead, Poland will be forced to default on this debt to Western banks if it does not get the new cash before next winter. And that could bring the entire debt pyramid of all oil-importing countries crashing down.

The bankers are attempting to get Poland to impose harsh economic restraints in exchange for this badly needed balance-of-payments financing. Behind the split among them is the worry that this effort may be undermined by cheap loans from France and other European governments that want to increase their exports to the Poles. The more conservative lenders argue that unless there is a unified bargaining position among governments regarding trade and credit to Poland, it is senseless for private banks to proceed.

The French, in particular, worry the bankers. A few months ago, France suddenly put government pressure on its banks to give new loans to Poland without consulting anyone—in effect, rescheduling some of the old debt. Now bankers worry that France, Britain, and Germany may offer additional soft loans or further debt reschedulings in the months ahead. (Britain is a large creditor to Poland through its own export-import bank; Germany is Poland's largest trading partner.) During the visit of the French Foreign Trade Minister to Poland in May, a communique was issued saying the financing of exports of consumer capital and semi-manufactured goods is covered by "protocols offering privileged terms."

Quiet diversion. Poland's ace-in-the-hole, of course, is coal. Right now the Poles are negotiating separately a $500 million loan from the Germans, and specific guarantees of coal deliveries are a big part of the deal. Also, coal accounts for 60% of Poland's exports to France. In fact, a recent report on the Polish economy by a committee of the French National Assembly deliberately downplayed Poland's current debt problems by saying: "Even if certain international experts are warning Western countries against the heavy indebtedness of Poland and insist on the fact that this country is spending half its foreign exchange receipts on debt service, it has to be remembered that . . . its energy resources constitute a guarantee."

That coal guarantee may be all that saves Poland. In May, Moscow quietly allowed the Poles to divert coal exports from Russia to the West to raise hard currency to pay off maturing loans. Poland is not a member of the International Monetary Fund or the World Bank and could not fall back on these institutions in an emergency. A key question is whether Moscow would bail Poland out. So far the Soviet Union has not provided any significant credits to Poland, although Warsaw may be getting some funds from Comecon banks. ▪

Hauling Polish coal: France downplays Warsaw's debts by calling Poland's energy reserves a repayment guarantee.

BRITAIN

Shell's gas find could keep profits zooming

"We will overtake Exxon [in gas]," claims Malcolm W. H. Peebles, director of planning and finance for Shell International Gas Ltd., a subsidiary of the Royal Dutch/Shell Group. Now the world's second largest nongovernmental gas-producing company, the group is participating in a rash of projects to become No. 1. Peebles hopes that Shell will do so by 1984 or 1985, and a recent

INTERNATIONAL BUSINESS

gas discovery in the North Sea, apparently containing up to 42 trillion cu. ft., could bolster its chances.

Shell's 1979 profits of $6.8 billion are the highest among the world's nongovernmental companies, and its international gas trading operations, which contributed one-third of those earnings, seem likely to grow dramatically.

Supplies of crude. Shell has also been working to shore up its crude-oil position. Traditionally the most crude-short of the majors, Shell diversified its exploration effort and began buying crude on long-term contract and on the spot market more than a decade ago.

Today all the major oil companies are crude-short. Even the Arabian-American Oil Co. partners (Exxon, Texaco, Standard Oil of California, and Mobil), which get the great bulk of Saudi Arabia's 9.5 million bbl. of daily production, are not sure of getting all their needs. All are forced to follow Shell's long-established strategy of buying additional crude on the open market and of investing to upgrade their refineries and make each barrel more profitable.

True, as long as the Saudis hold their prices below those set by other members of the Organization of Petroleum Exporting Countries, the Aramco partners still have an edge on Shell. But Shell's early investment in thermal and catalytic cracking plants, which reprocess most of the heavy residual fuel oil left by ordinary refining into light products such as gasoline, can recoup as much as $2 per bbl., say industry sources.

As a result, Shell's sales of low-profit heavy fuel oil as a share of its total sales of refined products have dropped from 32.6% in 1970 to 23% in 1979. At the same time, its more profitable gasoline sales increased from 27.2% to 33%.

Less vulnerable. Indeed, Shell has overcome its disadvantages so well that such analysts as John Shaughnessy of Oppenheimer & Co. see it as among "the best-managed of all the oil companies." Over the years, says Shaughnessy, "they have replaced low-profit oil with high-profit oil and gas." Industry observers note, moreover, that Shell's underlying earnings growth is coming mainly from production rather than refining and marketing, and that Shell's diversity of supply—it gets no more than 10% of its crude from any single country—makes it less vulnerable than many competitors. Three-quarters of Shell's oil reserves of 7.2 billion bbl. are located outside OPEC, and production from areas such as the North Sea is expected to increase.

Even if oil prices were to remain unchanged, John V. Thompson, an analyst with London stockbrokers Fielding, Newson-Smith & Co., expects Shell's oil production profits to more than double by 1984. He predicts the same performance from Shell's booming gas business as international gas prices edge toward parity with oil. ■

Debenhams retreats from diversification


Thornton: Hoping in-store boutiques will raise Debenhams' profitability.

To reverse a four-year slide in its profitability, Debenhams—the $1.3 billion-a-year British department store chain—is renting out large quantities of its floor space to specialized concessionaires while holding a "clearance sale" of some specialized businesses of its own. The chain's retreat from diversification represents a 180° reversal of the strategy it adopted eight years ago after resisting a takeover bid. At the annual shareholders' meeting on July 17, Robert C. Thornton, Debenhams' chief executive, will announce earnings of only $35.9 million for fiscal 1979. The past policy—diversifying into retailing ventures (from supermarkets to high fashion)—has brought the company's profit margin down to 2.7% from 7.4% in 1975. It has also pushed Debenhams' stock so low that some analysts believe it may once again become a takeover target.

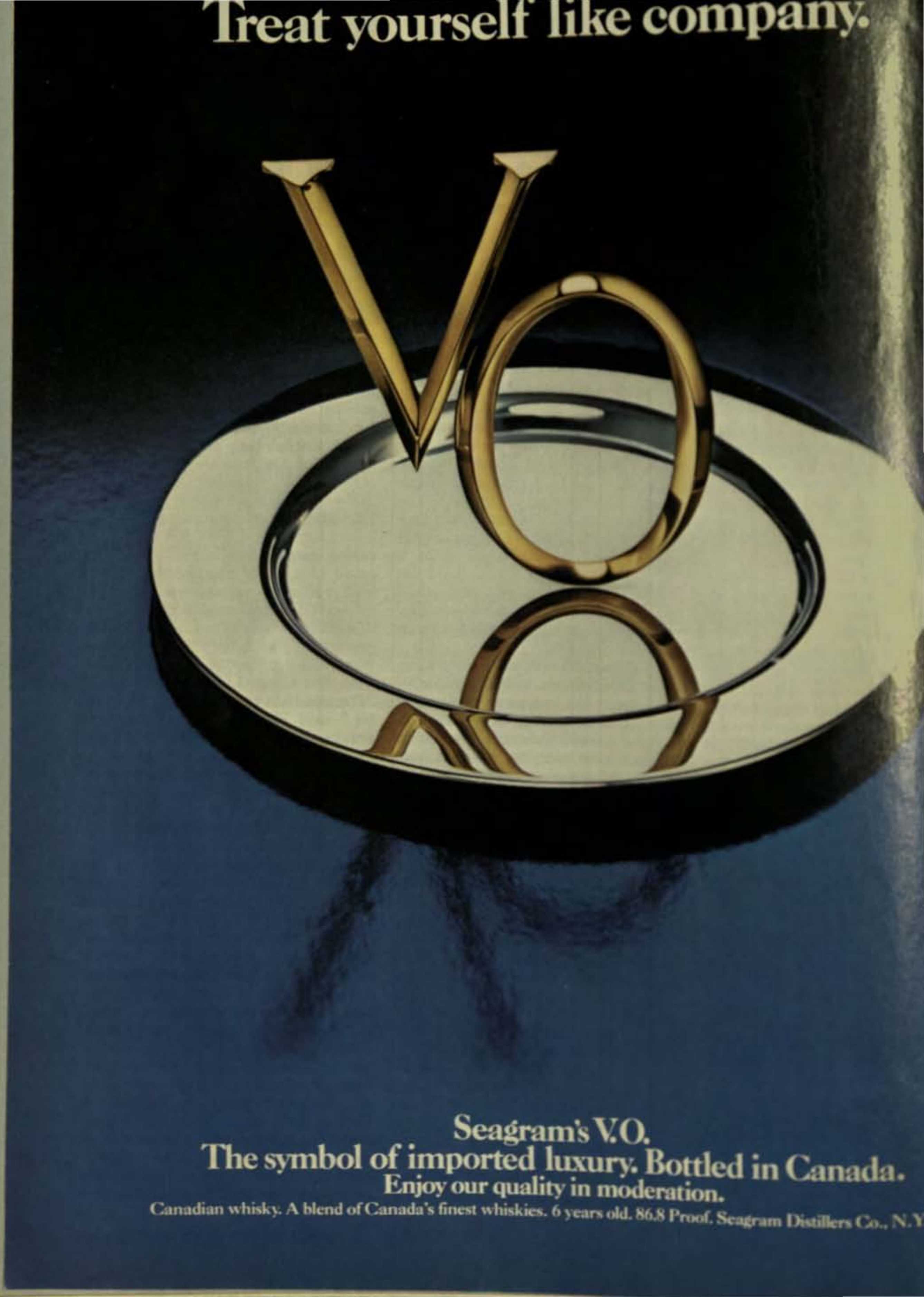
Meanwhile, Debenhams is reshaping its policies to take advantage of ideas that are paying off. The "shops in shops"—spaces that the chain rents to such concessionaires as Mary Quant cosmetics and Windsmoor ladies' fashions—occupy less than 20% of the selling space in its 74 stores but contribute more than 25% of its profits. By the mid-1980s, Debenhams officials say, these boutiques could occupy as much as 50% of the space in the company's stores. Among the possible new tenants: doctors, pharmacists, solicitors, and building societies (the equivalent of U. S. savings and loan associations). Says Kenneth G. Bishop, Debenhams' managing director of finance: "We want to create a space where a family can shop, save, eat, and spend all day."

The company is also cutting its losses through the sale of peripheral businesses. In the past eight months, Debenhams has sold $44 million worth of these smaller businesses, including Caters supermarkets, Greens camera and hi-fi stores, English Lady and Cresta fashion shops, and the franchise operations of Hardy Amies, dressmaker to the Queen. Still on the block are 6 of 13 former New Dimension furniture stores that closed in January.

Falling margins. The sale of assets is a result of a major management session that produced the new corporate strategy last fall. Debenhams' original diversification into specialized retailing was prompted by an unfriendly takeover bid (worth $268 million, or $6.80 per share) from UDS Group Ltd., a rival retailer. "The idea then was for companies to get big," says Bishop, "and we sought to acquire the expertise for specialist items by buying other companies."

In the process, however, Debenhams' pretax profit margin slipped, and the decline has driven down the company's share price: It hit a three-year low of $1.35 last fall, and when the stock rose to $2.41 at yearend, this was mainly on the strength of rumors of another takeover bid. The price has since fallen to about $1.68; but the rumor mills are grinding, with analysts noting that Debenhams' assets alone are worth $4.56 a share. Late last year Thornton told financial analysts that he would give any bids consideration, but he added that Debenhams is likely to battle to remain independent.

Another move Debenhams is making to improve profitability is the setting up of a separate finance company, Welbeck Finance Ltd., to handle its credit card sales. The new company will remove the cost of financing such sales from Debenhams' income statement, reducing the store chain's interest expense. ■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International outlook

Edited by Sol W. Sanders

Tanaka still reigns as Japan's kingmaker

Former Prime Minister Tanaka: Playing a key role in choosing Ohira's successor.

Former Prime Minister Kakuei Tanaka, although elected to parliament as an independent and still under indictment for his alleged bribe-taking in the Lockheed affair, is nonetheless the kingmaker when it comes to naming the Japanese Liberal Democratic Party's new Prime Minister. Heartened by recent electoral successes and again wielding a comfortable majority in both houses, the LDP, Japan's conservative party, is to choose its new leader before a special Diet session that begins on July 17. The maneuvering will be muted until after the state funeral on July 9 of former Prime Minister Masayoshi Ohira.

Tanaka's influence is generally said to stem only from his ability to raise huge sums of money for political causes. But he is also an astute strategist. He outmaneuvered former Prime Minister Takeo Fukuda by using so-called party reforms to gain control of the LDP. And it was Tanaka's strategy two years ago that put Ohira into office. Furthermore, some Tokyo observers believe that Tanaka's "shock-troop commander," Home Minister Masaharu Gotoda, played an important role in tricking the unsuspecting opposition into the no-confidence vote that forced new elections and resulted in a startling LDP victory.

Next in line. The LDP seems to have halted—at least temporarily—the gradual erosion of its majority and Japan's inevitable progress toward coalition governments. And Tanaka can claim some of the credit for this.

It is assumed that Tanaka wants Yasuhiro Nakasone (BW—Dec. 31) as Prime Minister because he stuck by Ohira—and Tanaka—in the recent infighting. Nakasone, a 62-year-old former Cabinet member, is considered next in line. But there is opposition outside the LDP to his strong support of rearmament, and he is considered, even in the volatile world of Japanese politics, to be a political butterfly. Few U. S. officials know him well, and most think he is anti-American because of his flagrant Japanese nationalism.

One good reason for President Carter's going to Japan for the Ohira funeral ceremonies is to talk to Nakasone, whose strongest opposition is Toshio Komoto, a 69-year-old businessman turned politician who might get the support of the "Zaikai"—Japan's powerful business leadership. A compromise candidate could be Kiichi Miyazawa, an English-speaking reputed liberal who is close to many Americans. And it could just be that the difficult decision of choosing Ohira's successor will be postponed—with an interim choice—until the regular LDP congress in December. ■

Why Schmidt wants a minerals deal with the Soviets

Germany's anxiety over raw materials supply, similar to the insecurity that helped cause two world wars, was in the background at the meeting on June 30-July 1 between West German Chancellor Helmut Schmidt and Soviet President Leonid I. Brezhnev. Sensitive to bitter criticism in some U. S. quarters over the timing of his visit to Moscow, Schmidt is expected to let any commercial agreements drift for the moment, to be signed later at the ambassadorial rather than summit level. But Germany has almost no mineral resources, and Bonn's concern about the dependence of its industrial machine on foreign suppliers is growing. Among these, South Africa has become a principal provider, and the risk that it may be subjected to international sanctions makes it an uncertain source.

By turning to Moscow for energy (BW—July 7) and for minerals through resource development agreements, Germany is attempting to diversify its sources. But in spreading the risk, Schmidt runs another: He could find Moscow imposing constraints on German foreign policy by manipulating supplies. Bonn got a taste of that last winter when the Soviets, angered by Germany's leadership in NATO's December decision to deploy new intermediate-range missiles, cut off Germany's supplies of titanium sponge.

Dependence. The Germans, moreover, for years have privately expressed dissatisfaction with Soviet project and contract performance. But their dependence on foreign sources of minerals has become increasingly critical. That is why the Federal Republic is extending credits in the range of $100 million annually for mineral projects around the world—and why it is now contemplating a large stake in Russia's minerals-rich East. Bonn is 100% dependent on imports in aluminum, tungsten, nickel, titanium, molybdenum, vanadium, antimony, mercury, platinum, manganese, chromite, zirconium, asbestos, magnesite, and phosphate. It is 99.8% import-dependent in copper, 93% in iron, 87% in lead, and 68% in zinc.

Reflecting Bonn's unease, NATO has now called for a review of the European Community's dependence on minerals from southern Africa. Meanwhile, Germany has been stockpiling such critical ores as chromite, cobalt, and manganese. A shift to the Soviet Union as a principal supplier would reflect Bonn's uncertainty about developments in southern Africa and U. S. policy toward Pretoria.

Perhaps Schmidt is bargaining for Soviet "neutrality" in southern Africa. As long ago as 1977, Wolfgang Ulbrich, the foremost German specialist on minerals resource geopolitics, warned: "Europe cannot afford to allow third parties to upset the process of peaceful change which is about to start [in southern Africa]." If that was on the Chancellor's agenda, his Moscow talks indeed represented a new era of German resource diplomacy.

—**Daniel I. Fine**
Resources analyst

The hot new competition in science magazines

Time Inc.'s *Discover* joins the rush to exploit a growing interest in science

In 1977, when a *Time* cover on anthropologist Richard Leakey outsold flashier covers on rock star Linda Ronstadt and actress Diane Keaton, Time Inc. executives were not surprised. It merely confirmed something they had suspected for several years: The American public is fascinated with science. Time officials set to work to capture that market, and this fall will begin publishing *Discover*, a science magazine designed for the general public.

Unlike Time Inc.'s other magazines, including *Time*, *Sports Illustrated*, *People*, and *Money*, which were the first of their kind, *Discover* will be entering a field that is getting more crowded each day. Other publishers, including Hearst Corp., Bob Guccione, and the American Association for the Advancement of Science (AAAS), are pushing their own scientific publications aimed at the general reader. While no one questions the public's interest in science, many wonder whether that interest is strong enough or widespread enough to support so many new magazines. "There is certain to be some fallout," concedes one analyst.

Largest investment. Time officials, however, are betting heavily that *Discover* will not be among the casualties. While the company will not disclose how much it is spending on *Discover*, Publisher Reginald K. Brack Jr. admits it is the largest investment Time has ever made in a magazine. A large amount is being spent on television and print advertisements. "By next year, *Discover* will be a household word," predicts Brack.

For *Discover*'s first issue this October, Time is guaranteeing its advertisers a circulation of 400,000. Brack disputes the conventional wisdom that it is risky to launch a new magazine in a recession. He points out that most of Time Inc.'s publications, including its business magazine, *Fortune*, were started during economic hard times.

In many areas, *Discover* will borrow extensively from *Time*. *Discover*'s managing editor is Leon M. Jaroff, who, as a senior editor in charge of *Time*'s science sections, edited many of the cover stories—including the one on anthropologist Leakey—that sold well and won national journalism awards. According to Brack, Jaroff will bring with him the news magazine's technique of discussing difficult topics in terms that the average reader understands. While Jaroff's editorial staff currently numbers only 21, it will have access to Time's far-flung international bureaus.

Discover's major competition will undoubtedly come from *Science 80*, published by the prestigious AAAS, which also publishes the 100-year-old *Science* magazine. At present, *Science 80* is a bimonthly, but because the magazine caught on so quickly—its circulation soared to 400,000 after only four issues—it is expected to go monthly with its November issue. The AAAS also is negotiating with *Time*'s traditional competitor, *Newsweek*, to distribute an international edition of *Science 80*.

Editor Jaroff and Publisher Brack: Working with the biggest investment Time Inc. has ever made in a magazine.

The science giant. AAAS officials believe their product can withstand any challenge from Time Inc. "In publishing terms we are invisible, but in science terms we are a giant," says Allen L. Hammond, *Science 80*'s chief editor. Because of its ties to the AAAS, Hammond notes, *Science 80* has "the inside pipeline" to the scientific community.

While the AAAS will not be spending large sums to promote *Science 80*, the organization appears intent on protecting its investment in both its magazines. Last fall, the AAAS filed suit against Hearst Corp. charging that a redesigned edition of that company's *Science Digest* had infringed on a registered trademark of the AAAS, the cover logo of *Science* magazine. Hearst, in its efforts to revitalize the nearly 50-year-old *Science Digest*, made it a full-sized magazine (it had previously been about the size of *TV Guide*), and changed the cover logo to make the word "Science" larger and more prominent than the word "Digest." In April, the U. S. District Court for the District of Columbia ruled that Hearst must alter the logo in future editions.

But the outcome of the lawsuit has not diminished Hearst's hopes for *Science Digest*. According to Publisher Charles Mandell, the company has printed three test issues that sold an average of 180,000 copies of the 250,000 placed on newsstands. He says it has had no difficulty attracting advertisers, partly because of the Hearst reputation. "We think this magazine will end up with the largest circulation because it is broadest in its information base," he claims.

Facts. One of *Science Digest*'s strongest points, Mandell believes, is that it will contain no science fiction. "*Science Digest* deals in science fact, not fiction," he says. *Discover*'s editors are toying with the idea of including one or two science fiction pieces per issue.

One publisher who is making no excuses for including science fiction in his magazine, *Omni*, is Bob Guccione, the publisher of *Penthouse*. In fact, the line between science fact and fiction in *Omni* is at times so blurred that the reader may have difficulty determining where one ends and the other begins. Yet dur-

MEDIA & ADVERTISING

ing its two-year existence, *Omni's* formula has proved so successful that many experts believe it may have sparked the current proliferation of science magazines.

Firmly planted. According to Guccione, *Omni's* circulation now hovers at about 900,000, with approximately two-thirds of that coming from newsstand sales. "I don't see any existing or potential competitor as being a real threat to *Omni*," he says. "It's in a category of its own." Any competition for *Omni* may come from Guccione himself. He told BUSINESS WEEK that he plans to spin off two new magazines from *Omni*.

For *Discover*, an initial circulation of 400,000. Any science fiction?

Discover's Jaroff, however, is more cautious than Guccione about the competition. He believes he will be competing with most of the other science magazines. He also cites as competitors *Next*, a futuristic magazine published by Litton Industries Inc., *Focus*, a one-topic bimonthly being tested by *Newsweek*, which would sometimes deal with science subjects, and, because of *Discover's* emphasis on science news, *Science Times*, the special Tuesday section of *The New York Times*.

Possibly the only science magazine that may be truly insulated from this new competition is *Scientific American*, which has never been intended for the casual reader. "We are not offering passive entertainment," says Publisher Gerard Piel. "We cover the spectrum, but we don't shrink from the fields that are inherently difficult." Piel says that the magazine's present circulation of more than 700,000 in the U.S. and abroad is made up mostly of research scientists and engineers "who make the future happen."

The challenge. But Piel is fairly sanguine that the new magazines may succeed in an area where *Scientific American* has failed: explaining to the general public the value of science and scientific research. "This is essential to science in a democracy," says Piel. "If people are going to foot the bill, they have to know what they're buying."

Richard C. Atkinson, director of the National Science Foundation, observes that because science now finds it difficult to attract funding, the timing of these new magazines is perfect. Others agree that because the public wants to know more about science, there may be room for many different science publications. "We're all aware of how much science is affecting our lives," says J. Kendrick Noble, first vice-president at Paine Webber Mitchell Hutchins Inc. "This is not a passing fad." ∎

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VOLVO

BACK TO RAILROADING FOR A NEW ERA

After diversifying successfully into energy, Union Pacific sees growth and profit again in its original business

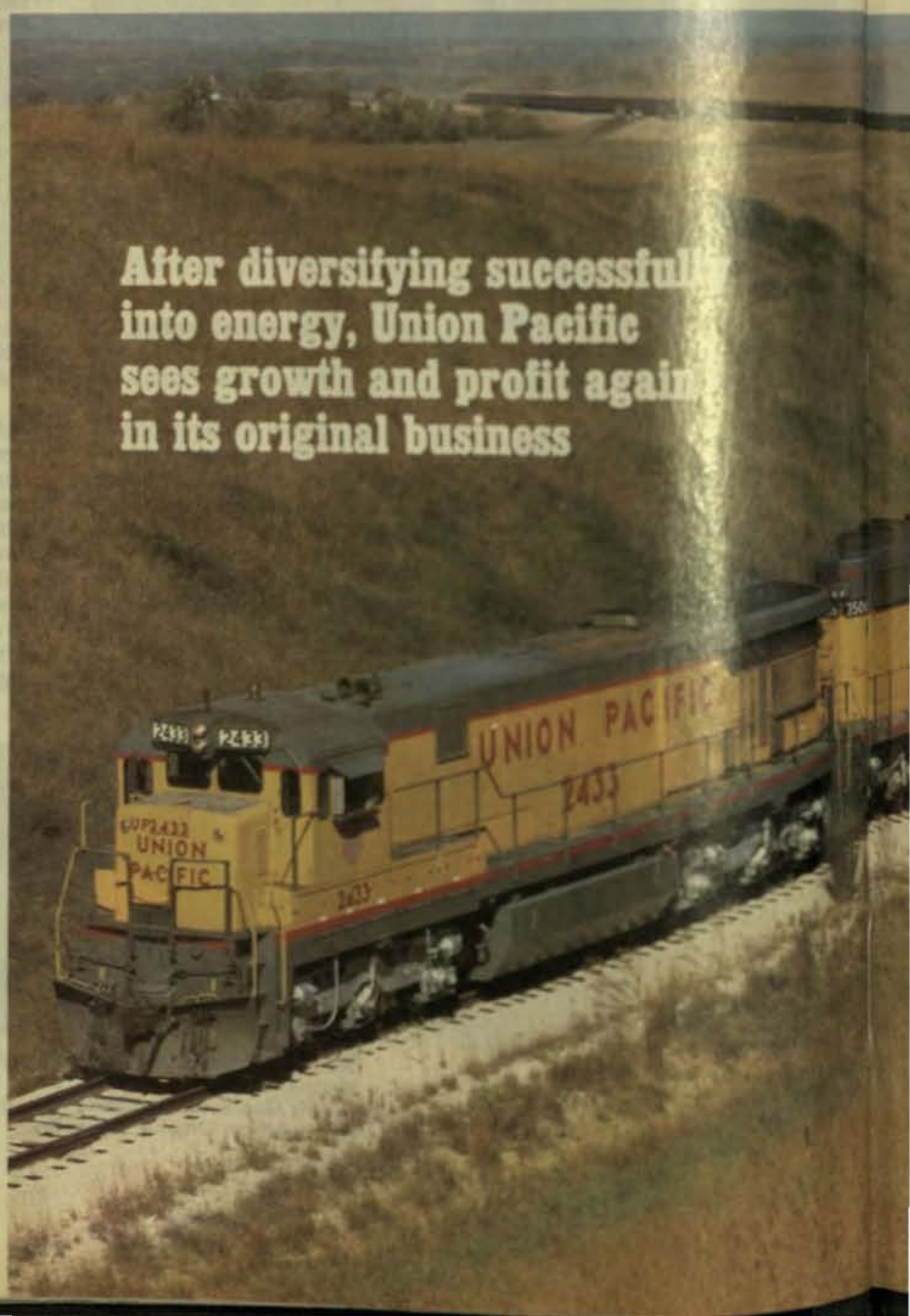
In an industry not known for aggressive or farsighted management, Union Pacific Corp.—owner of the Union Pacific RR—stands as an exception to the rule. A little more than a decade ago, the company decided there was little prospect for growth in the sluggish, highly regulated railroad industry and undertook an ambitious diversification program. It acquired oil exploration and mining businesses not only for access to profitable growth markets but also as a vehicle for exploiting the vast untapped natural resources on land owned by its railroad. Other railroads have copied UP's successful diversification formula, but none of them has come close to matching its success.

Benjamin F. Biaggini, chairman and chief executive officer of the connecting—and competing—Southern Pacific Transportation Co., says Union Pacific "is probably the strongest company in the railroad business today." What is now alarming Biaggini and his fellow railroad executives is that the Union Pacific RR seems on its way to becoming stronger still—for the parent company is again making a dramatic strategic turn. Just as it positioned itself in energy in the late 1960s, UP today is turning its attention back to railroading. Deregulation of the rail industry and soaring fuel costs are the compelling factors that, in UP's view, point toward tremendous profit and growth opportunities for railroads in the 1980s. Acting on that conviction, the company is pursuing a plan to merge the Union Pacific with the Missouri Pacific and the Western Pacific railroads.

This merger activity has triggered a series of defensive, shotgun-like marriages between other railroads trying to prevent UP from winning total dominance in rail transportation. It is generally acknowledged that if UP succeeds in its plan, it will mean a new era for the railroad industry. If UP fails, the industry will probably be nationalized. Either way, the railroad industry will never be the same.

The 9,500-mi. Union Pacific RR extends from Kansas City, Mo., and Omaha to Ogden, Utah. There, two long arms reach out, one to Portland, Ore., and Seattle, the other to Los Angeles and Long Beach, Calif. If the Interstate Commerce Commission approves, the Union Pacific will join with the 11,500-mi. Missouri Pacific, a railroad that blankets the southern Midwest. As part of the deal, UP will also acquire MP's wholly owned Mississippi River Transmission Corp., a 1,600-mi. natural gas pipeline system and exploration company. And in another transaction, UP will acquire the 1,700-mi. Western Pacific, gaining access for the first time into Northern California.

Thus, after an 11-year diversification program that saw Union Pacific's net income from its railroad grow in dollars but decline in percentage of total income to only 39% last year, management is now determined to help its railroad expand very rapidly. That does not mean the company has ever stopped helping the railroad, of course. "We've never shorted the railroad for a minute," says James H. Evans, UP's chairman and CEO. "They have all the capital they need. We don't like to tell them this too often, but we do have good managers on the railroad, and they do know what they're doing. It doesn't make any difference



what the program is: If they want it, we look at the projections and say yes."

What makes Union Pacific such a mover and shaker? The superficial answer is that, in 1862, Congress passed and President Abraham Lincoln signed a land grant bill giving UP immense stretches of land containing extremely valuable natural resources. A more profound and accurate answer, however, comes from the way the railroad and the natural resources have been managed. UP practices something virtually unheard-of in the railroad industry up until a few years ago: sophisticated, long-range, strategic planning.

The company's basic corporate strategy has two tenets. First, it aims to maintain the railroad in the best possible physical condition. Second, it aggressively develops natural resources to the point where they constitute at least 50% of total income. In 1979 management clearly overshot its target. Of total revenues of more than \$4 billion—up from \$2.9 billion the year before—more than \$2.2 billion came from nontransportation entities, mostly oil and gas. Of the company's net income of \$382.5 million, 61% came from nontransportation companies and 39% from the railroad.

Thus, the acquisition of the Missouri Pacific would do no damage to the corporate objective of a 50-50 split. Had UP and MP been one company last year, the combined total revenues would have been more than \$6 billion, and the combined net would have been nearly \$526 million, "almost equally split between transportation and nontransportation activities," according to William F. Surette, senior vice-president for finance at UP.

"The merger is not likely to be accomplished before 1982 and possibly not until early 1983," says Chairman Evans. "By that time, we believe the ratio will again tilt toward our energy and natural resource businesses."

Evans is probably understating the case. UP's fastest-growing operating company is Champlin Petroleum Co., which it bought in 1970 for \$240 million. Champlin is a fully integrated oil company engaged in the exploration, production, manufacturing, transportation, and marketing of petroleum products. Earlier this year the subsidiary made UP stock a Wall Street favorite with news of successful test drilling along the Wyoming-Utah border in the Overthrust Belt (map, page 66). This is a geologic feature stretching from Alberta, Canada, to Arizona that is thought to contain the best possibilities for significant oil and gas discoveries in the continental U. S.—and it passes right through the land Congress and President Lincoln gave to UP.

Coal, uranium, and trona

Champlin's drilling results indicate that there may be a pool of natural gas in the Overthrust Belt that could run for as much as 13 mi., representing a reserve of several trillion cubic feet. Not far away from those earlier wells, a Champlin partner has now completed a wildcat well that has three productive pay zones with a combined flow rate of more than 40 million cu. ft. per day. UP has participated in 105 of the 142 wells that have been completed on land it owns above the Overthrust Belt and in 15 out of the 17 discoveries. "Our participation in these sections of the Overthrust Belt averages 18%," declares UP Vice-President Surette. "We are spending money to develop the Overthrust Belt just as fast as we can possibly do so in a practical manner."

Champlin has three refineries: in Corpus Christi, Tex.; Enid, Okla.; and Wilmington, Calif. The last site is where the company made its first and biggest oil strike—a fact UP officials like to point out to those who say Union Pacific Corp.'s prosperity is largely due to the land grants; Wilmington is at least 1,000 mi. away from the nearest grant. By the end of this year, Champlin will have invested \$500 million upgrading its refineries since 1975.

The second-largest nonrailroad operating company in the UP structure, Rocky Mountain Energy Co., conducts extensive mining operations. Its total coal reserves, estimated at 10 billion tons, are the fourth-largest in the U. S., and at today's prices and with currently available technology, some 2 billion tons

Coal power: If its merger is approved, Union Pacific will be able to haul the coal it owns to most major ports.

of this total can be mined economically. Production from RME's mines this year will be an estimated 15 million tons, most of which will be hauled at least part of the way by the Union Pacific RR. With the acquisition of the Missouri Pacific and the Western Pacific, more of Rocky Mountain's output will go UP all the way—and that should go far to enrich the railroad's coffers.

Rocky Mountain is also a significant miner of uranium ore and half-owner and miner of the largest trona deposit in the world, estimated at 50 billion tons and situated in western Wyoming. Trona is the mineral from which natural soda ash is processed, and soda ash is vital in the manufacture of glass, pharmaceuticals, and biodegradable detergents, among a host of other products.

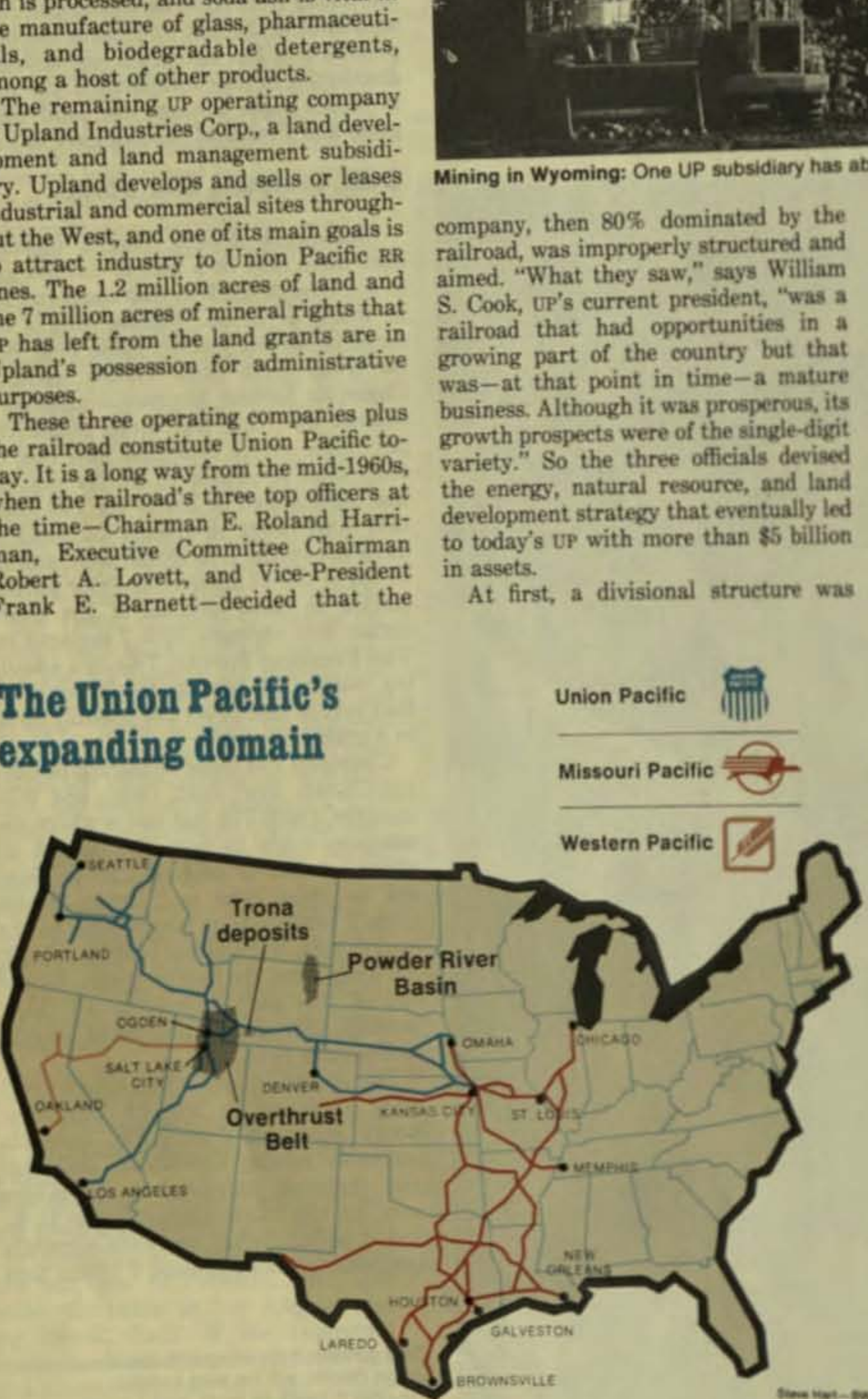
The remaining UP operating company is Upland Industries Corp., a land development and land management subsidiary. Upland develops and sells or leases industrial and commercial sites throughout the West, and one of its main goals is to attract industry to Union Pacific RR lines. The 1.2 million acres of land and the 7 million acres of mineral rights that UP has left from the land grants are in Upland's possession for administrative purposes.

These three operating companies plus the railroad constitute Union Pacific today. It is a long way from the mid-1960s, when the railroad's three top officers at the time—Chairman E. Roland Harriman, Executive Committee Chairman Robert A. Lovett, and Vice-President Frank E. Barnett—decided that the company, then 80% dominated by the railroad, was improperly structured and aimed. "What they saw," says William S. Cook, UP's current president, "was a railroad that had opportunities in a growing part of the country but that was—at that point in time—a mature business. Although it was prosperous, its growth prospects were of the single-digit variety." So the three officials devised the energy, natural resource, and land development strategy that eventually led to today's UP with more than $5 billion in assets.

At first, a divisional structure was created to manage the company's entities, but this was found to be impractical, and a holding company was formed in 1969. The holding company had several advantages. It got UP out from under the heavy hand of ICC regulation. It permitted UP to borrow without needing a railroad purpose. Most important, it attracted creative, aggressive, fast-moving managers who had been reluctant to work for a railroad.

Mining in Wyoming: One UP subsidiary has about 10 billion tons of coal reserves . . .

The Union Pacific's expanding domain

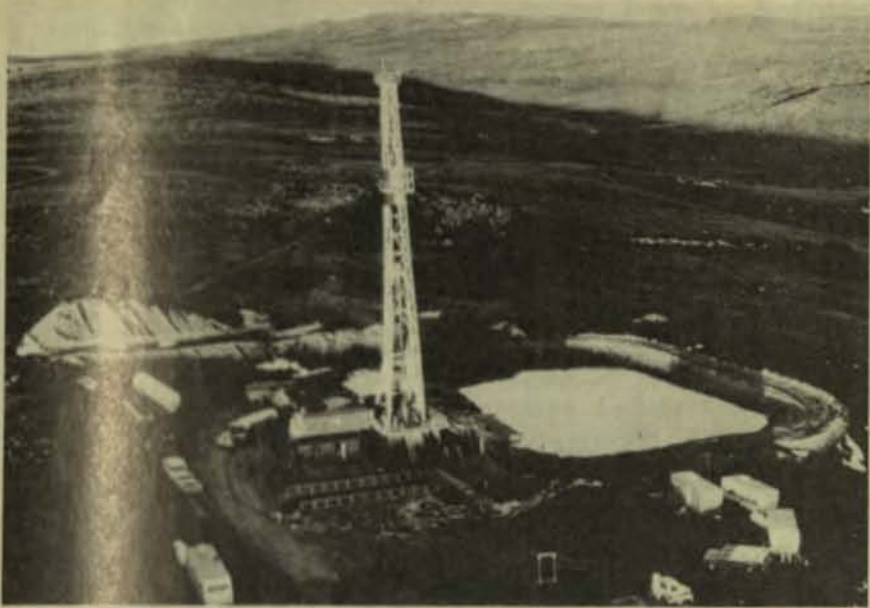


An eye on the regulators

Today, the operating companies are as independent as any within a conglomerate. Champlin's headquarters are in Fort Worth, Rocky Mountain's are in Denver, Upland Industries' and the railroad's are in Omaha, and the holding company is based in New York. The New York people see their role as making sure that all of the operating companies have good strategic plans as well as "ambitious but realistic short-term objectives," says President Cook. "Then we get out of their way and let them get the job done, being sure to monitor their results carefully to ensure that they are on track."

Like many of the current UP officers, Charles L. Eaton, vice-president for strategic planning in New York, is a veteran of General Electric Co., and he—and the others—simply carried GE management techniques over to UP. One of the planning techniques Eaton insists on is an annual examination of the environment in which each of the operating companies must live.

Eaton also wants to know what the competition and the regulatory agencies are thinking and doing. That is how the railroad and the parent corporation knew early on that the railroad world



. . . while another subsidiary is finding oil and gas in the Overthrust Belt.

was changing—and how they started planning for it.

"We knew our No. 1 bride was the Missouri Pacific some time ago," Evans says. "It wasn't a rash, swift decision. Our strategic planners had researched that one three years ago. But three years ago the regulatory climate hadn't jelled. And also we had to make the decision whether we wanted to tie up more corporate assets and corporate commitments in the transportation business. That was a hard question three years ago. But the years that have ensued have clarified the answer: Yes, we did."

One of the key changes in the regulatory climate that UP planners detected was rail deregulation. The present Administration in Washington is confronting an appalling problem. Transportation Dept. studies show that, by 1985, the railroad industry—excluding the government-funded Consolidated Rail Corp. (Conrail)—will fall between $13 billion and $16 billion short of the funds it needs to replace track and rolling stock and to repay debt.

The Transportation Dept. sees only two alternatives: to subsidize the industry, which in effect would nationalize it, or to free the industry to find its own level of profitability through mergers, marketplace pricing, and reduction of overhead. The government has chosen the latter.

Says Darius W. Gaskins Jr., the new ICC chairman: "This commission is attempting to judge mergers by the same standards they have always been judged. But perhaps our interpretation of the competitive situation is quite different. Past commissions thought it was in the public interest to eliminate the possibility of price competition. This commission has the position of encouraging price competition among railroads, especially after a merger."

John C. Kenefick, president of Union Pacific RR, observes that "deregulation will force a big change in inter-railroad relationships, making interline and connecting rates difficult to work out. It becomes essential for a major railroad system to reach as many markets as possible, and it will be unsatisfactory to depend upon connections. In a deregulated environment, you are in control of your own destiny."

Even before the government decided on deregulation, the competitive environment on the West Coast and in the Midwest received a jolt when the Southern Pacific announced its intention—later approved by the ICC—to acquire from the bankrupt Chicago, Rock Island & Pacific RR the line running from Tucumcari, N. M., to St. Louis. The SP, which blankets the West Coast as well as the Southwest, now reaches St. Louis either by its own circuitous route through Houston or by a connection with the UP at Ogden. Using the Tucumcari line instead of its own track will shorten the SP's route by 400 mi., no small consideration when diesel fuel costs up to $1 per gal. In addition, the new route will tempt the SP to carry eastbound shipments all the way on its own lines, rather than sharing any revenue with UP.

UP's overtures to the Missouri Pacific, therefore, were partly an offensive tactic, to open up new marketing opportunities after deregulation, and partly defensive, to respond to competitive pressures. When these two forces became overwhelming last year, Kenefick fired off a memorandum to New York seeking a go-ahead on the deal. "I told them the jig is up," he recalls.

Triggering more mergers

The combined UP-MP-WP would create a formidable route structure reaching from the Midwest and the Gulf States to every major market in the Pacific Northwest and California except San Diego. "You have the making of the strongest system in the West," says Andras R. Petery, rail analyst with Morgan Stanley & Co. Adds SP's Biaggini: "The Union Pacific is pretty much the envy of everybody in the railroad business. With the Missouri Pacific, it is adding a well-maintained property with strengths that include carrying petrochemicals from the Gulf and grain and coal from the Midwest."

Indeed, the 22,700-mi. system that would emerge is galvanizing a thorough reassessment of possible combinations throughout the industry. It has triggered a proposed merger between the SP and Santa Fe Industries Inc., spilled over into the South and East to bring the Southern Ry. and the Norfolk & Western Ry. together, and left smaller roads pondering their future. Not surprisingly, the deal between the Missouri Pacific—

Chairman Evans: "If we could wave a magic wand over every merger in the works, we would bless every one."

Patrick D. Pagnano

frequently referred to in railroad circles as the "MoP"—and the Union Pacific is now dubbed the "mopup." Gloats President Kenefick: "We got there firstest with the mostest."

"What Union Pacific is doing is making sure its railroad continues to grow in the future competitive environment," says Morgan Stanley's Petery. "This underlines the growth mission of the railroad. If UP had not done anything, other railroads would have jumped in to cut off its growth potential." Adds John V. Pincavage, rail analyst at Paine Webber Mitchell Hutchins Inc.: "Even though the genesis of this move may have been defensive, it's the most offensive merger UP could have gone after." Without the Missouri Pacific and the Western Pacific, Pincavage estimates that the Union Pacific RR would grow at a compound annual rate of 13% to 15% over the next five years, compared with a 20%-to-22% growth rate for oil and gas and a 25%-to-30% growth rate for mining. Thus, the railroad would pull down the earnings potential of the total corporation. Over the past five years, net income for the Union Pacific rose 81.5% to \$150.7 million, while net at the MP jumped 141% to \$110 million.

What makes the Missouri Pacific particularly attractive to UP is that it serves such a rapidly growing section of the Sunbelt. Last year 161 industries opened shop with capital investments totaling \$2.2 billion along the lines of the Missouri Pacific, and there are 150 announced projects worth \$20 billion in investments planned for the next five years.

Of these future projects, roughly 20% are petrochemical operations. Obviously, the merged system will open up huge new coal markets for Union Pacific, not only to sell its own coal but also to haul the fuel to these developing industries. Moreover, the merged system will be moving increasing volumes of petrochemicals north and west.

The proposed merger links the two railroads that already have the industry's highest traffic densities—a key ingredient in railroad profitability. Further, the two roads have a healthy mix of freight traffic in bulk commodities that tend to be more resistant to recessions and truck competition. For example, almost 51% of the Union Pacific RR's freight traffic in 1979 came from coal, farm products, and soda ash, while 37.5% of the Missouri Pacific's came from coal, petroleum products, and chemicals.

Coal, which is on the front page of virtually every major newspaper these days, has long been under careful scrutiny by UP's planning staff. Because so much of the company is invested in energy, UP is continually updating studies of world petroleum reserves and needs, coal reserves and needs, and the status of nuclear energy. Armed with this information, UP saw the importance of both the Missouri Pacific and the Western Pacific for hauling coal. With these two railroads in its system, the company will have complete flexibility to move export coal—and grain—through any West Coast port except San Diego and through any of the major Gulf Coast ports east of the Mississippi River. UP's Evans is so optimistic about export coal that he is prepared to invest huge sums of corporate capital in offshore coal-loading docks to permit his coal to be shipped in more efficient, deep-draft bulk carriers.

Kenefick of the UP: With deregulation, railroads must develop their own routes to reach their markets.

As for all its traffic, the Union Pacific RR already has the longest average haul in the industry, 711 mi., which is another reason why it is so profitable. The addition of two more railroads will vastly extend its reach, putting it into new cities—such as Chicago, St. Louis, Memphis, New Orleans, and Oakland, Calif.—where it can connect with more railroads. Clearly, this will give it significant new marketing opportunities.

In spite of these opportunities, Kenefick insists that the UP-MP-WP combination is not designed to raid traffic from other railroads. "We did not approach the merger on the basis of gaining traffic at the expense of other systems," he declares. That may not be the intention, but it is clear that the strength of the combined companies and their route structure will at least blunt efforts by other systems to gain new marketing toeholds while driving smaller railroads either to the precipice or into the arms of the emerging super-railroads.

Ironically, the first of the proposed super-railroad systems, that of the Burlington Northern and the St. Louis-San Francisco Ry., announced in 1977, may be weakened by the subsequent merger activity. Burlington Northern Inc., which received 49% of its freight traffic last year from coal shipped from its huge reserves in eastern Wyoming, could well find itself locked in fierce competition with UP on the long and profitable hauls to eastern Texas. The largest seam of coal in the West both suitable for strip mining and with the least overburden is in the Powder River Basin in eastern Wyoming, now served by the Burlington Northern. But this could be vulnerable to UP's expanded system, especially if the government approves a 56-mi. rail line, to be owned and operated by Chicago & North Western Transportation Co., that would link the Powder River Basin area with a UP branch line. That line could boost UP's haulage of coal by 25 million tons by 1985.

UP's far broader reach into Gulf ports will also hamper BN's efforts to expand its export grain business. In manufactured goods, too, UP appears to have an advantage over BN-Frisco. Frets Thomas J. Lamphier, president of Burlington Northern's Transportation Div.: "The Missouri Pacific merger gives the UP an opportunity to get down to the Sunbelt industries for shipments to the West Coast."

Meanwhile, UP's acquisition of the Western Pacific, with its gently graded route into the San Francisco Bay area, threatens the Southern Pacific, whose line roughly parallels the WP. It is characteristic of the industry that Evans went after the WP because he foresaw Biaggini of Southern Pacific diverting traffic away from the UP connection at Ogden in favor of SP's new Tucumcari route. Now Biaggini says, "If the Union Pacific gets the Western Pacific, we would be seriously affected."

But Biaggini is the first to admit that rail combinations will enhance competition and provide better shipper service. "I've said over and over again that rail-

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roads don't have a proprietary business. You have to give a competitive price and good service to maintain good customer relations. The single system has a greater advantage in its ability to render that service," he says.

The increased competition, coupled with the easing of pricing regulations, however, is likely to touch off a vigorous rate war among the remaining railroad systems. Says Lamphier of the BN: "There will be some drastic changes. I'm not so naive to think we won't get involved in some price wars." Those systems with the longest hauls and the broadest mix of traffic should emerge as the strongest. The Union Pacific's Kenefick is prepared. "We may cut ourselves to pieces with price wars," he says, "but if you have a system that covers all the bases, you can defend yourself."

Illusory efficiency

Most large shippers are clearly pleased by the prospect of fewer but more efficient railroads. "Long-range, this is going to enhance the railroads' ability to serve us in the way we want to be served," observes William K. Smith, vice-president of transportation at General Mills Inc., where the amount of goods shipped by rail has dropped from 90% of the company's output to 70% in the past 10 years. "This could stop the erosion of our rail usage and maybe even turn it around a point or two," Smith says. Because both the UP and the MP are credited with knowing where every freight car is at all times and for running trains on schedule, he adds: "Anybody who needs service capability in his area should be in seventh heaven."

Yet Smith discounts the railroads' claims that mergers will dramatically siphon off competing truck traffic. While he concedes that the mergers will consolidate many of the railroads' far-flung management, traffic, and pricing decisions, "there will be no return to dominance by the railroads. Truckers manage their assets better," he says.

James V. Springrose, vice-president for transportation at Cargill Inc., also applauds the mergers as "positive steps that are long overdue. For the past couple of decades we have had railroads that are overbuilt and yet, paradoxically, cannot satisfy the needs of users," he says. And he agrees with Smith about the mergers having little effect on truck competition. "There is nothing inherent in a merger that will capture more [grain] business."

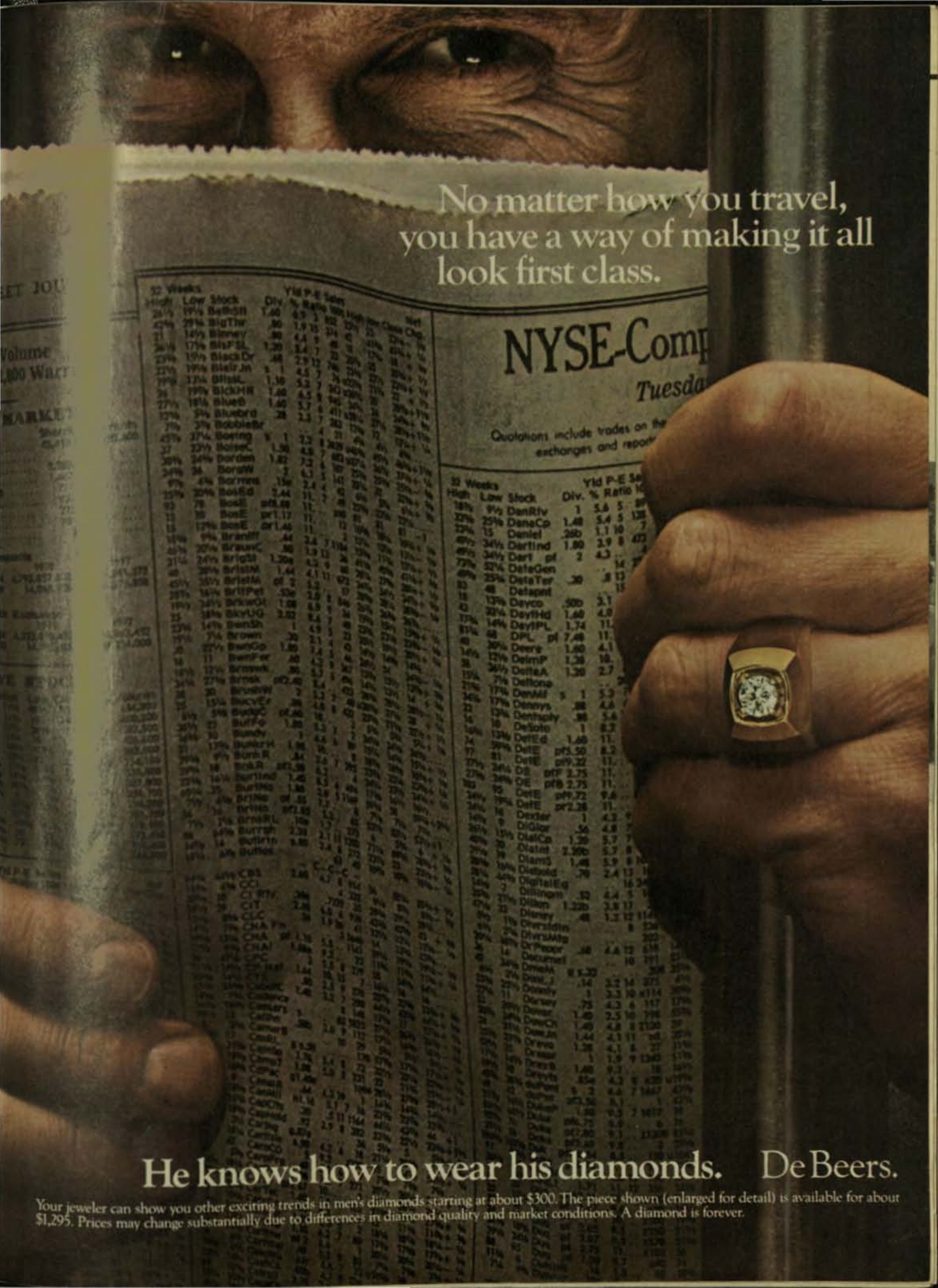
Moreover, there is a rising chorus of concern that the predictions of efficiency to be achieved automatically in so-called "mega-mergers" is illusory. As Burlington Northern's Lamphier wonders: "The Union Pacific and Missouri Pacific are highly centralized. Can they manage large geographic enterprises that way?" Adds Irvine O. Hockaday Jr., president of Kansas City Southern Industries Inc., holding company for the Kansas City Southern Ry.: "There may be a crossover point in terms of size beyond which sheer management intricacies become a negative. The UP-MP-WP merger raises all sorts of organizational and management challenges."

Downing B. Jenks, chairman of the Missouri Pacific, dismisses the notion that his company's merger is an awesome system to put together. He says matter-of-factly: "We will keep two separate profit centers to avoid getting a railroad that is too big to handle. By keeping them separate, on merger day everyone will go to work as usual. Keep in mind that these two railroads fit together very well. UP runs its railroad about the way we run ours, the condition of the properties is very similar, and the lines will function well from the start."

Whatever problems the merged UP system may have in consolidating its operations, they will be trivial compared to the problems confronting the railroads in the same territory that are not yet involved in the merger movement: the Missouri-Kansas-Texas (Katy), the Illinois Central Gulf, the Denver & Rio Grande Western, the Kansas City Southern, and the Chicago & North Western. Increasingly, these roads will find themselves surrounded by larger systems, bypassed on connecting traffic, and unable to offer competitive rates. The Katy, for example, estimates that it is likely to lose more than 20% of its revenue base because traffic will shift to consolidated systems.

The result is a furious search among smaller lines for larger partners, thus leading to more mergers. The fallout precipitated by the UP-MP-WP merger leads executives of these smaller roads to forecast an emerging industry oligopoly in which major systems carve up territories and set prices in league with each other. Rather than promoting a rational rail map, according to this forecast, the oligopoly will lead to the reimposition of regulations. "In five years everybody will be screaming about reregulation," predicts Samuel R. Freeman, vice-president of the Denver & Rio Grande Western RR. Adds the Kansas City Southern's Hockaday: "The irony is that on the 100th anniversary of the creation of the Interstate Commerce Commission [1987], the agency will have faded from the scene, but you will see a demand for its re-creation."

But Evans of Union Pacific has no such forebodings. "If we could wave a magic wand over every merger in the works," he says, "we would bless every one of them." ∎



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DATA PROCESSING

What makes Tandem run

Tandem Computers Inc. has to be one of the biggest success stories around—even in the fast-rising minicomputer industry where dramatic growth is sometimes taken for granted. In June the Cupertino (Calif.) company shipped its 1,000th computer just four years after delivering its first system. The company is growing at 100% annually, with revenues now running at a $100 million annual clip.

While Tandem's unique, single product still has no direct competitor, the young company's wild success is due equally to its unorthodox management style, which provides everything from Friday afternoon beer parties for its 1,100 workers to a sabbatical every four years and stock options for every employee. This "people-oriented" management style emphasizes complete informality, peer pressure, and open communications. There are few formal meetings or reviews, and the management team and organizational structure is already in place for a $500 million-plus operation. Industry experts, in fact, expect Tandem to reach easily its revenue goal of $500 million annually by 1983.

Reliability. Tandem's present prosperity is built on a "fail-safe" computer that will not lose data if any part of the system goes down. While other fail-safe systems usually require a redundant, back-up computer that lies idle unless the on-line system fails, Tandem's computer design allows dual central processors to share the data-processing workload and to take over the entire job should one break down. The system's reliability makes it especially attractive to banks, airlines, and other businesses where lost or interrupted data means lost revenues.

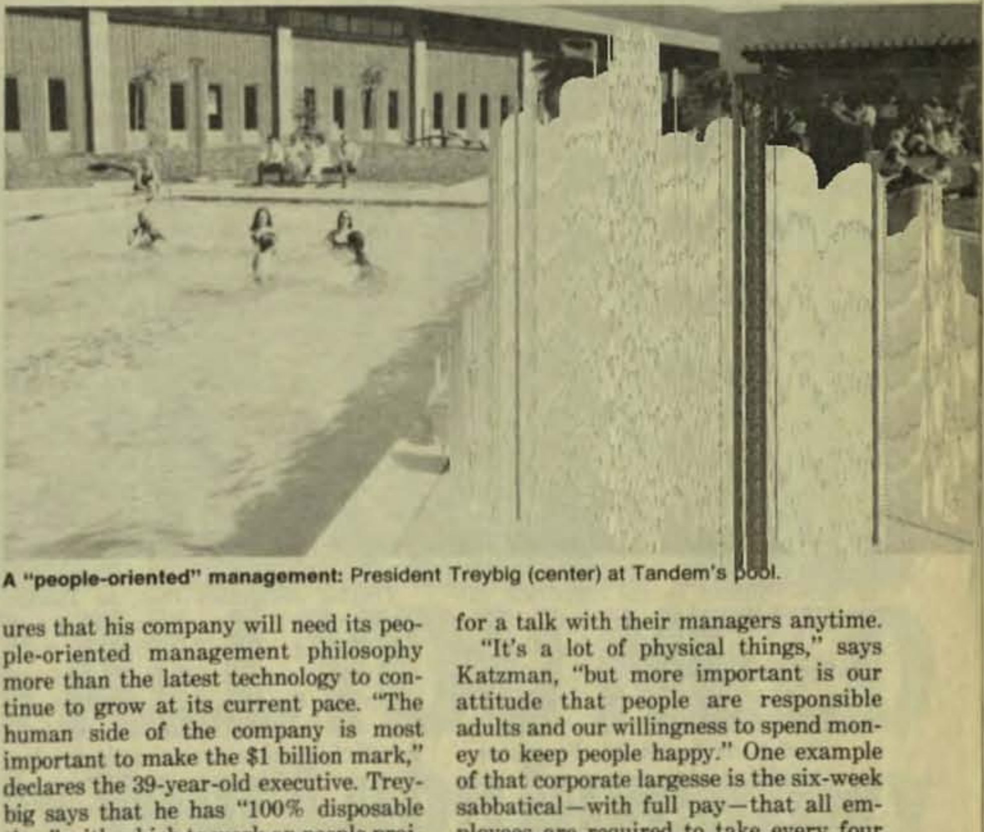
Without varying its management style, the computer maker has broken through the difficult growth transitions that any young company must pass. "Tandem has done very well at getting over the management plateaus at $3 million and again at about $50 million that affect growth," notes David E. Gold, a Saratoga (Calif.) consultant. And in the year ended Sept. 30, 1979, Tandem came within $1 million of the sales projection made in its 1974 business plan, boasts Thomas J. Perkins, Tandem's chairman and a partner in Kleiner, Perkins, Caulfield & Byers, the venture capital firm that provided the company with its initial seed money.

"When you get above $5 million, it's hard for a person to manage everything like a mother hen," say Gene M. Amdahl, founder and now chairman emeritus of Amdahl Corp. "As the company grows," Amdahl says, "it's easy to lose the entrepreneur's vision of what the company should be. But I don't believe it absolutely has to happen."

Neither does James G. Treybig, Tandem's co-founder and president, who figures that his company will need its people-oriented management philosophy more than the latest technology to continue to grow at its current pace. "The human side of the company is most important to make the $1 billion mark," declares the 39-year-old executive. Treybig says that he has "100% disposable time" with which to work on people projects such as his new chart of 100 management concepts that he uses to guide the company. The chart emphasizes such notions as pushing responsibility down the employee ranks to develop managers faster, hiring the best person rather than the cheapest, and promoting from within.

The genesis of Tandem's management philosophy comes from Hewlett-Packard Co., which is not too surprising, since Treybig, along with the other three founders—Michael D. Green, John C. Loustaunou, and James A. Katzman, all vice-presidents—worked at the Palo Alto computer and instrument maker before forming the company. "We learned at HP," says Katzman, "but we've extended that philosophy here."

At Tandem, for example, employees have neither the time clocks nor the name badges usually found at other high-technology companies in California's Silicon Valley. And its workers have flexible hours, a swimming pool that is open between 6 a. m. and 8 p. m., a volleyball court complete with locker room and showers, and an open-door policy that invites employees to drop in for a talk with their managers anytime.


J. Bruce Baumann

A "people-oriented" management: President Treybig (center) at Tandem's pool.

"It's a lot of physical things," says Katzman, "but more important is our attitude that people are responsible adults and our willingness to spend money to keep people happy." One example of that corporate largesse is the six-week sabbatical—with full pay—that all employees are required to take every four years. This month, too, Tandem employees will vote on future benefits, choosing from among increased medical coverage, a retirement plan, profit sharing, or vacation privileges at resort condominiums the company would acquire.

Low turnover. So far, Tandem's people philosophy has paid off in more than soaring revenues. "The company is able to attract really excellent people in [a geographical] area where it is supposed to be hard to get them," says Edwin B. Costello, an industry analyst with Sutro

& Co., a San Francisco brokerage house. And once employees join the company, they apparently stay. Katzman claims turnover runs 8% annually, far lower than the industry average of 23%.

Tandem's reputation for hiring top employees who stay is no accident, according to the company. Job candidates are often called back three or more times for interviews lasting several hours. And salary offers are never made until a recruit accepts a job. "They've got to decide they're not just coming for the money," declares Treybig.

Informal: Co-founder Katzman at a weekly party; lively action on Tandem's volleyball court.

The company prefers to hire experienced people because they require less training, but even these people have to be indoctrinated in the corporate culture. And that is no easy task at Tandem, which is growing so fast that the average employee has been with the company for only six weeks. Treybig personally participates in most new employee orientations to spread the management gospel. And he uses peer pressure to inculcate recruits in the Tandem way. For example, a group of assemblers from the factory floor recently walked into his office to complain about their manager. "[The manager] soon left because he didn't look on people as people," Treybig says. "Now everyone knows that that mistake was fixed, and other managers will see that if they don't do what's right, they will be fired."

Indeed, decisions are made informally, and executives get together in spontaneous meetings as problems arise. Admits Chief Financial Officer Loustaunou: "We have no scheduled reviews of things like progress reports." So far, the company has managed quite well without formal meetings. Outsiders often note that communications among the top executives flow as freely as the beer that is served every Friday afternoon. "If you ask the same question of several managers, you always get the same answer," says Alvin C. Rice, a Tandem director.

Tighter control. Not everyone, however, is impressed with Tandem's management style. "Tandem's founders thought that HP had too many meetings, too many memos, and too much management," recalls John V. Levy, a former Tandem engineer now working for Apple Computer Inc. "My impression," he says, "is that they did a total flip-flop."

Treybig recognizes that, as Tandem grows into a large company, ad hoc decision-making will not suffice. So he is instituting more controls. In accounts receivable, for example, Loustaunou says that the company has grown too large for all of the top managers to be involved with each problem account. "A year ago, we had maybe 10 problem accounts," he says. "Now it is 30 to 40, and it is more appropriate to have our people tell us in writing the status of their accounts." Similarly, while the company still has no wage or salary structure, Loustaunou notes that it is only a question of time before formal review procedures are established.

But that does not mean that Tandem lacks controls on company operations. The company has rigid procedures for implementing production controls, cost standards, quality control, and management reporting systems. To handle these jobs, Tandem has eight separate in-house computer systems. "They have an informal management style imposed upon a very organized and disciplined set of business standards," says Rice. "You can't have their kind of growth without having those in place."

Treybig and his colleagues spend long hours preparing the company for the soaring growth they expect in the next few years. For instance, the executive team includes 14 vice-presidents, more than the company currently requires but necessary if it makes in three years its goal of $500 million in annual revenues. To handle that size company, Tandem has realigned its top management. Five management teams were given responsibility for marketing and production on a geographical basis.

The question remains, however, whether Tandem's Non-Stop computer can continue to be a nonstop success. While the Non-Stop still has no direct competition, Digital Equipment Corp. and several other companies are reportedly developing competitive systems. But industry observers predict that Tandem's rivals will have a difficult time duplicating the company's software developments in less than three years. "You can't have a baby in a month by making nine women pregnant," comments analyst Costello.

Confident. Treybig is even more confident of Tandem's ability to weather any competitive storm. The only inhibiting factor on Tandem's growth now, Treybig says, is the reluctance of some customers to buy computers from a vendor that has only $100 million in sales.

To raise his credibility with both customers and Wall Street, Treybig is running the company on a debt-free basis. But to do this and still grow at 100% annually means that Tandem has had to sell additional stock on a yearly basis. As a result, the number of shares outstanding has increased more than tenfold in the past five years to 5.2 million shares.

But James R. Berdell of Montgomery Securities in San Francisco points out that Tandem's price-earnings ratio of 36 is the highest of all of the technology stocks that he follows and almost double the computer industry average. For Treybig, such success is merely part of his long-term plan. "I never started Tandem thinking only of a $100 million company," the brash executive exclaims. "To build a $10 billion company where people loved to work would be a start." ■

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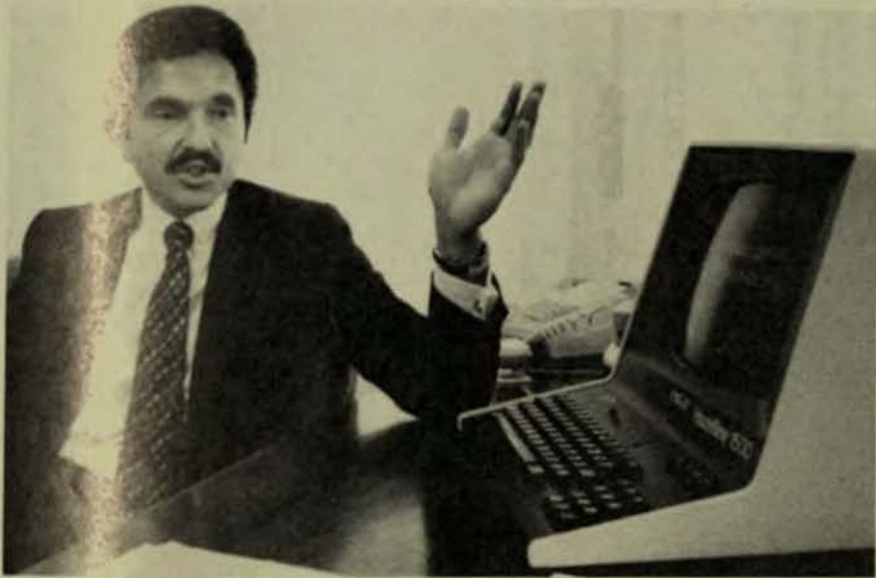

Patrick D. Pagnano

Poppel of Booz Allen: "The potential for time savings by 1985 . . . is close to 15%."

Automating the manager's office can play a major role in boosting white-collar productivity over the next five years, even though there will be plenty of executive resistance to such sweeping changes. The reason is that the average manager or professional now spends about 25% of his time on the job in such unproductive activities as making phone calls that are not answered or searching for people and information. According to a new study by Booz, Allen & Hamilton Inc., managerial productivity can be significantly improved by electronic mail, information retrieval systems, and other tools of the automated office.

Nearly 300 managers and professionals in 15 major U. S. corporations took part in the Booz Allen project. "The potential for time savings by 1985 for the participants is close to 15%," says Harvey L. Poppel, senior vice-president of the New York consulting firm, who headed the study. "And 9% of this reduction," he believes, "is achievable by 1982."

Different needs. Companies taking part in the study generally agree that their executives will become more productive when they start learning how to use these new office automation tools. "We're confident that the people we're addressing will use that [additional] time to get more work done," says Philip J. Shaughnessy, assistant vice-president of administrative services at Aetna Life & Casualty Co.

Even more important, according to the participating companies, is that office automation will help to improve the quality of work. "We can't prove that a manager will make better decisions simply because he has better information," notes Cornelius H. Sullivan, manager of the advanced technology group at the First National Bank of Chicago, "but we can show that we can give a manager more information or the same amount of information in less time. We can also demonstrate that the information we give him can be made more precise." Some 20 operations managers at the Chicago bank kept detailed records of their daily routine for the Booz Allen project.

A corporation need not move immediately into a full-blown office of the future. "Only a few tools will account for the [projected] savings," says Booz Allen's Poppel. And these will differ, depending on the type of work that the managers perform.

Chicago's First National Bank figures that it would benefit most by installing electronic mail and voice message systems that reduce the time executives spend looking for people or making phone calls that are not answered. Sullivan also figures that by storing data electronically, errors would be eliminated. For example, he says, mistakes in transferring internal funds should be reduced when instructions are transmitted electronically, because they are less likely to get lost on someone's desk or in the interoffice mail.

At Aetna, the 12 salesmen who participated in the study would benefit most from an information retrieval system, according to Vice-President Shaughnessy. He says that such an electronic aid would help the salesmen to improve customer relations by providing them with more up-to-date information.

Despite the opportunity for reducing unwanted chores, managers and professionals alike will resist these technological changes in the workplace, Booz Allen predicts. "Behavior adaptations are still a very slow process," concedes Poppel. Surprisingly, his project team found that managerial resistance to automated office technology was not so much a function of age, echelon, or education, as it was of tenure within the organization. Because they are moving on an established career path, executives who have been with a company the longest have the least incentive to change. But, adds First National's Sullivan, "A lot of resistance will evaporate if one sees one's boss, instead of a secretary, using the equipment."

Crucial step. Overcoming top management resistance to change is no easy task. And without the full support of top management, any move toward automating the office is doomed to failure, say most industry experts. Poppel hopes the Booz Allen study will help convince management that the economics are in favor of the investment. "Just the cost of the time saved equals 15% or more of the average pretax profits," he says, adding: "The saving is more like 30% for banking and financial institutions, because they have thinner margins and are more people-intensive."

Most of the companies in the survey plan to wait until the new office automation equipment is easier to use before they provide their managers with terminals on a wide scale. But they do plan to start experimenting with this technology. That is the crucial step right now, according to Poppel. "Five years from now, there will not be an opportunity to telescope the time it takes to get these things done," he says. "Enough will be unique to each organization that unless you get your feet wet [now], you won't know what is happening." ■

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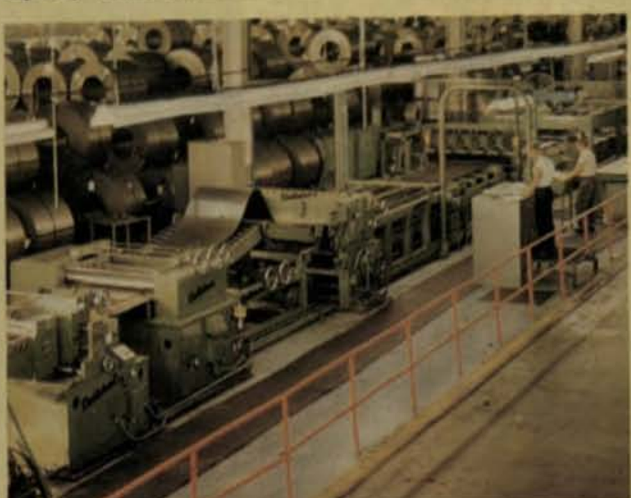

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COMPUTERS

Why HP is talking IBM's language

Gibbons: IBM programs can be converted to an HP 300 in less than 10 minutes.

Hewlett-Packard Co. has not been able to build the kind of market share with its HP 300 small business computer that it has with other products, which have propelled it to the No. 2 spot in overall minicomputer sales. In fact, HP has sold only 400 systems since the 300 was introduced in 1978. But on July 3 the Palo Alto company announced a product enhancement and a strategy aimed at boosting its share of the small business computer market.

"The HP 300 has not done particularly well . . . It may be because [HP is] having some problems in finding appropriate ways to sell it," comments Grant S. Bushee, an industry analyst with Dataquest Inc. in Cupertino, Calif. HP acknowledges that its impact on the small business computer market has been negligible so far, but it believes that it now has the key to change that.

The plan is to take on International Business Machines Corp. by going after the more than 700 IBM customers a month who order an IBM System/34 or System/38 to replace their obsolete IBM System/32. "For every system 300 we sell, you can most likely bet it will be a System/34 that won't go in," predicts Fred M. Gibbons, marketing manager for HP's business computer systems.

Direct assault. At the core of HP's latest marketing thrust is a new software package for the HP 300 that converts all of the applications software written in RPG—the software programming language for the IBM models—into the HP RPG language used by the HP system. This provides System/32 users a viable alternative to IBM when they want to buy a more powerful machine. Without the new software, IBM customers would have to spend large sums of money and time converting their IBM programs into a language that another brand of computer could understand.

HP's strategy to grow its customer base is by no means unique. "IBM is always the target for everyone in the information processing industry who wants to enlarge his submarket," says Ulric Weil, a computer analyst at Morgan Stanley & Co. in New York. Sperry Univac, NCR, and Honeywell all have RPG conversion tools to enable them to attract IBM customers. "Other people have translators," says Greg R. Leveille, director of computer research for Creative Strategies International in San Jose, Calif., "but to get them to work often can take months." With the new HP software, however, Gibbons claims that a

Briefs

Add another company to the long list of competitors for the word processing equipment market. On June 24, Hazeltine Corp. introduced a shared resource system on which it expects to begin delivery late this year through a combination of direct sales and dealers. But industry observers believe that the Greenlawn (N. Y.) company may sign an agreement before that time with NCR Corp., the Dayton mainframe computer maker. Neither company will comment on its plans, but observers speculate that NCR, with its large sales staff, will distribute the Hazeltine system until NCR can get its own office automation products on the market—a day that is still some two years off. Hazeltine's new system, called Opus, costs $27,600 for two workstations, a central storage unit, and a printer.

The one-time leader in the market for stand-alone, display word processors, Vydec Inc., is finally hopping on the shared-systems bandwagon. On June 24 the Exxon Information Systems company announced a controller that will allow all of its stand-alone models to communicate not only with each other but also with the Intelligent Typewriter manufactured by Qyx, another Exxon division. Deliveries of the $20,000 controller will begin early in 1981. Vydec has still not begun deliveries on its dual-display 4000 workstation, which the company announced one year ago, but customers are now receiving the programmable 2000 model machine that was announced at the same time.

The market for communications processors will grow at a 19.4% compound annual rate to $1.2 billion in 1984, according to a recent study by Creative Strategies International. Most of the growth will go to large mainframe computer makers as customers decide to tie their data processing equipment together into a network. But after 1984, warns the San Jose (Calif.) market researcher, the market for communications processors may decline as such services as American Telephone & Telegraph Co.'s Advanced Communications Service come on stream to do the work now done by the communication processors.

Volcanic ash fallout from the Mt. St. Helens eruptions interferes with computer operations at many installations in the Pacific Northwest. Companies report that clogged air filters are causing trouble with equipment. The ash can also literally polish away the magnetic coating on memory disks, causing an irreversible loss of data. The ash is fine enough to penetrate floppy disks even when they are packaged with liners designed to pick up dust and debris. And some computer makers are postponing plans to build plants in the area.

customer will be able to convert an RPG program to work on the HP 300 computer in only 6 to 10 minutes. Unlike other translators, the HP version does not emulate the IBM system, an approach that greatly reduces a program's efficiency, Gibbons says. In fact, he claims, by converting the IBM software to the HP 300 operating system, some programs actually run faster. And Leveille predicts that the software—which cost HP $1.5 million to develop—could win the mini maker as many as 900 additional accounts over the next two years.

A question of time. The HP campaign to win over users of System/32 is timed to take advantage of a delivery problem that IBM has had with the System/38. It was announced 18 months ago but is still not being shipped in any quantity. HP will not have much time to cash in on this delay, however. Industry watchers say that IBM has quietly shipped the first System/38 models and will begin to ship in larger quantities by this July. "That's a pretty short time window [for HP] to aim for," warns H. Glen Haney, vice-president of worldwide marketing at Sperry Univac. "I don't think you can build a strategy on it."

While HP says that the IBM delivery lag will help its sales, it is by no means counting on the delay to make its RPG marketing plan work. "We are not second-sourcing IBM," Gibbons insists. "We are trying to tap into the RPG base and bridge customers to the HP 300, which we feel offers superior features."

Even before the RPG converter was rolled out, industry experts and customers alike were high on the HP small business computer. For less than $75,000, the 300 offers users a data-base management capability that enables operators to retrieve information stored in the computer in much the same way that they would with manual files.

Still, it will obviously take more than a superior product to pull business away from IBM. Industry analysts note that IBM's customer loyalty is close to 95%—only 5% defect to the competition. "If customers are already with IBM, they have to be very disgruntled to move," says one IBM watcher. For HP, though, doing battle with the giant is all part of a careful plan to become a major factor in the booming market for small business computers. "We saw the RPG market and view it as a fundamental way to get people onto our products," Gibbons says. "There's a niche there for us." ■

Ira Wyman

Abandoned dumps would be cleaned up using funds mostly provided by industry.

ENVIRONMENT

Closer to a cleanup superfund

Election-year pressures, publicity about Love Canal, and the need to come up with new federal revenues are propelling Congress toward passage of a "superfund" bill that would tax industry to create a fund to clean up abandoned, "orphan," waste dumps. Although House and Senate versions of the bill differ sharply, the lawmakers will probably settle on a fund at least as large as the one approved by the House Ways & Means Committee on June 20: $1.2 billion, 75% of which would come from the users of crude oil and the producers of petrochemical feedstocks and inorganic chemicals.

The chemical industry, which is the chief target of the tax, has fought it bitterly. But even more troubling to chemical companies is the prospect that the legislation will increase their vulnerability to lawsuits, especially if the Senate version passes. By easing rules of evidence and making owners liable for damage even if they are not negligent, the Senate bill helps individuals injured by toxic waste to obtain compensation through the courts. Even more important, the Senate bill does not limit liability to waste from dumps but applies it to almost all releases from nearly any facility—covering plants as well. "The sponsors of the bill intend to try to control environmental problems by encouraging people to sue," says Jeremiah J. Kenney, a lobbyist for Union Carbide Corp.

Lobbyists for the Chemical Manufacturers Assn. have already stumbled badly over the superfund. For months after the Administration first proposed it more than a year ago, the industry refused to consider any compromise. The CMA argued that the fee was punitive and unfair since it penalized an entire industry for actions of a few companies. CMA President Robert A. Roland insists that the existence of abandoned dumps is a "societal" problem, not one for the chemical industry, and that the federal government should pay cleanup costs. He suggests that there are at most 400 hazardous abandoned dumps—rather than 1,200 or more as the government estimates—and that the total cleanup would cost $300 million to $400 million.

'Soul-searching.' The industry now knows it will have to accept some fee and will try to revive the relatively modest $300 million fee set by the House Commerce Committee in May. The shift took "a lot of soul-searching," says Kenneth E. Davis, who, as governmental relations director for Rohm & Haas Co., was an early dissenter from the CMA's position, which he felt was unrealistic.

But it may be too late. The industry already has suffered for its miscues. For example, chemical lobbyists urged sending the Commerce Committee bill to Ways & Means. Some claim that this was a tactic to delay the bill, but CMA's Roland says that the industry wanted the fee scrutinized as a tax. In any case, the strategy backfired. Ways & Means, under pressure to come up with $4.2 billion in revenue to conform with the fiscal 1981 budget resolution, voted to triple the fee.

Industry's best chance for derailing the superfund now is delay. Even though passage by each house seems inevitable, reconciling sharply divergent House and Senate bills will be a "nightmare of a conference," says one lobbyist.

And Senator John Chafee (R-R. I.), a member of the Senate Environment & Public Works Committee, which completed action on its version on June 27, agrees it will be "difficult at best" to win passage before Congress adjourns in October. But he stresses, "Anyone who suggests that this is going away, or that it is a figment of the imaginations of a few politicians, has missed the signals." ■

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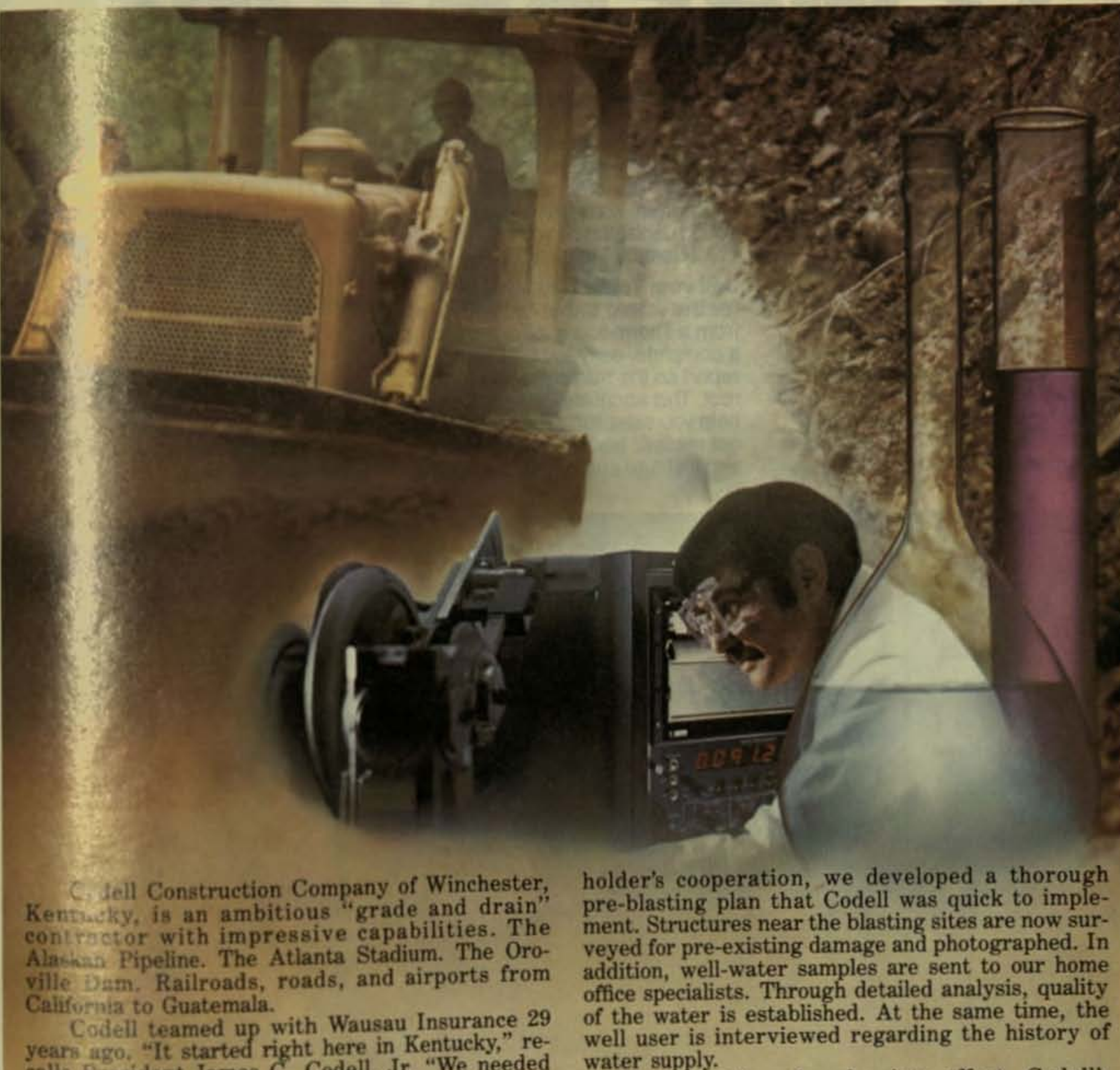

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When lawyers dictate the limits of marketing

Risks of antitrust litigation from wrong marketing decisions have grown larger

Although antitrust risks have always been greatest at the selling end of business enterprise, lawyers until recently have played a subordinate role in shaping marketing decisions. Today, however, antitrust attorneys have great power when it comes to marketing, because now, as never before, corporate marketing plans are colliding with federal antitrust laws.

"The lawyers end up determining what the parameters of the marketing plan will be," says Luther C. McKinney, senior vice-president of Quaker Oats Co. "There are more constraints imposed by the law through regulation and case law than there were 10 years ago." One measure of the change: An American Bar Assn. program that McKinney chaired in mid-June on antitrust counseling for marketing departments attracted some 300 lawyers to Chicago, including men and women from such companies as IBM, AT&T, Gulf Oil, Sears, PepsiCo, United Airlines, and Combustion Engineering.

Antitrust risks stemming from a wrong marketing decision have grown large for many reasons:

- The willingness of one business to sue another—and the growth of antitrust lawyers specializing in representing plaintiffs in such actions—increases the likelihood that a company's competitors or distributors will bring Clayton Act charges. Automobile dealers and service station operators have even won legislation allowing them to sue if their franchises are terminated.
- Congress has piled on laws that place warranty terms, franchise agreements, and debt collection practices under new scrutiny, particularly from the Federal Trade Commission.
- Changing priorities at the Washington regulatory agencies are leading to more marketing cases. The Justice Dept.'s antitrust chief, Sanford M. Litvack, who started on the job in January, is spurring attacks on manufacturers' attempts to dictate the prices at which their goods will be sold. At the FTC, the Robinson-Patman Act's curbs on treating customers unequally are getting new attention. In April the FTC issued an explosive complaint against Boise Cascade Corp., charging that the big lumber and paper company pressured producers of office supplies into giving it discounts that allow it to sell to commercial clients at lower prices than retail outlets can manage without comparable discounts.
- State attorneys general also are beefing up their antitrust efforts, bringing cases based on local market activity that might be too minor to interest federal regulators. Earlier this year, for instance, Massachusetts charged Bang & Olufsen of America and several retailers with conspiring to fix prices on its top-quality audio equipment. Even local litigation can add up to big dollars: In February, nine dairies in New Jersey agreed to pay the state more than $2 million to settle price-fixing charges.

Marketers' antitrust problems will increase in the years ahead, predicts Northwestern University marketing professor Philip Kotler. With sluggish economic growth expected, "the scene will change from normal competition to marketing warfare," he says. That multiplies the chances that, in a desperate drive for sales, companies will mount campaigns against competitors that—should they wind up in a courtroom—will look like attempts to monopolize, or other unlawful acts. Cleveland attorney Richard W. Pogue thinks tough times will lead to more problems with "full-line forcing," the practice of insisting that a customer who wants to stock certain items must take an entire range of the manufacturer's output.

Much of the current problem facing marketers is that "the law is changing extremely quickly in the area," as Washington lawyer Philip P. Zeidman notes. Thus, it was perfectly legal for manufacturers to dictate retail prices to stores in states with fair trade laws until Congress vetoed the practice in 1975. On another issue—how much service a distributor has to give a manufacturer to justify a preferential price—the FTC is currently rethinking its most recent ruling that the value of the service has to match the discount; it might return to the standard of the 1950s that no such equalization is necessary.

But the greatest confusion stems from a U. S. Supreme Court ruling three years ago in a dispute between General Telephone & Electronics Corp. and one of its California Sylvania dealers. In that case, the high court overturned a 1967 holding that it is always a violation of the antitrust laws for manufacturers to impose on distributors specific sales territories or, by implication, to dictate other conditions of sale. The rule now is that curbs on a distributor must be judged on the basis of their reasonableness after weighing all market facts.

Limiting locations. "It sure beats the old days, when everything was per se illegal," says New York antitrust lawyer Joshua R. Greenberg. But the price of distributional freedom is a high degree of uncertainty. "We're in a new era, which makes it very difficult for us to counsel with precision," adds James P. Melican, the General Motors Corp. attorney in charge of marketing issues.

For that reason, says McKinney at Quaker Oats, "choosing channels of distribution raises some very complicated choices for marketing executives." James Bruce, antitrust counsel at General Electric Co., warns that "you may start out with a program that is legal and have it quickly become illegal. That's why I don't like exclusive dealer arrangements." Greenberg suggests that alternatives—such as limiting the location from which a dealer can do business rather than the territory in which it can sell—can help ensure that distributors will work hard to develop their own territories without restricting the marketer to a precise sales area—a practice fraught with antitrust difficulties.

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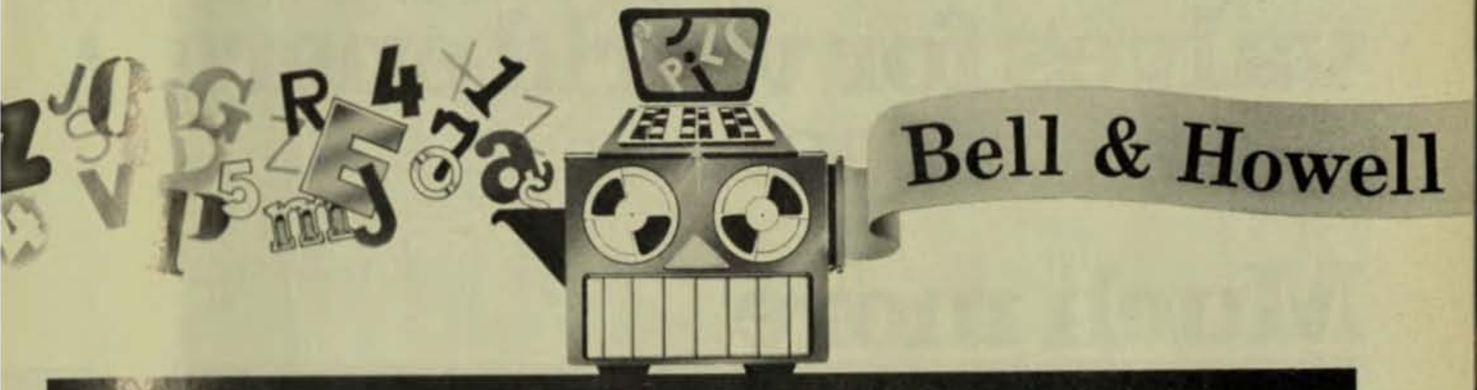

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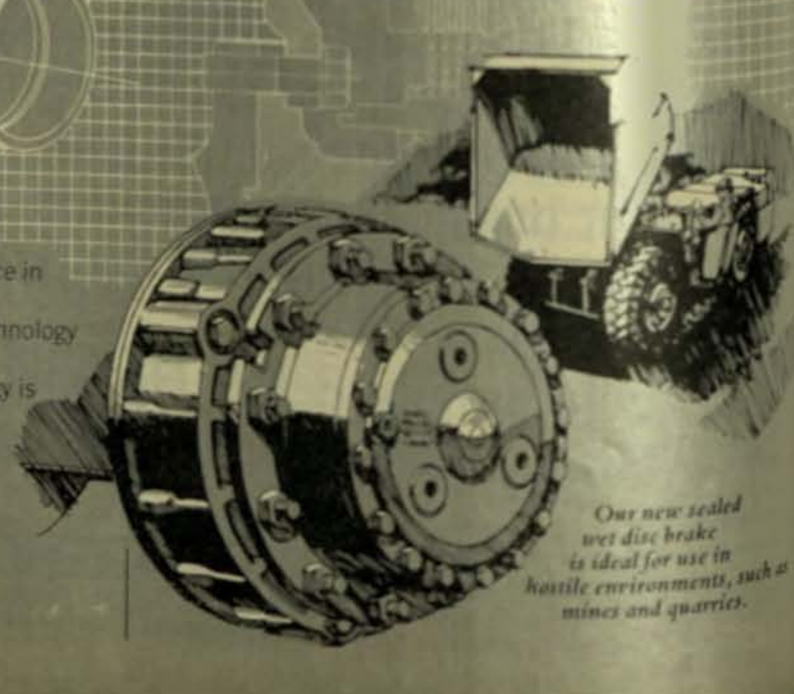

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given an exclusive territory will almost surely trigger an antitrust suit, Bruce warns. He figures the manufacturer should budget $1 million to fight the litigation. When the ABA last year studied private antitrust suits filed in the federal court in Manhattan, where they flow in at the rate of two a week, it found dealer terminations the No. 1 cause. The best way to fend off such a suit: generosity. Be ready to write off receivables due from the distributor, offer to buy back merchandise on hand, even consider buying up the distributor's whole business, advises Melican. Greenberg agrees: "The kind of person who's administering a program of dealer termination should not be one who's big at nickel and diming," he says.

Levi lawsuits. Other aspects of a corporation's marketing program can also get the company into antitrust trouble. Although a suggested list price standing alone is almost surely O. K., any pressure on customers to adhere to that recommendation is not. Levi Strauss & Co., for example, has been deluged with lawsuits all around the country claiming that it kept retailers from discounting its famous jeans. Earlier this year, the company agreed to pay $100,000 to settle a case brought by the state of Texas. Advertising plans can be taken as evidence of a monopolization scheme if they are clearly aimed at keeping a new competitor from winning a significant market share. Developing new brands to narrow the market occupied by a competitor can be dangerous. Even publicly announcing a price change in advance is

New laws, more suits, and greater enforcement increase lawyers' power

now taken by some antitrust enforcers as evidence of anticompetitive behavior.

With such dangers, it's easy for lawyers to say no to any marketing innovation. The challenge is not to keep clients' marketing departments out of trouble but to help them turn a profit—legally. Lawyers must "offer solutions your client can live with," insists John M. Richman, the company lawyer who worked his way up to chairman of Kraft Inc. "The lawyer is paid to get things done, not to say they can't be done," he argues.

Bernat Rosner, a senior attorney for Safeway Stores Inc., says he constantly weighs the opposing pulls of legality and profitability in the price-discrimination area. Cumulative annual discounts, for example, are generally recognized by antitrust lawyers as a violation of the Robinson-Patman Act. Discounts for big orders may be justifiable in terms of cost savings on billing and shipping, but a discount based on the total volume of business over a 12-month period may have little relation to any real cost advantages to the seller.

"And yet it is just a fact of life that they are being offered all the time. It has become a universal trade practice" in the grocery business, Rosner says. Telling his buyers they cannot take such a discount would put them at a competitive disadvantage. His compromise: Let them accept such discounts when offered, but be careful not to solicit them from suppliers.

Even when the antitrust advice leaves an out for accomplishing a primary selling goal, "marketers are very discouraged," Kotler says. "They feel that the decisions are actually being made by the lawyers." But that may be the price for survival in today's legal climate. According to Herbert M. Liss, manager of promotion and marketing services for Procter & Gamble Co.: "In the real world, while lawyers don't run the marketing departments, their advice is seldom if ever ignored." ▪

MONEY & BANKING

A cold eye at the discount window

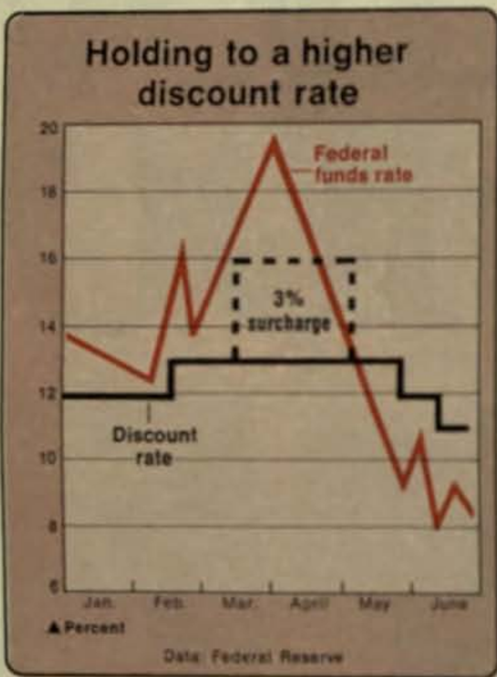
The Federal Reserve's discount window has long been the source of last resort for cash-short banks—as long as they were among the select few willing to pay the price of membership in the Fed. Under the massive financial reform bill Congress passed last March, access to the window was expanded tenfold to include virtually every financial institution in the country. Now, with a few new borrowers showing up already and lots more on the way, the Fed is making it clear it will be a more demanding, and mostly more expensive, lender than when the window still had a "members only" sign hung over it.

The Fed apparently means to hold the discount rate two percentage points or more above prevailing market rates—in contrast to last winter when the discount rate stayed far below market rates and banks borrowed cheap money from the Fed by the ton. The new approach will tend to make money more costly for lenders—and, in turn, for borrowers. Specifically, it will mean higher rates for borrowers in the dozen or so states that have traditionally held down rates through usury ceilings. The same legislation that set the new rules for the discount window also pre-empted the state ceilings, at least temporarily, and instituted a new federal ceiling one percentage point above the discount rate.

The way the Fed plans to do things from here on will also make it harder for investors to use the discount rate as a clue to Fed credit policy. "I think from now on we will see the discount rate as a penalty rate on a regular basis," says economist Leonard J. Santow of J. Henry Schroder Bank & Trust Co. Santow says he expects changes in the discount rate to lag, rather than lead, changes in market rates.

Dried-up borrowing. Market rates had dipped below 9% on occasion before the Fed finally lowered its rate on May 29 from the record 13% to 12%. They were consistently below 9% before the discount rate went to its present 11% in mid-June. This is the first time in three years the Fed has, in effect, exacted a penalty on banks that borrow from it. The shift has virtually dried up borrowing at the discount window, leaving the Fed's purchases of government securities to provide cash for the banking system.

The Fed gained its new leverage over the discount window, and over most of



Jerry Tortorella—BW

the U.S. financial system, through the Depository Institutions Deregulation & Monetary Control Act of 1980. Before Congress wrote the law, the steady departure of member banks from the Federal Reserve System, and the resulting shrinkage in the amount of bank reserves subject to direct Fed influence, impelled the central bank to use whatever lures it could to hold members. The Fed generally kept the cost of borrowing from the discount window below the cost of borrowing federal funds, which are unneeded reserves held by other banks.

The banks were leaving the Fed mainly because only Fed members until now had to post sterile reserves earning no interest. The new law requires all financial institutions—member and nonmember banks, credit unions, savings banks, savings and loans alike—to post reserves with the Fed, beginning in September, if they offer checking accounts or the equivalent. The bulk of the nation's 40,000 financial institutions are expected to offer some form of transactions account after Jan. 1, which is when the new law allows them to do so.

Readying for newcomers. In distributing to virtually all financial institutions what had been the burden of Fed members alone, Congress also expanded the discount-window borrowing privilege. The window access was technically extended immediately to [illegible]00 savings and loans, 400 mutual savings banks, and 1,000 credit unions that already offer transactions accounts. The law also added the 9,000 nonmember banks to the 4,000 member banks, which had held the exclusive right to borrow from the window. The Fed has entertained only emergency discount window requests from the new borrowers, but will accept more routine requests by sometime after mid-July.

Yet, the discount-window option looks anything but appealing, particularly for nonbank institutions. Regulations proposed by the Fed would require credit unions and savings and loans to try to borrow from their own systems' traditional lending facilities before coming to the discount window. Government credit union and S&L regulators, who were concerned that the institutions they oversee might wind up shopping for the best rates among the facilities, say they are happy with that provision.

The Fed's proposed regulations also limit discount-window borrowing, except for the most extreme circumstances, to maturities of a few days. Because S&Ls need longer loans to balance their long-term mortgages and other assets, "short-term borrowing is not something that's appropriate for the business savings and loans are in," says Dale Riordan, director of the Federal Home Loan Bank Board's Office of Policy & Economic Research. Banks have always faced administrative constraints against window borrowing. Fed officials say the difficulty of keeping tabs on three times as many banks means they will have to rely even more heavily on rationing credit through rates. "We cannot continue to rely as heavily as we have in the past on administration of the discount window," says Fed Governor Lyle E. Gramley.

A rationing surcharge. The Fed's proposed discount-window regulations further reserve the right to hit frequent borrowers with a surcharge along the

FINANCE

lines of the 3% tacked onto the 13% basic rate from Mar. 17 to May 6.

While the growing market for discount loans will complicate the Fed's rate-setting deliberations, it is so far unwilling to accede to proposals to link the discount rate to market rates and let it float up and down. "We would prefer a judgmental rate rather than a mechanical rate," says Fed Vice-Chairman Frederick H. Schultz. When market rates began dropping in mid-April, the Fed chose to maintain the discount rate. "With problems with the dollar, we didn't care to see interest rates go to nothing in a short period," he says. ■

CORPORATE FINANCE

Uniroyal pulls its belt even tighter

Carl Weese

Uniroyal's Crane: He insists the latest cuts will not crimp basic operations.

Uniroyal Inc., the financially troubled tiremaker, is retrenching—again. The new round of belt-tightening is critical if the company is to remain within the covenants of a revolving credit agreement signed just four months ago. Uniroyal's goal is to chop $50 million off its expenses during the next six months.

The key to the latest cost-cutting effort is getting the United Rubber Workers (URW), which signed a three-year contract with Uniroyal in June, 1979, to give back a major piece of its gains. Specifically, in an attempt to save nearly $20 million over 18 months, Uniroyal is asking its URW workers to accept a 12% or 13% reduction in wages and benefits for the rest of this year, with a restoration of just half the cut next year. By July 2, 5 of the 11 affected URW locals had approved the agreement, and it seemed headed for ratification.

In its retrenchment efforts earlier this year, Uniroyal signed an agreement with 21 banks to sell up to $100 million of its receivables, and another agreement with 22 banks for $150 million in revolving credit. The company also shut down two tire plants, to save $100 million.

Troubled customers. But the tire industry has fallen into a seemingly bottomless hole—passenger-car tire production was off 27% in the first four months of this year—and Uniroyal's orders from General Motors Corp., its largest customer, have dropped sharply. GM accounted for 16% of Uniroyal's $2.6 billion in sales last year. In June, GM made 32% fewer cars than in the same month a year ago.

As a result, Uniroyal, which just a few months ago was predicting it would make money on tires by late 1980, now makes no such claim. Indeed, after posting a $10 million operating loss on tire sales of $269 million in the first quarter, the company is scrambling to cut expenses. "We went through the donations, the contributions, the consultant fees, travel and entertainment," says William J. Crane, senior vice-president of finance. The company is working to bring down its accounts receivable and is tightening terms on some customers.

The company has also slashed salaried staff by 800, including 200 at its Middlebury (Conn.) headquarters, bringing the total number still at work there to only 650 from 1,200 just two years ago. But most important, it has impressed the URW enough with its plight to win the concessions. In a letter to the URW summarizing its position, Uniroyal said: "The failure to realize these [$50 million] savings could not only severely impact the future viability of the corporation, but [the savings are] also absolutely necessary to meet its obligations under the loan agreements or more severe steps would have to be taken." In exchange for union agreement, the company promised only that salaried and nonunion hourly employees in the U. S. would take the same cuts on July 1.

Credit terms. The credit agreement, which was also approved by seven insurance companies to which the company owes $230 million, not only prohibits Uniroyal from paying common-stock dividends, but under it the company's net worth may not fall below $486 mil-

Investment figures of the week

The week produced a marked backup in interest rates, both short- and long-term—the most pronounced advance in rates since the bond market rally began three months ago. Stocks simply churned during the week.

	Latest week	Previous week	Previous month	Year ago
Money market rates				
Federal funds	9.47%	8.62%	11.05%	10.66%
New three-month Treasury bills	8.15%	7.08%	8.04%	8.92%
New six-month Treasury bills	8.10%	7.11%	8.17%	8.94%
Three-month commercial paper	8.13%	8.13%	8.50%	9.70%
Stocks				
Price/earnings ratio* (avg. 1,500 stocks)	8.22	8.19	7.94	8.63
Dividend yield* (avg. 1,500 stocks)	5.34%	5.36%	5.46%	4.99%
Dow Jones industrial average	872.27	877.30	843.77	834.04
Standard & Poor's 500 stock index	114.93	115.14	110.51	101.99
Value Line composite index	124.23	123.93	119.57	112.90
Lipper growth mutual fund index	127.90	128.36	123.04	103.32
Average daily NYSE volume (millions)	37.8	37.7	36.3	35.5
NYSE blocks (10,000 shares and over)	517	522	476	473
Bonds				
New Aaa utilities**	11.00%	10.38%	11.38%	9.30%
New Baa utilities**	13.00%	12.25%	13.25%	10.25%
New Aa industrials**	10.50%	10.00%	11.20%	9.15%
U. S. governments (8½% issue of 1994-99)	10.07%	9.59%	10.23%	8.74%
Bond Buyer municipals (20-bond index)	7.76%	7.55%	7.73%	6.12%

All figures are as of Tuesday, July 1—except those marked*, which are from Friday, June 27, those marked**, which are from Monday, June 30, and the Bond Buyer index from Thursday, June 26, 1980.

Data: Salomon Bros., Standard & Poor's Compustat Services Inc., Lipper Analytical Services Inc.

lion at yearend. This means the company cannot afford to lose more than $20 million during the rest of this year. "We don't intend to lose that," says Crane, who predicts that the company's second-quarter loss will be "minor," at least in comparison with the $12 million net loss in the first quarter. For the period, Uniroyal's tire, chemical, and other businesses generated sales of $580 million.

"We're not running out of money," insists Crane, who says Uniroyal has taken less than $110 million of the $150 million revolving credit. And despite the doubts of some observers, he maintains that even the latest round of cuts will not crimp basic operations. The company's bankers so far seem confident. "We feel the [cost-cutting] program is a viable one," says Royall Victor III, senior vice-president of Chemical Bank, the lead lender.

But no one is ready to say that the latest Uniroyal retrenchment, which comes after a five-year sell-off of operations with sales of $800 million, will be the last. One local union officer, asked if these would be the only concessions the company would ask for, replies: "I'd like to think so . . . but who knows?" ▪

KMS's stormy return to mergers

After bumping along near bankruptcy for a decade, tiny KMS Industries Inc., of Ann Arbor, Mich., has jumped back into the acquisition race that helped make it a Wall Street glamour stock in the late 1960s. This time, its urgent goal is to find at least one merger mate with enough profit to utilize $22.7 million in fast-expiring tax-loss carryforwards and to balance its heavy dependence on government contracts and laser fusion energy research with more predictable—if more mundane—moneymakers. "We're not trying to be conglomerators," insists John E. Long, the Canadian oil and gas investor who bought control of KMS in 1978. "We just want some earnings and assets outside the energy business."

KMS's first major merger attempt under Long's leadership, however, promises to be a stormy one. On June 27, KMS announced it had offered to swap three of its over-the-counter common shares and one preferred share, which together some analysts value at $18, for each of the 1.6 million outstanding shares of Citation Cos., a Grand Rapids maker of plumbing fixtures and other items with 1979 sales of $55 million. The offer—well above the $10.75 price of Citation's American Stock Exchange shares—exceeds other buyout offers Citation has considered over the past two years, but the KMS deal is still getting short shrift. "The offer is absurd," storms Kenneth C. Case, Citation's chairman and CEO. "Whatever his [Long's] stock is selling for, it's overvalued. They're minnows trying to swallow a whale."

Even after a $1-a-share gain in recent weeks, KMS stock has been trading at around $4, less than half of Citation's price per share. The price was $83 a share in 1968, when KMS was a 26-division conglomerate with $52 million in revenues. But years of losses and massive investments in fusion research have left KMS with a net worth of only 5¢ per share as against Citation's $13. KMS earnings are running only about 4¢ per share a year on revenues of $11 million, and the company continues to operate with negative working capital—current assets minus current liabilities. But Long and his brother Patrick, who serves as KMS chairman and CEO, are orchestrating a major turnaround at KMS to put each of its divisions—fusion, synthetic fuels, optics, and data processing—on a profitable footing and to restructure its debt. In May, KMS paid off the remainder of $8 million in long-term borrowings a year ahead of schedule.

Dissident shareholders. Stock analysts say the runup in KMS shares stems from its synthetic fuels research, which makes the company a potential beneficiary of part of the $20 billion federal synfuels program signed into law by President Carter on June 30. Under contract with Texas Gas Transmission Co., KMS has been studying the use of high-powered lasers to fuse atoms of deuterium and tritium to generate cheap hydrogen and electricity from water. In theory, vast amounts of tar sands and oil shale could be turned into usable crude by pumping hydrogen into the ground to enrich it. "This is a high-technology company with no debt that is making money," insists John W. Winans, assistant vice-president with Kidder Peabody & Co., one of the 12 marketmakers in KMS stock.

Indeed, the prospect of getting into one of the few available pure plays in synfuels prompted a group of dissident Citation shareholders to urge Long to make an offer to Citation. A shareholder insurrection has been brewing ever since Citation management insiders and members of its founding families sold a 29% stake in the company in late 1978 to

Foreign exchange trader

	PERCENT					IN U.S. DOLLARS						
	U.S. TREASURY BILLS	CERTIFICATES OF DEPOSIT U.S.	EUROMARKET	SINGAPORE	EUROMARKET TIME DEPOSITS*	GERMAN MARK	SWISS FRANC	JAPANESE YEN	CANADIAN DOLLAR	FRENCH FRANC	BRITISH POUND	ITALIAN LIRA
SPOT	X	X	X	X	X	.5686	.6163	.004556	.8702	.2449	2.3665	.001190
THREE-MONTH	8.00	8.75	9.43	9.60	9.63	.5691	.6225	.004526	.8663	.2433	2.3232	.001189
SIX-MONTH	7.98	8.90	9.35	9.55	9.94	.5716	.6295	.004525	.8655	.2419	2.3002	.001187
ONE-YEAR	7.95	8.90	9.35	9.55	10.00	.5778	.6439	.004577	.8634	.2397	2.2745	.001175
BANK PRIME	11.50%	X	X	X	X	12.00%	7.13%	9.25%	13.25%	15.40%	18.00%	16.50%

Data: First Boston Corp., Irving Trust Co. As of July 1, 1980 *At London interbank offered rates

David G. Santry/July 14, 1980

Obstacles to Tamco's bid for City Investing

Tamco Enterprises, which on June 25 raised its offer to buy City Investing Co. to $32[illegible] a share from $30 a share, could face some formidable obstacles before it consummates the deal. Most of the potential barriers have to do with the $1.[illegible] billion in financing needed to buy the conglomerate, in what would be the biggest "leveraged buyout" in history. Beyond that, City, which turned down Tamco's first offer, has yet to accept the second. A Tamco spokesman, however, says that both sides are "friendly and talking."

So-called leveraged buyouts are precarious, tricky, and frequently unravel. Even when they work, they can take more than six months. That is because the buyers put up as little equity as possible and borrow the rest, often resorting to ingenious schemes. "Even if the financing appears all secure, the loan agreements are so complex and the lenders so numerous there is a high likelihood the deal can fall apart," explains one Wall Street arbitrageur. "You have several near heart attacks on every buyout."

Even though Tamco is confident it can get the money and has already spent $[illegible] million to buy 12% of City's stock, some Wall Street sources are skeptical. They doubt that Tamco, a real estate firm jointly owned by Lyman C. Hamilton, former International Telephone & Telegraph Corp. president, and Victor N. Goulet, a Chicago financier, has the lenders firmly committed. Indeed, Tamco admitted as much in the news release announcing its offer, which it said is contingent upon securing financing "on acceptable terms in amounts sufficient to effect the transaction at the proposed purchase price."

Scrounging capital. Sources say that Hamilton and Goulet have been searching desperately for money here and in Europe. One knowledgeable source says Tamco plans to put up $200 million in equity for City, $125 million of which it must get from outside. The $900 million to $1 billion balance would be borrowed and would be "very expensive money—subordinated debt and bank money," the source says. Annual interest on that debt would exceed $125 million. But City already has $1.6 billion of its own debt and paid a huge $60 million in interest in the first quarter of 1980.

"The only conclusion you can come to is that Tamco would have to finance a big part of the deal by liquidating chunks of City Investing," the source says. The Tamco spokesman confirms that that is the plan. Early divestitures would not only reduce debt but raise cash, he says.

Salable subsidiaries. Some sources wonder about the salability of many of City's main units. Wood Bros. Homes Inc., a homebuilder, a savings and loan association, and Guerdon Industries Inc., which makes mobile homes—all are depressed by the housing slump. Home Insurance Co., a property and casualty insurer, is City's biggest unit. Home generates a lot of cash, but is also cyclical. One source says Home has been cutting rates recently, which can be disastrous in inflationary times. "Underwriting losses, over $50 million last year, are apt to get worse as inflation lifts claims and costs, while competition is keeping rates on policies down," says Value Line Investment Survey about Home Insurance. Other candidates for sale include Motel 6 Inc. and its Florida real estate unit.

One source predicts that if the recession gets too bad, City's earnings could really suffer, as they did in the last recession (in 1975, City earned 59¢ a share). He says earnings could dip to $1.50 to $3 per share—compared with $5.07 per share last year. "The longer it takes for Tamco to close the deal, the worse City's earnings could get, and the harder it will be for Tamco to persuade lenders to put up the money," this source says.

If Tamco can pull the deal off, there will be at least two big winners. One will be Sharon Steel Corp., which owns about 12% of City and stands to make upwards of $40 million. The other big beneficiary will be City's 61-year-old chairman, George T. Scharffenberger, who owns 365,660 shares and has 385,520 share units, which are the equivalent of common shares awarded at an average price of $12.44.

Sources say City will probably accept Tamco's bid. City sold at about $13 a share before Sharon bought its stock last year and generated some interest in City as a takeover candidate. "If liquidation could have been done profitably, why would City's board sell out to Tamco instead of liquidating themselves—like uv Industries Inc. did so successfully?" asks one knowledgeable source. Without a deal, City's stock is likely to drop from its present price of $26.50 a share.

Squibb's wonder drug

Few developments cause speculators' blood pressure to rise more than talk of a new wonder drug. That is exactly what has been behind the recent volatility in the stock of Squibb Corp. (BW—Mar. 24). Fittingly, Squibb has a new drug to treat high blood pressure—also known as hypertension—as well as congestive heart failure. According to traders, Squibb's new drug, Captopril, is worth at least $5 a share to Squibb, which recently closed around $32 a share.

Squibb has high hopes for Captopril. The company's latest annual report contains a special section titled "Hypertension, A Silent But Deadly Affliction," which describes Captopril as a "remarkable milestone in medical research." The annual report also stresses that the worldwide market for hypertension drugs is expected to be $2 billion.

Limited usage? The question is: How much of the market can Captopril capture? Recently there have been reports that the drug may have some serious side effects. "Despite its effectiveness for treatment of hypertension, adverse effects may keep Captopril from being marketed or severely limit the indications for its use," says a recent issue of *Medical Letter*, a newsletter published in New Rochelle, N. Y. Specifically, the newsletter says several seriously ill patients taking the drug showed injury to their bone marrow. More common adverse effects are hives, fever, and temporary loss of taste, the newsletter says. "To what extent adverse effects will limit the usefulness remains to be determined," the newsletter concludes. M. Daniel Tatkon, editor and publisher of *InforMed*, a newsletter published in Sheffield, Mass., says: "Because of side effects, the market will not be nearly so large as expected."

A Squibb spokesman says the serious side effects appear in only the most critically ill patients, not among those with moderate hypertension, who constitute the largest potential market. He says that the company filed an application with the Food & Drug Administration in January and that it could market the drug here in 1981.

Peter Yates

KMS's Patrick Long: Seeking more predictable earnings.

Dayton-Walther Corp., a privately held truck parts maker that has about $230 million in annual sales. They sold out for the equivalent of $17 per share in cash and notes. However, it was clear from the start, admits Case, that the rest of the Citation shareholders would have to settle for stock in a new Walther-Citation Co., rather than cash, as part of a plan in which Dayton-Walther could "go public" by combining with Citation rather than by going through a costly stock registration with the Securities & Exchange Commission.

The Citation insider group sold its shares before winning a firm commitment of similar treatment for other shareholders. And when interest rates soared last fall and sagging truck sales sent Dayton-Walther's finances into a tailspin, talks aimed at cementing a deal for those other 70% of Citation shareholders fell through. Right after the KMS offer, Dayton-Walther announced that it had bought 16,600 more shares of Citation last April on the open market at prices from $8.50 to $9 a share—far less than it paid to insiders. This has made the remaining Citation holders worry about management acquiescence in a possible "creeping" tender offer and has been a cause of embarrassment to Citation directors. "Given the change that's occurred, it's not fair to the shareholders," admits Stephen R. Sawyer, a Citation director, and son of its former chairman.

Rejection? Case firmly denies any failure by management to exercise its fiduciary duties and remains confident that Dayton-Walther will eventually come through with an acceptable offer for the remaining shares. He therefore plans to recommend rejection of the KMS offer at a Citation directors' meeting on July 18.

But Richard A. Flaherty, a Grand Rapids stockbroker and Citation investor, charges that "the shareholders feel management has led them down the garden path." In fact, KMS claims to have indications of support from the holders of some 30% of Citation's stock. ■

1980: The year the forecasters really blew it

The old vaudeville team of Smith & Dale had a classic routine: Dale, as Dr. Kronkhite, examined Smith, who was complaining of various ailments. Kronkhite, after much probing, eventually asked, "Have you ever had this before?" Smith meekly answered, "Yes," and Kronkhite triumphantly shouted, "Well, you've got it again!"

Economists have had about as much success as Dr. Kronkhite in diagnosing the economic health of the U. S. economy. As late as April, the forecasters were still looking for only a mild downturn. Now that the nation is obviously in the throes of a severe recession, about all the economists can say is, "You've got it again."

MacNelly/Chicago Tribune/NYNS

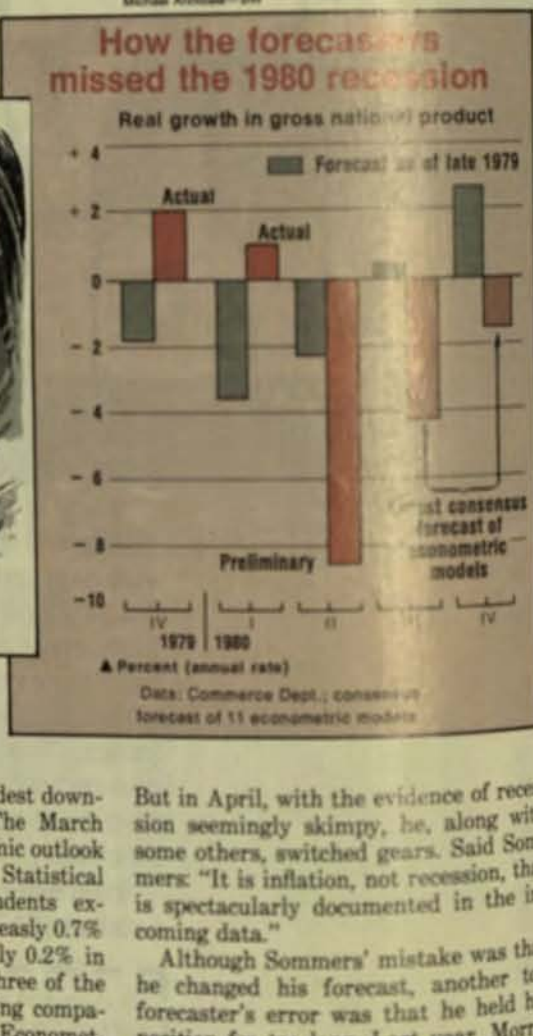
The forecasters currently expect a substantial recovery by the beginning of next year, with most of them looking for a V-shaped rebound. Given their track record, however, businessmen and consumers alike should heed the forecasts cautiously. Not only have the economists missed the intensity and timing of each of the seven postwar recessions, but their forecasts seem to be getting worse, even as their acceptance by policymakers and businessmen rises.

Paper tiger. It is little wonder that, in forecasting this recession, economists would come storming out of the starting gate early. After all, the 1974-75 recession caught them flat-footed. Indeed, some two dozen of the nation's top economists at President Ford's anti-inflation conference in Washington in September, 1974, were almost to a man unaware that the U. S. economy was in the midst of its most serious postwar recession. So in 1978 and 1979 most economists were warning of imminent recession—a recession that stubbornly refused to show up as consumers continued to spend in the face of soaring inflation. The majority of business forecasters late in 1979 were calling for a moderate recession—one they believed had begun already in the 1979 fourth quarter—that would continue until mid-1980. (Three months earlier they thought it had begun in the third quarter.) Real gross national product was forecast to decline less than 2% from peak to trough, and the unemployment rate was expected to peak at about 7¾%.

Moreover, the forecasters still were predicting a modest downturn in March and April. The March quarterly survey of the economic outlook conducted by the American Statistical Assn. indicated that respondents expected real GNP to decline a measly 0.7% in the second quarter and only 0.2% in the third. And in April, all three of the leading econometric forecasting companies, Data Resources, Chase Econometric Associates, and Wharton Econometric Forecasting Associates, were still expecting a decline in second-quarter GNP of less than 3%.

But when the recession did bite, it was not the paper tiger that had been forecast generally. The economy is well on its way to at least its second worst recession since the 1930s, and quite possibly even the worst. Real GNP plummeted at an annual rate of 8.5% in the second quarter, according to preliminary Commerce Dept. estimates. The unemployment rate shot up 1.6 points in April and May, to 7.8%, on its way to much higher ground, and factory layoffs are accelerating faster than in 1974-75.

The failure of the recession to appear as expected in late 1979 or early 1980 booby-trapped the few analysts who were on the right track. For instance, Albert T. Sommers, chief economist for the Conference Board, last winter was expecting a serious recession in 1980.



But in April, with the evidence of recession seemingly skimpy, he, along with some others, switched gears. Said Sommers: "It is inflation, not recession, that is spectacularly documented in the incoming data."

Although Sommers' mistake was that he changed his forecast, another top forecaster's error was that he held his position for too long. Last year, Morris Cohen, of investment bankers Schroder Naess & Thomas, was one of the few who correctly understood the strength in housing and capital goods, which prevented the economy from going into a tailspin in 1979. But in mid-March—when the economy was already in decline—Cohen forecast that in no quarter of 1980 would there be a decline in real GNP—a miss of spectacular dimension.

In 1979, Wall Street economist Henry

ECONOMICS

Kaufman of Salomon Bros., whose prognostications can move both money markets and stock markets, went against the crowd by projecting significant interest rate rises, rather than the declines most of his peers foresaw. He was, of course, right on the money. But in mid-April of this year he was still advising portfolio managers that "the fundamentals for a bond rally of cyclical proportions . . . are not yet in place." By then, however, the largest decline in interest rates in history was already well under way, and bonds staged a stunning rebound.

Slow to learn. Economists may have a ready and after the fact—perfectly reasonable explanation of where they went wrong. But they missed so badly this time because they failed to anticipate and analyze the implication of substantial shifts in economic policy and consumer behavior. Inflation, and the expectations that it would continue, accelerated rather than retarded consumer spending decisions, particularly of hard-goods and homes. And until early October, ample credit and capital gains from the sales of houses helped finance the increase in these expenditures.

The Federal Reserve Board finally stepped on the brakes on Oct. 6, clamping down on money growth. So interest rates really began to soar. Then in March, invoking for the first time the Credit Control Act of 1969 severely limiting credit, the Fed brought the five-year-long recovery to a screeching halt.

Moreover, economists were slow to recognize the cumulative inhibiting effect of progressively restrictive monetary policy. And even then they forgot what it could really do. Last December, optimist Cohen said that "as long as there is no money crunch, interest rates will have to go higher before they bite." But even when they did go higher, with the prime interest rate soaring from 13½% in early October to 20% in early April, he failed to modify his nonrecession scenario.

Although the recession proved elusive, now that it is under way, economists feel that they are on familiar ground. Recessions have roughly similar configurations, if different intensities. But today's forecasts of substantial recovery in 1981 are still hostage to uncertainties about economic policies and about consumer behavior. Although a tax cut appears certain, the amount, the distribution, and the timing have yet to be determined. At some point, monetary policy will turn easier; but the critical questions are: How soon, and how easy. And consumer behavior is no easier to anticipate than it has been in the past. Under those circumstances the best thing that businessmen can do is take their order books and the economic news more seriously than they take their economists. ■

Personal business

Edited by Donald H. Dunn / July 14, 1980

The unsung travails of losing traveler's checks

It all seems so simple in those TV commercials: When people lose a batch of traveler's checks, they go to a conveniently located office nearby for a quick refund. But what if the problem is more complicated? As, for example, when a woman traveling on business recently to a Latin American city had her purse rifled while she watched a holiday parade. Gone—all at once—were her traveler's checks, cash, credit cards, return airline ticket, and passport.

The ensuing three-day delay in her trip drove home some lessons you'll want to heed on vacations or business journeys to other countries.

Although it might be convenient—especially for frequent travelers—to keep documents, tickets, and money in a single place, separate them instead. "People are often afraid to leave tickets or their passport in a hotel room, because it could be robbed while they are out," says a State Dept. official. "So they carry everything with them in a pocketbook or wallet. If it's lost, or a pickpocket or purse-snatcher strikes, everything goes."

For maximum security, take several large self-addressed envelopes along when you travel. On arrival at a hotel, seal your passport, tickets, extra cash, checks, and other valuables in one. Have the desk clerk lock it in the hotel safe to be returned when you check out.

Make photocopies of passport, tickets

You can do more to protect yourself in advance. Before leaving on a trip, make several photocopies of your passport, tickets, first and last travel checks in the batch purchased, credit cards you will carry with you, and your driver's license or other identification. (If a copier is not available, write down the document numbers and make a carbon.) Put one copy in the bottom of your suitcase, and leave another at home with a secretary, relative, or friend.

Having adequate identification is the key to getting a lost or stolen passport replaced quickly. If yours is stolen, report it first to the local police. Do not be surprised if you are referred to an Interpol office that looks out for illegal passports. In either case, get a copy of your theft report and take it to the U. S. embassy (in large cities) or consulate (in smaller ones). The offices close on weekends and observe official holidays of both the U. S. and the host country, but a duty officer is supposed to be on hand at all times.

With proof of citizenship—or, best of all, your passport number and date and place of issue—you're in good shape. A limited passport can be issued for you to continue your travels or return to the U. S. (A tip: If you have new passport pictures taken before you set out on your trip, spend an extra dollar or so and get four copies instead of the usual two. Take the spares along in your suitcase to speed things up if a new passport has to be issued.) If there is any question about your identity, figure on an overnight wait while the embassy or consulate cables Washington and the files are searched.

If you are in a hurry to get home, you can ask the embassy to cable the immigration office at your port of entry. You will pay a $25 fee for arriving without a travel document.

Replacing a lost or stolen airline ticket is more difficult and costly. Because tickets are negotiable like cash, you will not get a duplicate free unless you (or your stranded youngster) can prove economic hardship. Most likely, you will buy a new ticket, file a refund application, and then have to wait from a month to a year to be reimbursed for your loss.

You will have less trouble if you bought your own ticket from the airline, rather than through a travel agent. Your name and number will be in the computer, and flight personnel can guard against a fraudulent user. This process—called blacklisting—is not as easy if tickets are bought in a travel agent's name. And if a thief uses your ticket or cashes it in, you get no refund.

Pay for tickets by check or credit card, not cash. You'll have proof of purchase, along with numbers and dates. If you pay cash, the airline can track down the numbers in its computer—if you know when and where the purchase was made—but it takes longer.

Processing a refund application carries a service charge of about $5 to $20, depending on the airline. The cost is deducted from your refund.

The services vary for emergency cash

The competition in traveler's checks means you might get faster replacement service from one issuer than from another. Overseas, you can get a full refund—assuming you can produce your check numbers—on American Express checks from one of its offices during business hours. If the office is closed, an Avis car-rental branch will give you $100 to tide you over.

Thomas Cook, whose checks are free at the travel agent's offices and some banks, has a similar arrangement abroad with Hertz, which will provide an emergency replacement of up to $250. Visa checks require a bit more trouble, if you can't find a local bank that handles them or if it is after banking hours. You will have to call collect to the U. S.—415 574-7111—and an operator on duty around the clock will direct you to a local agent who handles emergencies.

BankAmerica and Citicorp traveler's checks can be replaced abroad at banks or branch offices handling them only during business hours.

And if your credit cards vanish, your best bet is to call a friend back home. He or she can phone your loss to the appropriate bank or card company, which will cancel the cards and mail replacements to your home. In some cases, the new cards will have arrived before you get back.

The U. S. Olympic team's alternate showcases

The 22nd Olympic Games open in Moscow on July 19 without U. S. participation, but you can see some of the men and women who would have been on hand to represent us compete this summer in several athletic meets around the nation. Track-and-field fans, for example, can catch the top amateurs on July 16-17 at Franklin Field in Philadelphia. If you like archery, the national championships are at Miami University, in Oxford, Ohio, on Aug. 4-9. Swimmers will compete in the U. S. Invitational meet on Aug. 14-17 in Honolulu, and bicycle races are planned in September in Los Angeles.

Meanwhile, fund-raising has dropped off substantially in the wake of the boycott, and F. Don Miller, executive director of the U. S. Olympic Committee, has his fingers crossed that things will improve. To get teams ready for the 1984 Olympics in Los Angeles, the committee has an appropriation of $10 million from the government. But it is on a matching basis: For every $1 of that amount it collects, the public must contribute $2 before Oct. 1.

To make a tax-deductible contribution, send your check to the U. S. Olympic Committee, Box TR, Colorado Springs, Colo. 80950.

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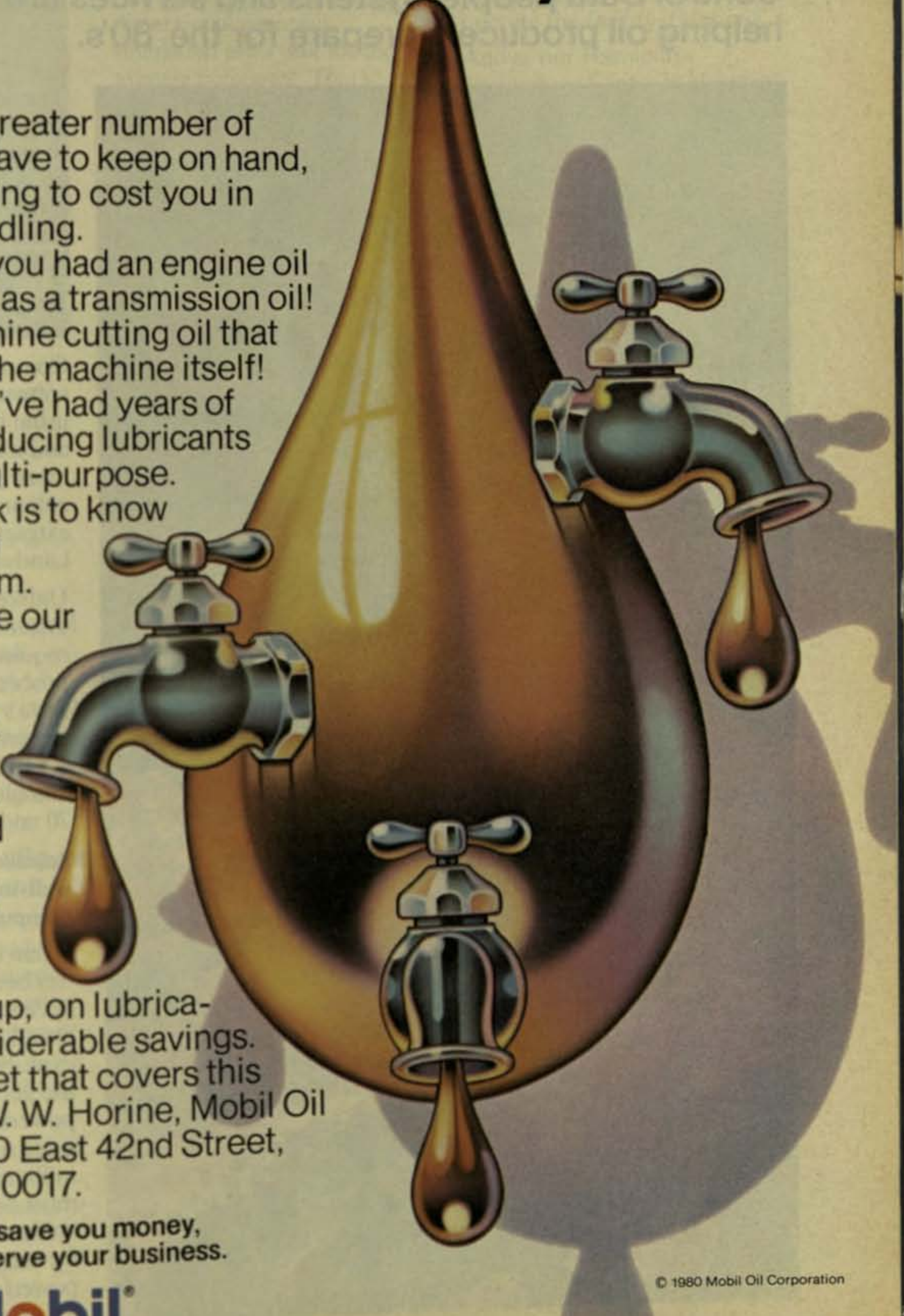

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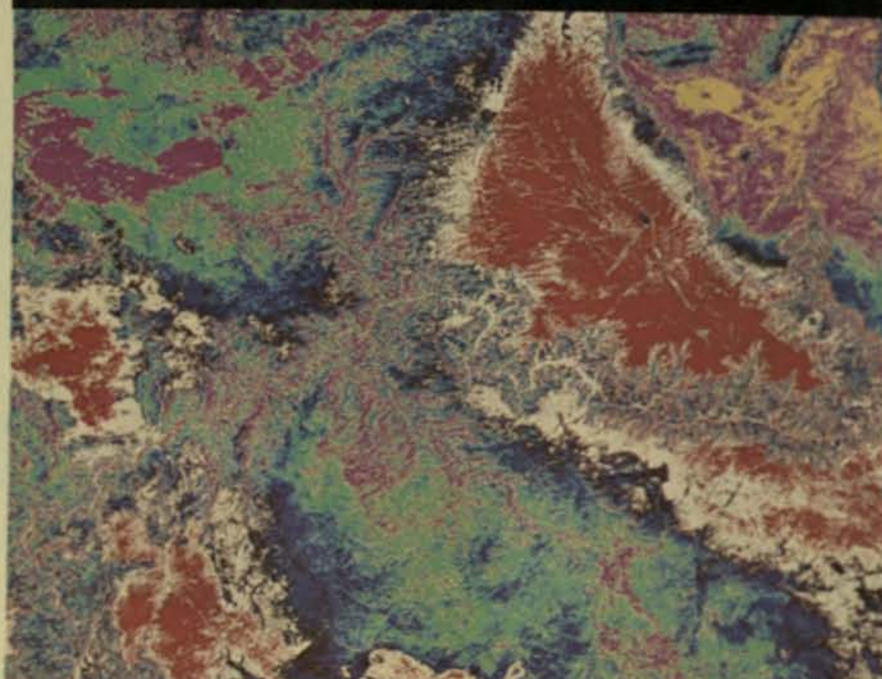
Control Data people, systems and services are helping oil producers prepare for the '80's.

Above, the Grand Canyon, as seen by Landsat and XPLOR. Digital enhancement techniques have been applied to show greater surface detail.
Below, multi-spectral or thematic mapping algorithms in XPLOR have been used to help identify areas of similar spectral character. These algorithms will be used to classify soil/mineral types with Landsat D.



The search for and development of new petroleum resources to meet the world's growing demand for energy has always been a risky business—but Control Data technology is helping improve the odds.

Image processing to cut the cost of exploration

Control Data's XPLOR™ software is a tool geologists are using in their search for oil and minerals. It consists of more than 40 different image enhancement algorithms to extract information from Landsat and aerial photographs.

Unlike many image processing systems, XPLOR doesn't require a special dedicated processor. It runs on Control Data's CYBERNET® data services as well as our newest CYBER 170 Series 700 systems and older CYBER 170, CYBER 70 and CDC® 6000 systems.

Seismic processing and well-logging—big jobs for big computers

When a likely exploration area has been identified, the decision as to where to drill is usually established by seismic exploration techniques. Here the geophysicist must rely on powerful computer tools—since a dry hole can cost millions. Huge amounts of data must be sifted, edited and analyzed. Carefully. It's a job for the largest and most powerful computers. That's why Control Data mainframes

to the Petroleum Industry

and array processors are used so extensively in the industry and why our vector oriented super computers, the CYBER 200 series, are attracting so much attention.

As the well is drilled data is collected by special instruments to determine the presence of oil and gas. Control Data's CYBERNET® data processing services offers special programs that are being used to generate "well logs" interactively and help determine which oil and gas zones to produce.

Simulation is the key to efficient production and operation

Another computer tool, simulation, is used to model the reservoir. With this model, the petroleum engineer can better estimate the reserves in place as well as the most efficient method of producing the oil and gas.

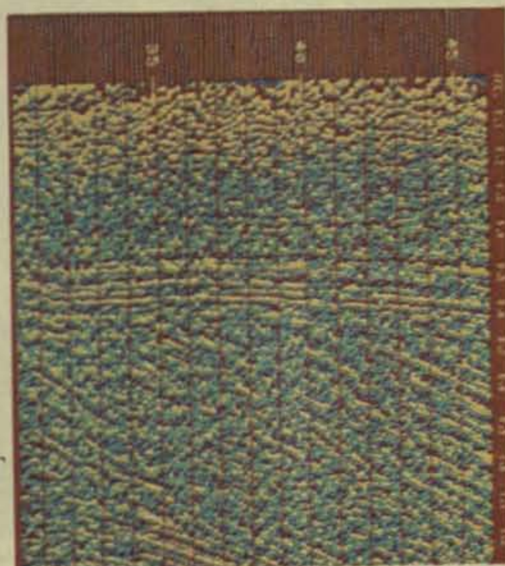
When easily obtainable oil has been extracted, a secondary recovery model can be used to determine where and how much steam, water or gas should be injected into the field to enhance recovery.

But creating a two- or three-dimensional reservoir simulation is no task for the average computer. That's why several of the world's largest oil fields are modeled on Control Data equipment. Whether on-site or through CYBERNET Services, these computers deliver large-scale computing power that's both economical and efficient.

Complete packaged systems and experienced people for all phases of oil exploration and production

We also package our CYBER 170 Series 700 hardware with software developed by some of the industry's leading consultants. One of our exploration packages, for example, is built around CGG/GEODIGIT gravity, magnetics and seismic software. One of our production packages uses FRANLAB Consultants' reservoir simulation and engineering programs. And our new image processing package, using Control Data's own INTERSYS/XPLOR software, helps companies enter this field with a minimum investment. All packages are fully supported—we can install, train and even operate the facility if desired.

And at our Petroleum Technology Center in Houston, we've assembled a staff of petroleum specialists. Through consulting, training and technical assistance, they're helping apply the best and latest computer technology to the needs of our petroleum customers.



Much of the world's seismic data processing is done on Control Data equipment. In the seismic section above, a pseudo-color algorithm of XPLOR was used to facilitate interpretation of subsurface structural information.

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Addressing society's major unmet needs

The glassmakers are trying to cool it

Glass is still made in the same old way that it has been for 7,000 years—sand and other materials are melted together at blistering temperatures to turn out what is in reality a supercooled liquid. Off and on for years, however, researchers have looked for new ways to produce glass at lower temperatures, since energy is the most costly component of glassmaking. One approach that worked produced glass by chemical reactions in water-based solutions, but the chemistry was complex, and the process proved far too costly to compete with conventional methods.

Now there is a resurgence of interest in this "sol-gel" process, partly because recent advances have made it more practical and also because it looks like the answer for turning out the types of specialized glass needed for new high-technology applications in such areas as solar cells, fiber optics, and lasers. Researchers see important new markets appearing for optical coatings on materials that cannot withstand high temperatures. They are also exploring ways of making ultrapure, superstrength glass and even producing glass from chemical elements that cannot be made into glass by conventional technology. "A lot of people were not paying attention to [the sol-gel process] until the emergence of high-technology applications," says K. S. Mazdiyasni, an engineer working in this area at the Air Force Materials Laboratory in Dayton.

The low-temperature way. Instead of fusing the elements of glass with heat, the low-temperature process begins by turning these chemicals into water-based gels. The molecules that will become glass are bound to a water-soluble polymer similar to a plastic. As the gel dries, molecules detach from the polymer and react to form glass. When the gel is heated to 300C to 500C—a temperature far lower than the 1500C or more needed for conventional glassmaking—the remaining water and the other elements that make up the polymer are driven off. "We're starting at the bottom and working our way up," says Bulent E. Yoldas, a scientist at Westinghouse Electric Corp., who has continued the work in this area that he began at Owens-Illinois Inc.

Yoldas and a handful of other researchers have now overcome a major obstacle to the widespread use of the sol-gel process. They have managed to produce glass in a solid form. Previously, the best they could do was to produce a glass powder that had to be melted together at high temperatures to form solid pieces. And Yoldas has found a way to achieve similar results with elements other than silicon, the element in sand that is used to make conventional glass for windows and glassware.

The ability to make glass in solid form through low-temperature chemical reactions may open the way to a broad range of applications in optical coatings. The resulting gel can be applied by either spraying or dipping. And when the water and other chemicals are driven off by heating to the 300C range, an optically clear layer of glass remains. "The real breakthrough is in liquid application methods," notes Yoldas. "Optical coating is the name of the game, and it's suitable for mass production of many types of shapes."

Westinghouse's Yoldas: Using the new liquid glass as an antireflective solar-cell coating.

Antireflective coatings. Already, Westinghouse is testing the liquid glass as an antireflective coating for solar photovoltaic cells produced by its Advanced Energy Systems Div. Without such coatings, solar cells reflect almost 40% of the light that hits them, vastly reducing their capacity to convert that energy into electricity. Until now, solar cells have been coated by a process known as sputtering, in which glass is vaporized by an electron beam in a vacuum, and it falls as a fine mist on the solar cell being coated. That process is costly, however, and not particularly suited to mass production. It costs about 20¢ for each rated watt output to sputter on the coating. With liquid glass "we have lowered the cost to less than a penny a watt," Yoldas says, even though materials cost as much as $3 per lb. vs. a few pennies per lb. for conventional glass.

While solar cells seem to be a hot candidate for the new glasses, other applications are being actively developed. Battelle's Columbus Laboratories, for example, has developed a similar glassmaking process and is using it to coat the glass lenses for lasers to be used in an experimental nuclear fusion project at Lawrence Livermore Laboratories, a government-funded research installation in Livermore, Calif.

Later, the low-temperature process may be capable of producing the exotic glasses for making the lasers themselves. Such glasses are distant cousins of common window glass but contain rare elements that help the laser to amplify light. Producing such specialized glasses is a complex and costly job. With sol-gel technology, researchers believe that they can do a better job of distributing those elements and maintaining the purity of the raw materials. "Sol-gel gives you more control," says one researcher. He and his cohorts also believe that some elements can now be added to glass that could not be included in conventional glass because they are altered by high temperatures.

Higher purity. The new process also shows promise for producing the high-purity glass required for fiber-optic communications systems. Getting rid of impurities is critical, because they reduce the ability of the fiber to carry light over long distances. To get the highest purity now requires a costly process called flame hydrolysis. Here the material is passed through a flame as a gas, and the fine precipitate that is formed is collected and melted into glass.

But flame hydrolysis is wasteful of the pure silicon oxide (silica) used as the basic material. "I think it's safe to say that 50% of the silica is wasted," says Robert D. Shoup, a research supervisor in the glass ceramics department at Corning Glass Works. He sees this approach being eventually replaced with sol-gel. One place to produce that ultra-

RESEARCH

pure glass may be in space. Battelle researchers are planning to use the sol-gel process to produce blanks for drawing optical fibers in the weightless environment of space once the space shuttle becomes operational. The joint project is with the Jet Propulsion Laboratory in Pasadena, Calif. Another fiber optics program is now under way at West Germany's Jenaer Glaswerke Schott, which holds some of the early patents on low-temperature glass.

A new low-heat process promises a way to turn out high-technology products

Because sol-gel achieves such an even distribution of the chemicals in the glass, turning out high-strength fibers for reinforcing plastics and other composite materials is another possible application. The reason is that the more homogeneous the glass is, the stronger it becomes.

Researchers are also intrigued by the possibility of producing glass from elements that cannot now be made into glass. While most glass, such as that in windowpanes, is made from silicon sand, the oxides of some metals are made into glass for specialized applications. But many of the most attractive elements have not been made into glass because they crystallize at high temperatures. This is a job that could be done by chemical glassmaking. "We have transcended the restriction to silica," claims Westinghouse's Yoldas. "We are producing materials that we know nothing about, and some of them might have properties that are uniquely suited to some technological application." So far, Yoldas has made glass from 20 elements and believes that he may be able to double that number.

Criticism. Not every company experimenting with sol-gel technology is as optimistic as Yoldas and Westinghouse. Owens-Illinois, for one, started working on the process in 1967 but cut back these efforts because of the high cost. "We never found a way to make money on it," admits Daniel R. Stewart, director of glass and ceramic technology. But that was before it became apparent that sol-gel made sense in the emerging high-technology applications. Even Owens-Illinois concedes that it still has a "modest" research effort under way.

"We are looking for applications that we can tool up for beyond the glass and beaker stage," says Richard B. Grekila, manager of the ceramics department at Westinghouse's research and development center in Pittsburgh. "I am confident that we are going to find commercial applications within the next few years," he says, "and by that I do not mean by the end of the decade." ■

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Rippling troubles from the farm belt

At the start of the last recession, the nation's farmers quietly socked away oil-like profits without much public embarrassment over high food prices. But in this recession, farmers are hurting badly. This year net income of U. S. farms will probably fall by one-third to around \$22 billion—the sharpest one-year drop in more than half a century.

Real farm income could sink to no more than \$9 billion in 1967 dollars, lower than at any time since the early 1930s. This already has led to invalid comparisons with the Great Depression—invalid because in the 1930s farm income was divided among more than 6 million farms, three times the present number. Still, the return on farm assets this year will plunge to about 3%, the lowest level in two decades.

Pinched suppliers. The effects of that return are already being felt by farm suppliers. A year that was expected to bring only a modest decline for farm equipment manufacturers has in the last few months become a rout. Tractor unit sales alone are off 27% in 1980, and the industry has recently been hit with sizable layoffs. Fertilizer producers, which end their fiscal year on June 30, have seen many of the sales gains racked up in the first half disappear in the second half. Perhaps the most dramatic impact has been on rural bankers. At the beginning of the year they were complaining about a dangerous liquidity squeeze. But because of an unusual reduction in loan demand by farmers this spring and a major change in the relationship between farm loan rates and money market rates, the rural banks suddenly have access to more money than they know what to do with.

Many farmers, eager to capitalize on election-year politics, would like to pin most of the blame for the quick change in their fortunes on President Carter's January embargo of 17 million tons of grain bound for the Soviet Union. To be sure, corn and wheat prices have fallen 9% and soybeans 22% from the peaks they hit last year, but an embargo on 6% of the nation's grain production is probably not the major reason for this. Government grain purchases and stepped-up storage programs have offset most of the embargo's impact, reducing its effect on farm income to only about \$1 billion. Even with the embargo in force, the Agriculture Dept. expects farm exports this year to increase 18% to \$38 billion. "I put the Russians in the category of more interesting than important," says Agriculture Secretary Bob Bergland.

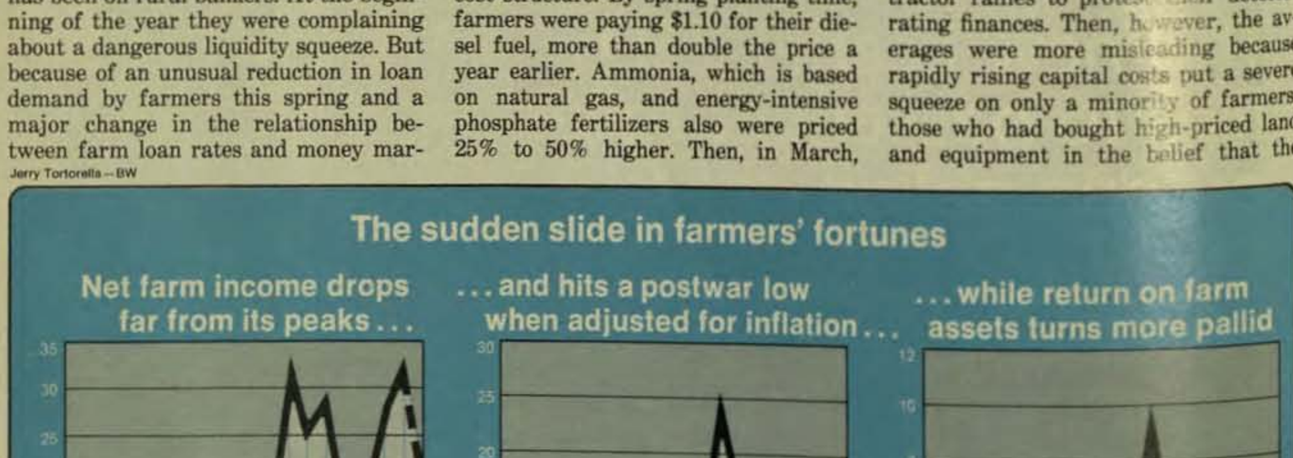
Costs, rather than prices, trigger the squeeze. Income is down one-third

Record crops. The real squeeze on farmers is coming not from prices but from costs. Last year's doubling of crude oil prices totally revamped agriculture's cost structure. By spring planting time, farmers were paying \$1.10 for their diesel fuel, more than double the price a year earlier. Ammonia, which is based on natural gas, and energy-intensive phosphate fertilizers also were priced 25% to 50% higher. Then, in March, when most farmers look for production loans, interest rates even at rural banks had climbed to 18%—twice the level of the year before. During previous periods of tight money nationwide, country banks offered much cheaper rates because they did not depend on money markets for their funds, relying instead on the normal flow of deposits. But by the time the latest squeeze took hold, the rural banks had issued truckloads of the new six-month money market certificates, which locked them into cost-of-funds rates of up to 15%.

Even though farmers quickly cut back on fertilizer and fuel use, as well as on their borrowing, their total production costs will increase 14% this year, and on some grains the increase will be closer to 20%. Far from offsetting those increases, average prices for all farm goods are running 6% below the past year, putting many crops in the red. One study pegs the average cost of growing this year's wheat crop at about \$4.60 per bu., nearly \$1 above wheat's current market price. And another estimates that the cost of growing corn now averages \$2.65 per bu., about 25¢ above the market price.

Similar average cost-price ratios were cited three years ago when angry farmers held a series of widely publicized tractor rallies to protest their deteriorating finances. Then, however, the averages were more misleading because rapidly rising capital costs put a severe squeeze on only a minority of farmers: those who had bought high-priced land and equipment in the belief that the

Jerry Tortorella—BW



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and in April, normally the month of strongest demand, tractor sales tumbled 47%—their steepest one-month decline.

But the equipment makers are not being affected evenly. In May, Deere laid off 2,000 of its farm equipment work force, while Massey-Ferguson Ltd. announced that it would close all of its 11 North American plants for two months beginning in September, idling some 7,000 employees. Both Massey and Deere are now stuck with receivables that have swollen in the last year by 48% and 30%, respectively.

International Harvester Co., on the other hand, started fiscal 1980 in the middle of a six-month strike by the United Auto Workers that had shut down all of its domestic farm-equipment operations. The strike led to a $479 million loss in the first half, and it forced Harvester to load up on additional long-term debt. But because it also slashed the company's inventories just before the collapse of the farm equipment market, the strike is paying some dividends to Harvester now: Its receivables and market share have held steady, and Harvester will remain at full production this year even if the market does not improve. "Our competitors were shipping like mad, hoping to beat us during the strike," says Stanley F. Lancaster, general manager of IH's North American Farm Equipment Group. "But we achieved with a strike the inventory reductions they are now achieving with layoffs. I wish I could say we planned it that way."

Fertilizer producers. Farming's troubles have also destroyed the hopes of fertilizer producers that their 1980 fiscal year would bring a spectacular recovery from the financial disaster that began two years ago when a three-year expansion program resulted in excess capacity. Fertilizer profits will still be up more than 50% for the year, but the industry's return on investment probably will be no more than 10%.

So far, reduced demand has been felt mostly by phosphate and potash manufacturers. Despite a nearly 20% gain in the first half, phosphate sales are now expected to be off about 5% for the fiscal year, and prices for the fertilizer have dropped 15% in just the last two months.

The decline in demand also has contributed to a rift between phosphate producers, many of which export their products through a powerful group called the Phosphate Chemical Export Assn. The dispute began last February, when President Carter ordered an embargo to prevent Occidental Petroleum Corp. from shipping to the Soviets 1 million tons of phosphoric acid, an intermediate chemical used in making phosphate fertilizers. Oxy, a member of the group, had been allowed to make the deal with the Soviets on its own, and those shipments of acid were not part of the export allocation that the association assigns its members.

More federal help? Initially the group agreed to try to sell the embargoed acid, even though some members, already worried about the market's downturn, began complaining that Oxy was getting preferential treatment. When Oxy also started selling the phosphate outside the organization, it brought furious protests from such members as W. R. Grace &

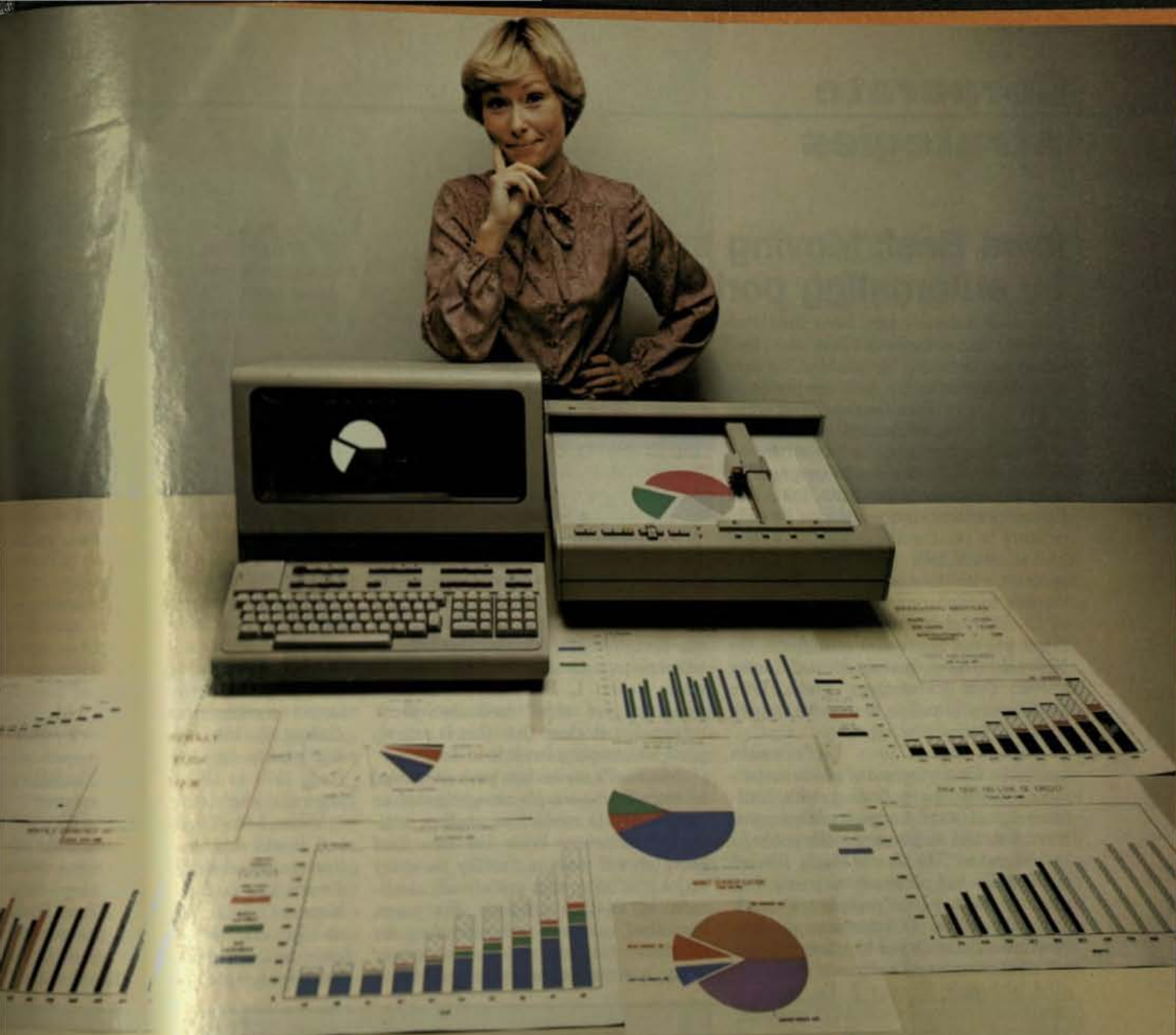
Machinery and fertilizer suppliers are hard hit. Banks swimming in money

Co. Eventually the dispute led to Oxy's resignation from the group on June 17.

How severe next year's downturn will be on any of the major farm suppliers now depends on how fast commodity prices rise to cover the farmers' new cost plateau. On that score, there are factors running in agriculture's favor. Having already put two record grain crops back to back, the probability that farmers will have another record harvest in 1980 is somewhat less than it was last year. Also, world grain stocks are down 12% from a year ago, and at present consumption rates, they amount to only a 55-day supply.

Short of massive federal aid, farming's profitability rests with unpredictable market forces. And there is growing certainty among agricultural economists that a good many U. S. farmers are in no position to weather a repeat of the current fiscal year. Many survived the 1977 farm recession by living off fat profits made in the early 1970s or by going deeper into debt, an option that was then wide open because farmers' equity in their land was rising so fast. But now growing numbers of farmers have borrowed all they can on their equity.

As a result, many experts now believe that farming needs a good recovery next year to keep the 1.5% average annual decline in the number of U. S. farms from doubling in 1981. In fact, forced liquidation may already have started in the corn belt, the region hardest hit because of its dependence on grain and livestock. Minnesota banker Peterson notes that as many as five of his bank's 360 farm customers may be forced into auction this year, compared with only one in the last decade. "A lot of farmers have stayed in business because they could always find credit," adds Vernon L. Peckham, a senior vice-president for Republic National Bank of Dallas. "Now they don't have cash flow to service all their debt, and there isn't a rate a bank can charge that can cover that type of risk." ■



Corporate strategies

Iowa Beef: Moving in for a kill by automating pork processing

Just over a decade ago, Iowa Beef Processors Inc. revolutionized the beef slaughter industry by establishing low-cost, highly efficient packing plants in the heart of rural cattle-producing areas. By using new, automated meat-cutting and packaging techniques—with unskilled, often nonunion labor—and by slashing transportation costs, Iowa Beef Processors (IBP) stampeded over its competitors to become the largest U. S. beef packer, with 19% of the market. Not content with that share, the company intends to capture as much as a quarter of the market by 1984. But even those plans are not aggressive enough for the Nebraska-based management. Having proven that its strategy works, Iowa Beef is now planning to attack the pork industry with equal vigor.

A lender's dream. Iowa Beef's moves come at a time when many of its competitors, which are operating with antiquated plants and staggering labor costs, have watched earnings steadily erode in recent years. The Fresh Meats Div. of Swift & Co. has performed so poorly that on June 26 its parent company, Esmark Inc., announced its intentions to close down certain units and to attempt to sell off what remains as a separate company. And although Armour & Co. made a profit last year, Gerald H. Trautman, chairman and chief executive officer of parent company Greyhound Corp., told shareholders in the annual report that the subsidiary has "a long way to go to generate earnings proportionate to their asset base."

This is hardly a problem for Iowa Beef. Last year the company registered earnings of $42.7 million on sales of $4.2 billion, its ninth consecutive year of earnings gains and an outstanding performance in an industry where margins are traditionally slim. And Iowa Beef boasts a 22% five-year average aftertax return on equity and a 17% five-year average increase in earnings per share. A new $96 million beef facility, which starts up next December in Kansas, will be paid for out of cash flow. And its $300 million capital spending plans for the next five years could well be financed in the private debt market. With a 3-to-1 ratio of current assets to current liabilities and a 0.2-to-1 ratio of debt to equity, Iowa Beef is a lender's dream.

Iowa Beef is taking that strength into the $20 billion pork-processing industry. The company, which currently has a small "custom-kill" operation that supplies pork to Armour, now plans to expand these operations with a new plant costing some $100 million—a move that is sending chills through the pork industry. Although some larger producers have modernized, much of pork processing today is in the same state as beef processing in the 1960s, when Iowa Beef entered the market: It is rife with high-cost, labor-intensive plants, some dating back 60 years and located in areas where agriculture is no longer dominant. "Pork has been there for 25 years waiting for someone to automate and upgrade," declares Robert L. Peterson, Iowa Beef's president and chief executive officer, who makes it clear that this is exactly what his company intends to do.

Iowa Beef's moves into pork are fueled by more than a simple recognition of an opportunity to modernize another antiquated industry. With its new beef plant, it will have a facility in every major producing area not already dominated by another company. For years, Iowa Beef has been under scrutiny for antitrust violations, and it is even now facing a series of lawsuits brought in Dallas by a group of small cattle feeders. In Washington, meanwhile, legislation has been introduced to restrict any producer from controlling more than 25% of the beef market—the share Iowa Beef will approach when it completes its new plant. So while the company plans some growth through such means as offering portion-controlled beef to supermarkets, there is a strong awareness in the company that it cannot continue to grow in beef at the rate it has in the past.

Lean on bacon. Pork processing thus appears to be a natural diversification. But Iowa Beef is likely to wait until its new beef plant is operating at full capacity in 1984 before it goes heavily into the new business. By then the company expects the pork industry to be even more consolidated than it has become during the last five years. With smaller processors dropping out or being swallowed by larger companies and with old plants closing up, the number of pork-processing plants in the U. S. dropped 15% from 1974 to 1978, while the number of hogs slaughtered remained constant.

When Iowa Beef enters the pork market, it will find itself up against the old-line meatpackers it locked horns with a decade ago in the beef industry—Oscar Mayer, Geo. A. Hormel, Wilson Foods, and Armour. But its competitors in pork have one significant advantage. Unlike most beef, which is slaughtered and sold

Swift gets an order: No more fresh meat

On June 26, Esmark Inc.'s president and chief executive officer, Donald P. Kelly, made good an earlier threat: He announced his intention to close three meatpacking plants and sell off the nine remaining plants of subsidiary Swift & Co.'s Fresh Meats Div. Less than two years before, Kelly had put Swift on notice that he expected sharp improvements or the ax would fall. By the end of 1979, however, those improvements had not materialized. Although sales, at $4.5 billion, were up 11.2% over 1978, operating earnings had plunged 34.6% to $23.6 million. Kelly hotly criticized this performance, and shortly thereafter, Swift's then-president, William S. Watchman Jr., resigned.

The decline at Swift came despite furious efforts to speed up a decade-old plan to close high-cost, noncompetitive plants. But the company's labor costs continued to soar, and the president of the Fresh Meats Div., John A. Copeland, now says that the company often gave in to union contract demands rather than take a strike that would spill over onto Esmark's bottom line. Indeed, in announcing his plan for Swift, Kelly pinpointed exorbitant labor costs as the obstacle Swift had been unable to overcome. "Time and again we went to the union and asked for concessions to make us competitive," Kelly explained. "It's abominable that Swift had to close as many plants as it had to."

Fourth place. Esmark will retain Swift's extensive line of processed foods—such as Butterball turkeys and Sizzlean pork breakfast strips—because they fit into Esmark's plan to concentrate on strong brand-name consumer products. But the demise of the fresh meat operation marks the end of an era for the 125-year-old meatpacker, the industry leader in beef until the mid-1970s. Since then,

Edward Porter

IBP's Peterson: [illegible]rk has been there for 25 years waiting for someone to automate."

as a commodity. [illegible]0% to 75% of the hog is processed into products such as bacon, hot dogs, and cured hams, and sold under well-known brand names. "IBP knows how to keep costs down, but it doesn't have a well-known brand," says Patrick J. Lub[illegible], vice-president at Oscar Mayer & Co. "They will have to spend a lot of money going up against our bacon or Hormel's ham."

Iowa Beef is not fazed by the prospect of significant spending. With the company's financial clout, Peterson says Iowa Beef could either purchase an existing pork product brand or hire a marketing team to start its own. Many observers believe that the company will take this route simply because margins on products such as ham and hot dogs are three times more than on fresh meat. But another route under consideration is a custom-kill operation that would also provide processed products as a private-label manufacturer for supermarkets and other packers.

If Iowa Beef decides to go into pork with a custom-kill operation, it stands to benefit from the same strategy that made its beef operation a success. That strategy developed out of founder Currier J. Holman's notion that there were more efficient ways to process and market beef. After slaughter in rural plants, Iowa Beef ships compact "boxed beef" cuts to be carved into retail portions at supermarket warehouses, disposing of cattle byproducts locally. By eliminating the truck space and diesel fuel required to ship carcasses, Iowa Beef figures that it cuts transportation costs by 25%.

Iowa Beef's most significant savings by far, though, have been in labor costs, which several analysts estimate to be as much as 40% below some of its competitors. The company has managed to keep unions out of 5 of its 10 plants. And although many competitors in recent years have adopted some of Iowa Beef's methods and closed down or modernized old plants, all are still tied to the master contracts with the United Food & Commercial Workers Union, which includes meat cutters.

Six-day weeks. Iowa Beef has faced eight strikes since 1965, including a 14-month strike at its major packing plant in Dakota City, Neb., which ended in November, 1978, with the union settling for less than the company's initial offer. Peterson is prepared to fight now to keep unions out of the company's pork plants. "No is a popular word at IBP," he boasts.

Iowa Beef's reputation for toughness in its labor dealings is reflected in its equally tough demands on its corporate staff. Salaried managers are required to work six-day weeks. The company's management turnover, however, is low, and bonuses and salaries are generous for upper management. "There's no frivolity at IBP," says Kevin McCullough, former Iowa Beef marketing research

Swift has dropped to fourth place. Operating profits have plummeted 70% over the past five years, and Swift's contribution to total corporate earnings is just 11%, even though it generates 66% of sales. All this has come about even though Swift has shut down 27 inefficient packinghouses since 1968. To offset the $200 million to $300 million in write-downs associated with the planned plant closings and sales, and to generate capital for new investments, Esmark also wants to sell its Vickers Energy Corp.

Esmark's plan to rid itself of Swift is the harshest action taken to date by the so-called old-line meatpackers, which include Greyhound Corp. subsidiary Armour & Co. and LTV Corp.'s Wilson Foods Corp. To remain competitive with such new-breed packers as Iowa Beef Processors Inc. and Cargill Inc.'s MBPXL Corp., old-line packers have shuttered aging plants in urban markets, shifting production closer to cattle feedlots. But the older packers still have labor contracts in which wages and benefits are typically 40% higher than those of their new competitors.

Swift did try to salvage two of the three plants it is closing. In last-minute overtures to the United Food & Commercial Workers Union, which represents meat cutters, Swift proposed an employee stock ownership plan and asked for concessions in current contracts. But Copeland concedes that the offer was vague, and the union rejected it. Lewie G. Anderson, assistant to the director of the union's packinghouse division, describes Swift's proposal as "ridiculous." He contends that, since 1968, Esmark has moved out of fresh meat so resolutely that "there was nothing the union or the workers could do about it." Anderson says the union's intent is to solve its industrywide problems by bringing compensation levels at all packinghouses up to the levels at the old-line companies. Even so, Swift's immediate dilemma is exemplified at its Moultrie (Ga.) plant, where wages of $14 per hour are almost twice the rate of its local competitors.

Selling abroad? Swift now wants to sell its remaining five pork plants, one beef plant, one chicken plant, and two lamb plants, which have combined sales of $1.9 billion and more competitive labor costs. With future pension costs covered by the cash he expects from the Vickers sale, Kelly reasons that the pared-down operation will be attractive to suitors—most likely a European company.

Still, whoever buys Swift's remaining fresh meat plants might find new problems lurking. Iowa Beef is now proposing to begin slaughtering pork, and many of its plants are nonunion. This raises the specter that all unionized pork plants such as Swift's could become noncompetitive. Such an occurrence, admits Kelly of Esmark, could certainly throw the rest of Swift's fresh meat plants into a threatening "different ball game."

manager and now president of Colorado Management Consulting Partners in Boulder. "They're like the University of Texas football team—they never stop."

Peterson, who took over after founder Holman's death in 1977, is also attempting to rid the company of the tarnished image it acquired after Holman and the company were convicted in 1974 of conspiracy to commit bribery in order to get the company's boxed beef into the New York market in 1970. Peterson especially wants to dispel this image on Wall Street. Meeting with security analysts in New York recently, Peterson's first order of business was to insist that the company had no ties to organized crime and that none of the company's current executives were involved with the earlier charges.

Although the company faces no further charges, its troubles are far from over. In addition to the antitrust suits now in preliminary stages in U. S. District Court in Dallas, Representative Neal D. Smith (D-Iowa) has introduced two bills aimed at preserving competition in the meat industry by limiting a single meatpacker's share to 25% of the market. Although the new bills have little likelihood of passage this year, they demonstrate the scrutiny under which Iowa Beef must operate.

Iowa Beef's moves could also trigger a competitive thrust from other "new breed" packers that followed tactics similar to Iowa Beef's in the beef market of the 1960s, such as Spencer Foods Inc.—which has already expressed an interest in pork—and Cargill Inc.'s MBPXL Corp. unit. But few doubt that Iowa Beef will be successful if it sweeps into the pork industry as it did with beef. "Iowa Beef is absolutely driven to be the lowest-cost producer," says former marketing manager McCullough. "It's going to apply that to the pork business." ■

Orion Capital: A shady ancestry shapes an insurer's future

By most measures, Orion Capital Corp. should not exist at all. Orion emerged from the funeral pyre of the once high-flying Equity Funding Corp. of America, which had pulled off one of the century's biggest business frauds. By creating and reselling phony policies through its principal life insurance subsidiary, Equity Funding had bilked insurance companies and investors out of millions of dollars over nearly a decade. When it collapsed in April, 1973, Equity Funding seemed among the least likely of candidates to survive Chapter X in any form. In fact, after auditors sifted through its records, the $143 million net worth the company

had reported turned out to be a negative \$42 million.

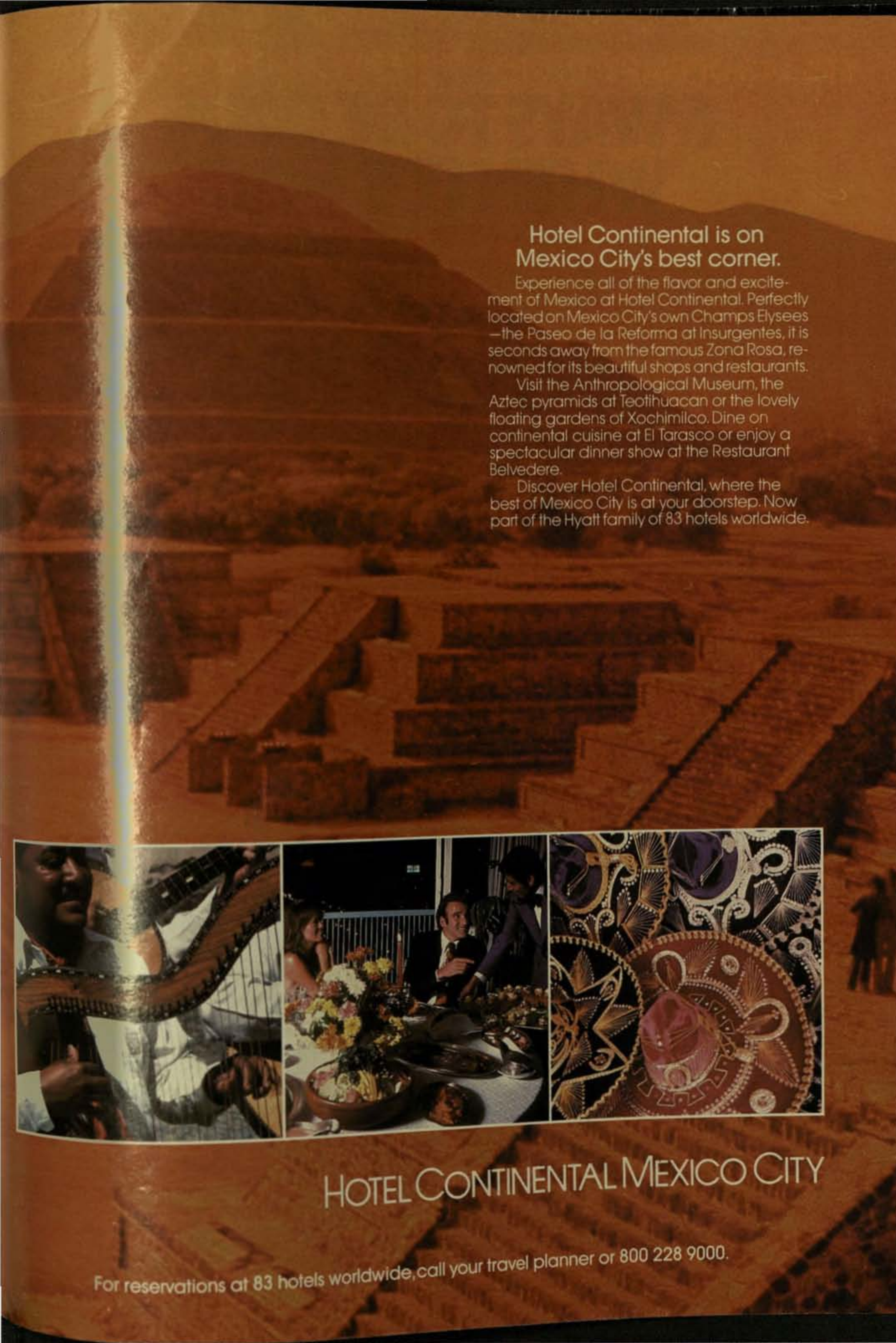
Nevertheless, a new business was reorganized around Equity Funding's two untainted life insurance companies, brought out of receivership in March, 1976, as Orion Capital. But, ironically, four years later, Orion's chairman and chief executive, Alan R. Gruber, is now being sorely criticized by financial analysts and other observers for taking too conservative a path. By failing to grow rapidly enough, Orion this year is likely to lose a significant piece of its birthright in tax-loss carryforwards. Although the precise sum still must be approved by the Internal Revenue Service, about \$33 million of a total of \$78 million in carryforwards expire this year, and Orion's executives concede they will probably be unable to use as much as \$16 million of them.

At the same time, management has rejected an offer to sell the company to a brokerage house that could use the balance of the carryforwards, even though the bid carried a hefty suggested premium over the stock price. Gruber insists Orion can grow on its own. Moreover, he declares: "The company should not be taken over on a bargain-counter basis that would, in effect, injure shareholders once again."

Ross Lewis

Orion's Gruber: "We have a very, very strong desire to be beyond reproach and to keep out of trouble."

Cautious approach. Gruber was appointed to his job by Equity Funding's reorganization trustee. A former director of strategic planning for Xerox Corp., he was completely uninvolved in the prior scandal. Yet from the beginning, Gruber says the specter of Equity Funding has haunted his thinking, causing him to set as a prime goal for Orion the avoidance of moves that might cause outsiders to be distrustful of Equity's child. "We have a very, very strong desire to be beyond reproach and to keep out of trouble," Gruber says. "We want to avoid anything that could get people to say, 'They're acting like the guys before.'" Adds Stephen A. Crane, vice-president and director of corporate development: "Our past has caused us to be more con-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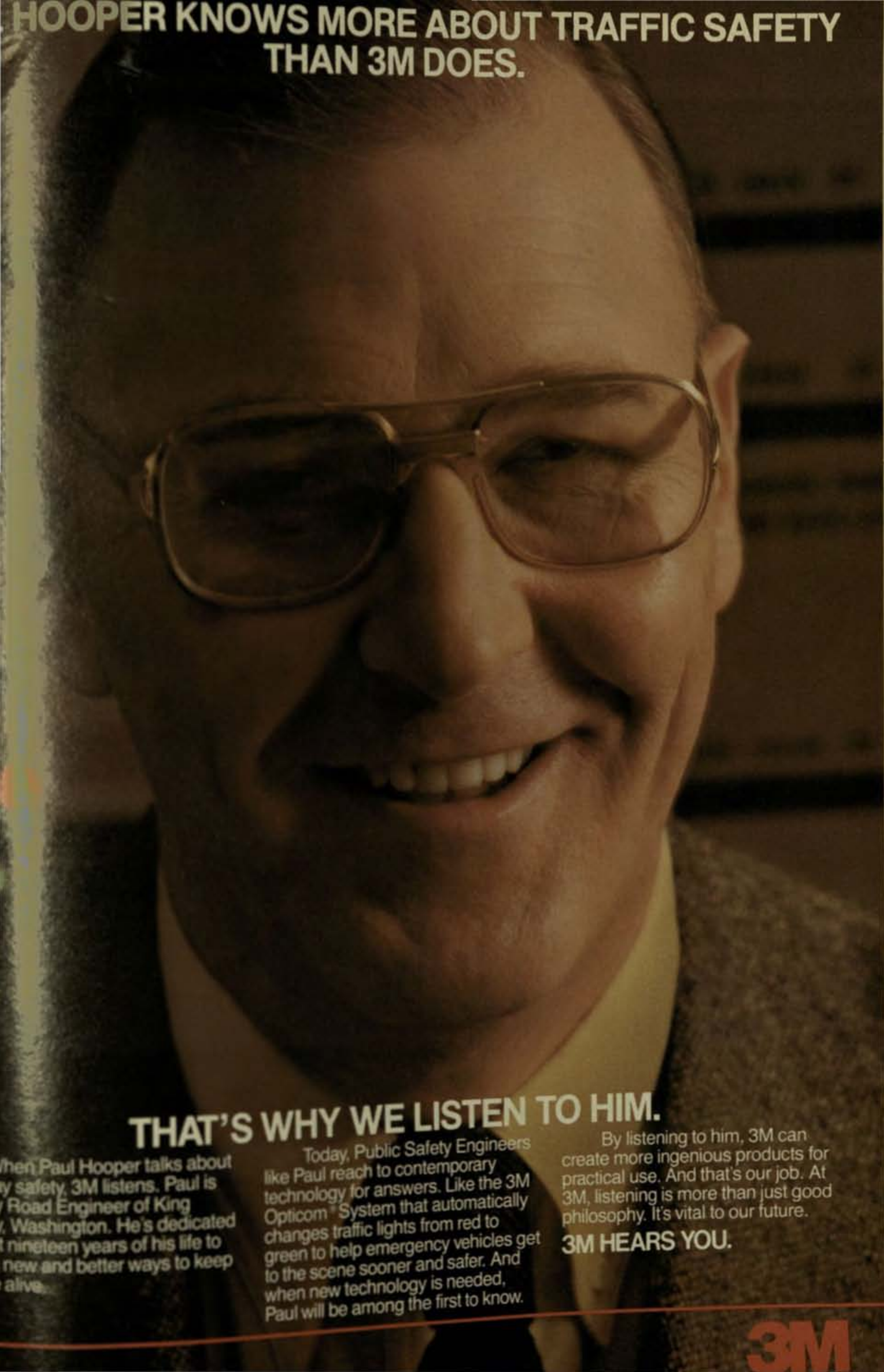
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But Gruber's critics claim that he has gone too far: He has not been enough of a dealer for his company's own good. Since its birth, Orion was under a mandate for massive change. Acquisitions were imperative, since the tax-loss carryforwards from Equity Funding could not be applied legally to earnings from the two life insurance companies.

Thus, in 1977, Gruber made the first of two major restructuring moves: He sold one of the two life insurers, Seattle-based Northern Life Insurance Co., for \$52.5 million in cash, which he used partly to pay down \$39 million in bank debt that Orion had acquired from Equity Funding. In March, 1978, Orion then purchased a property-casualty insurer, Security Insurance Group, of Hartford, for \$63.4 million in cash, notes, and warrants. Property-casualty insurance in 1979 contributed 61% of Orion's \$210 million in revenues and slightly more than half of operating income from insurance before interest and overhead.

Hasty moves. In some ways, these changes have brought impressive results. Orion's earnings of \$14.5 million last year were more than double those of its first year after the reorganization. This has helped push Orion's common stock, valued at \$4.50 a share on the first day it traded, to a recent price of about \$14. The stock must rise much more to fully compensate Equity Funding's shareholders who were given one share of Orion for each \$88 they claimed to have lost on their original securities. Undoubtedly, the holders who, on the first day of trading, dumped 153,000 shares, rue their decision.

Although earnings have advanced sharply, outsiders contend that Orion's growth has not gone far enough. Gruber has made at least five modest offers to acquire smaller insurance companies over the past year and a half, but he has been outbid in every case. Similarly, since early 1979, Gruber has been looking for a significant acquisition outside the insurance field. Yet his proposals to buy all or most of three other companies were unsuccessful as well. As part of his conservative stance, he is unwilling to effect a hostile tender.

As a result, Gruber has not caused nearly enough growth to absorb the tax credits. "He's had since 1976 to work on it, but much of that money is going down the drain in six months," snaps one executive who has followed Orion. "That's silly planning." The carryforwards also have helped attract three inf[illegible]al bids by Shearson Loeb Rhoades [illegible] the brokerage, to acquire Orion. [illegible] Gruber's rejection of those bids has [illegible]d some shareholders. Even before [illegible] Shearson bids, three of them had take[illegible] a full-page ad in *The Wall Stre[illegible]al* to protest Gruber's failure to [illegible] merger proposals. A fourth stoc[illegible]er last month announced he was [illegible] to file

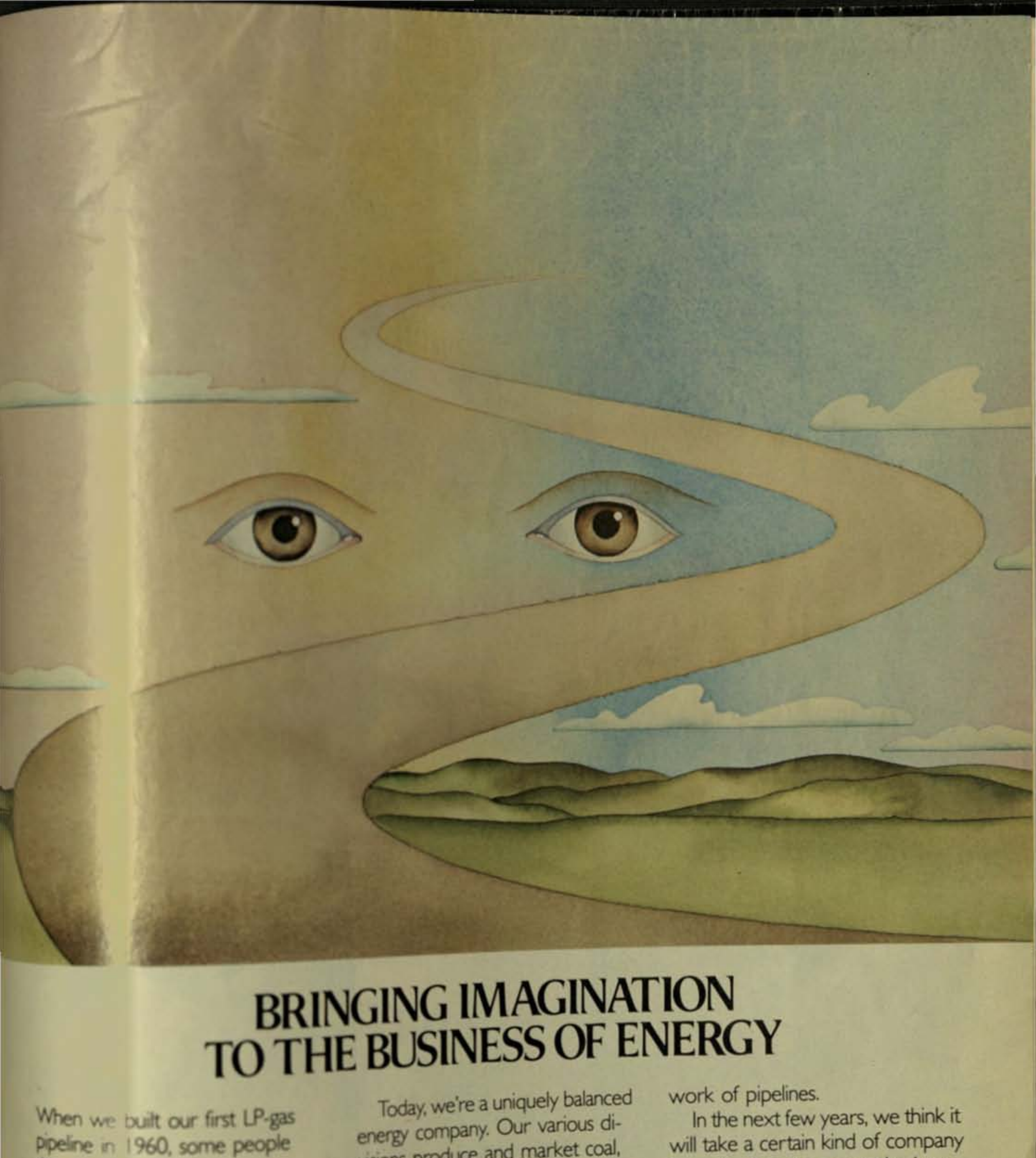
Orion may be unable to use \$16 million of \$33 million in tax-loss carryforwards

proxy materials calling for [illegible] election of a new board. Even if Gru[illegible] prevails, Orion's continued independen[illegible] is uncertain. Suggests one insuran[illegible] industry observer: "A hostile tender [illegible]ld come out of the blue at any tim[illegible] Orion is walking a tightrope."

Gruber argues that his pl[illegible]ad to be implemented carefully to a[illegible] making poor acquisition decisions [illegible] to use the tax credits. But becaus[illegible]as paid down debt and increased e[illegible] he believes that Orion is in a bett[illegible]ition to make a large acquisition in [illegible] closely related fields as consume[illegible]nce or savings and loans.

No gambling. Gruber hopes [illegible]pend as much as \$100 million—som[illegible]f it by yearend—to make such ac[illegible]isitions, with the ultimate goal of bu[illegible]lding as much as half of the company['s] revenues from Orion's noninsurance operations in five years. Inflation-fattened claims in property-casualty insurance and borrowing on life insurance policies have made both businesses less profitable. Gruber wants to take advantage of the investment portfolios that subsidiaries manage by placing an increasing amount of those funds in stocks of companies that Orion may try to acquire.

In question is whether Orion's conservatism will block its success. Gruber has already turned down a suggestion from one shareholder to buy into the gambling industry because of Orion's commitment to shun anything that even hints at possible shenanigans. And although Orion's debt, at \$40 million, now stands at just 35% of total equity, Gruber feels he must avoid increasing it substantially, again because of his concern for the company's reputation for soundness. "We keep trying to downplay our heritage," he says. ■



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How a new chief is turning Interbank inside out

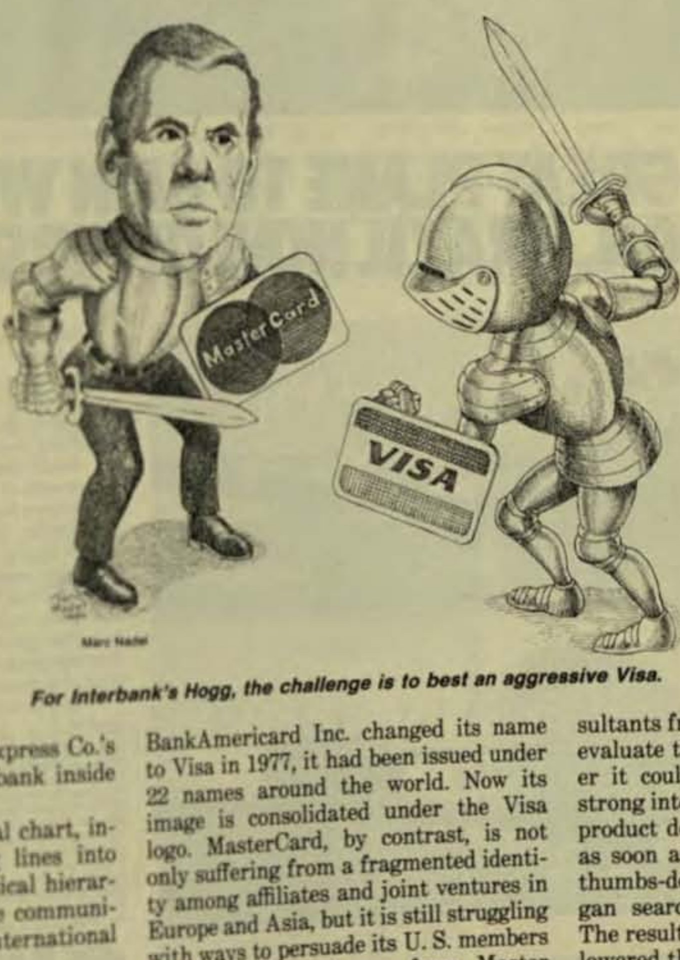
When a company's market share erodes so that it loses its No. 1 spot in its industry, it is usually time for a new chief with a new approach to take over. But the new head has to walk a veritable mine field in trying to regain the company's original momentum. If he changes things slowly, he can be left with a management team that is uncertain about its future and unwilling to act until it receives clear and unequivocal direction. If he shakes things up quickly, morale can be devastated.

Those were the options facing Russell E. Hogg when he assumed the presidency of Interbank Card Assn. last February. In 1979, Interbank, the umbrella organization for MasterCard, fell into second place behind Visa both in dollar volume and number of cardholders, and Interbank's board was clearly pushing for some changes. But Hogg (pronounced Hoag) has made his changes with such speed that people both within and outside Interbank are wondering what hit them. His method: get unwanted executives out as quickly as possible, get a new team on board almost simultaneously, and then institute so many sweeping changes that people are too busy reorienting themselves to get depressed. As he puts it, "The alternative of dropping one shoe today and another tomorrow did not make sense."

The moves. In the last four months, Hogg, a former Macmillan Inc. executive who also has eight years' experience with American Express Co.'s Card Div., has turned Interbank inside out. He has:

- Redrawn the organizational chart, inserting horizontal reporting lines into what had been a classic vertical hierarchy. The aim is to encourage communication, particularly about international affairs.
- Moved several of the support divisions to St. Louis, where they are being consolidated under Lawrence J. Szambelan, a newly hired senior vice-president for operations.
- Abolished all high-level positions involved with international affairs, making international responsibility part of each department's job.
- Eliminated all people involved with drumming up new U. S. members. Hogg believes the domestic credit card market is already saturated.
- Summarily fired eight high-level officers of the company, giving them just enough time to pack their things and contact the outplacement firm he retained for them.

Now, Hogg's new executive team is in place. But even with a new team and new directions, it will be no easy task to turn MasterCard back into the front-runner. The vast majority of card-issuing banks in the U. S. already issue both MasterCard and Visa, but Visa appears to have a clear lead in forging a cohesive international identity. Before National BankAmericard Inc. changed its name to Visa in 1977, it had been issued under 22 names around the world. Now its image is consolidated under the Visa logo. MasterCard, by contrast, is not only suffering from a fragmented identity among affiliates and joint ventures in Europe and Asia, but it is still struggling with ways to persuade its U. S. members that the name-change from Master Charge implies broadened usage for the card above and beyond credit.



For Interbank's Hogg, the challenge is to best an aggressive Visa.

Interbank is also trailing in the new-product area. When it tried to enter the traveler's check market a few years ago, it was immediately slapped with a suit from Citibank, charging that it was infringing on its own members' turf. Visa, which avoided similar suits or disaffection from members by issuing its checks through its member banks, has had a relatively smooth entry into that market. Although Citibank recently dropped its suit, clearing the way for Interbank again to pursue traveler's check revenues, the MasterCard agency has a lot of catching up to do.

The same holds true for Interbank's attempt to move MasterCard away from being exclusively a credit instrument. Hogg says he is giving top priority to developing a "debit" card that allows fund transfers and payments rather than credit. But the Visa card has been doing double duty in this area for some time. In fact, Dee W. Hock, Visa president, seems singularly unperturbed about the threat of competition from the "new" MasterCard. "Nobody has reached a stage to be able to compete with Visa on a worldwide payment system," Hock states. And even Hogg reluctantly admits that "Visa developed sophisticated products and knew how to sell them."

Consultants. Clearly, Hogg felt that the only way he could infuse such knowledge at Interbank was by making a clean sweep of the talent in place. Although the firings were sudden for the released executives, none of whom could be reached by BUSINESS WEEK, they were by no means impulsive moves on the new chief's part. Shortly after joining Interbank, Hogg called in consultants from Coopers & Lybrand Inc. to evaluate the existing staff to see whether it could fulfill his requirements for strong international marketing and new-product development skills. Apparently, as soon as the eight executives got the thumbs-down sign from C&L, Hogg began searching for their replacements. The result: Scarcely three weeks after he lowered the boom, a new executive team had been formed.

Brian W. Smith, senior vice-president for legal affairs, remains one of the few familiar faces. F. David Brangaccio, formerly a Coopers & Lybrand consultant who did work for Interbank, has already come on board as senior vice-president of planning and administration. And

within a few weeks, George J. Fesus, now a senior vice-president at American Express' Card Div., will assume the post of senior vi[illegible]-president of marketing.

Hogg ma[illegible]es no bones about wanting to institut[illegible] a higher degree of "professionalism" [illegible]o the running of Interbank. In [illegible]ct, he is borrowing a page from clas[illegible] business textbooks in his new setup[illegible] the four senior vice-presidents hav[illegible] [illegible]en formed into an executive counci[illegible] [illegible]t will meet regularly with him for pl[illegible]ng and continuity.

But app[illegible]tly he is also hedging his bets. Desp[illegible] the implied slap at himself and his n[illegible] [illegible]eam, Hogg readily admits that peopl[illegible] [illegible]o see association work as a lifetime [illegible] [illegible]er may not be the shakers and move[illegible] [illegible]at a floundering association needs[illegible] [illegible] he is currently scouring the emplo[illegible] [illegible]nt market for a rotating cadre of a[illegible] [illegible]st four young MBAs who would com[illegible] [illegible]s short-term semi-turnaround ar[illegible] "I want people who will stay no le[illegible] [illegible]n 18 months but no more than thre[illegible] [illegible]s, who want exposure to strategic [illegible]ning and international marketing[illegible] [illegible]ho want to work with banks," H[illegible] says. "These are the people whose [illegible]er objectives go far beyond the p[illegible] [illegible]ency of an association."

The ne[illegible] [illegible]anization has the clear support of Interbank's 27-member board, all of whom seem to believe such changes were long overdue. Hogg's predecessor, John J. Reynolds, did not step down by choice. Now 57, he candidly admits that he intended to stay until he was 60. Instead, he is now serving out a three-year contract as a consultant to Interbank. "This is the era when heads of companies are fired whenever something goes wrong," he says bitterly. Reynolds describes himself as a "people-oriented" manager, and says Hogg relies heavily on "management techniques."

In Hogg's reorganization, eight top executives were summarily dismissed

Not surprisingly, Reynolds believes the massive executive firings in June were as unnecessary as his own dismissal. "Some of the people who are now not there were excellent employees, and I think they'll be missed," he says.

But board members and outsiders who have been close to Interbank disagree. Robert F. Martin, head of Coopers & Lybrand's search division and the man who found Hogg for Interbank, recalls that at the time of instituting the search board members told him they "weren't certain of the quality level of the people at Interbank," and that it was clear they expected a new man to clean shop. "When Russ fired those people, rumors took off that he was ruthless, but he did it in the most humane way he could," Martin insists.

Upgrading. Evan H. Housworth, who until February was chairman of the board, confirms that "we obviously hired a new president to review Interbank and see if staff changes were needed, since we felt there would be areas of the staff that needed upgrading." And J. Donald Saul, the current chairman, says: "We wanted someone heading our organization who would solidify our market in the world. Whenever there's a change at the top there is a change in lower echelons. You have to start riding new horses."

As far as Hogg is concerned, talk of whether he should or should not have fired people is just so much wheel-spinning. He says he called together nearly all of Interbank's 200-or-so employees, explained the reorganization to them, and now is ready to move on with the business at hand. "The reorganization was done on a clinical, not an emotional, basis," he says. "My first and foremost priority is ensuring that we get back into the competitive market." ■

CARTER WANTS OUT OF THE GRAIN BAN

The Carter Administration is beginning to agonize over its politically risky January decision blocking U. S. grain shipments to the Soviet Union until the Russians pull out of Afghanistan. Despite month-long resistance by National Security Adviser Zbigniew Brzezinski, the Administration recently gave U. S. grain traders the go-ahead to use foreign subsidiaries to ship non-American grain to the Soviets. Now U. S. officials are dropping hints of a further relaxation of the embargo late this summer.

"We are approaching the point where the original [U. S.] policy and the circumstances that gave rise to that policy are clearly going to be open for review," says Lynn Daft, a White House agriculture expert. "There is a new crop here and a new crop in the Soviet Union. Foreign nations agreed to help us for a period of time, and we are approaching an end to that [period]."

Whether the embargo is heavily modified or dropped depends largely on the Soviets, who have yet to make a convincing gesture in reducing tensions in Afghanistan. But with farmers furious over the effect of the embargo in depressing domestic grain prices—and with U. S. allies increasingly reluctant to go along—Carter is groping for a face-saving way out.

After announcing his January embargo, the President asked U. S. grain exporters not to sell the Soviets third-country grain through foreign affiliates, and the companies complied. But the Administration's Apr. 30 decision to honor the fifth year of the U. S.-Soviet grain agreement by allowing the sale of 8 million metric tons of U. S. corn and wheat sparked a new debate.

In heated discussions, the State and Agriculture Depts. successfully argued that it was discriminatory to permit American companies to ship U. S. but not Canadian and Australian grain and that U. S. exporters were losing business. "The biggest obstacle," says one insider, "was Brzezinski's resolve that this would be interpreted as a weakening of the embargo policy." Indeed, even after Carter agreed to permit third-country shipping, Agriculture Under Secretary Dale E. Hathaway insisted that "there has been no relaxation or change in our policy."

But, in fact, political pressures are growing on Carter to do just that. Unhappiness with both the economic downturn and the embargo has sent Carter's stock plummeting in the farm belt, which is looming as a battleground in the Presidential campaign. The American Farm Bureau Federation and the National Farmers Union are lobbying for an end to the embargo. A bipartisan group of 32 senators, led by Robert J. Dole (R-Kan.) and Thomas F. Eagleton (D-Mo.), is pushing for legislation to repeal the embargo outright. And soybean producers, who would be excluded from the newest approved grain sale, are appealing to Brzezinski's National Security Council to be allowed to sell the Soviets 700,000 metric tons of soybeans.

For now, Administration officials emphasize that Carter has made no decision to alter his embargo policy beyond allowing third-country grain shipments. According to one official, the Administration intends to wait until August or September before taking any more steps. By then the U. S. will have a much firmer idea of how big the Soviet grain crop will be and whether the Russians will need to make major additional purchases. Moreover, the boycotted Moscow Olympic Games—a continuing irritant to U. S.-Soviet relations—will be over by Aug. 3.

Already, just the glimmer of hope that the embargo policy might be loosened has helped firm up the U. S. grain market. Immediately after the U. S. allowed the resumption of third-country shipments, wheat prices soared nearly 6¢ per bu. on the Chicago Board of Trade. Occidental Petroleum Corp., whose agreement to ship 700,000 tons of superphosphoric acid to the Soviet Union was frozen by the trade ban, is considering asking for its own third-party arrangement to ship phosphates from Tunisia, Morocco, and Mexico to Russia.

The political risk for Carter is that, having raised expectations with hints of a more relaxed export policy, he may have to dash all the rising hopes in the fall if the Soviets do not relent on Afghanistan. Should that happen, the Administration's trial balloon—and any prospects Carter may have had for salvaging votes in the farm belt—may be quickly deflated.

Capital wrapup

PEOPLE: Robert A. Charpie, a New England energy executive, is in line to be named chairman of the new $20 billion Synthetic Fuels Corp. Charpie is president of Cabot Corp., a Boston-based oil and gas company. Earlier Administration efforts to tap a well-known chief executive to head the synfuels corporation were unsuccessful: Both Irving S. Shapiro, chairman of Du Pont Co., and Charles F. Luce, chairman of Consolidated Edison Co., reportedly turned down the post.

POLITICS: Ronald Reagan's supporters will mount a drive to embarrass the Administration over a plank in the Democratic platform calling for an eventual phaseout of nuclear power. Carter forces argue that the provision—which was rammed through over White House objections—is vague enough to imply the continued use of nuclear power for the foreseeable future. But Reagan partisans, led by Representatives Carroll A. Campbell (R-S.C.) and David A. Stockman (R-Mich.), are preparing a report alleging that a shutdown of nuclear reactors would lead to brownouts and blackouts. After the July 4 congressional recess, the pair will introduce legislation to prohibit the phaseout of any energy source if the result would create low electric capacity reserve margins in any region. Nuclear industry representatives, who want to keep a low political profile, are cool to the idea.

PROMISES: Ronald Reagan has assembled a group of former top Nixon and Ford Administration officials to help him put price tags on his campaign proposals. Alan Greenspan, previously chairman of the Council of Economic Advisers, has agreed to head a budget advisory committee for Reagan. Others in the group are Caspar W. Weinberger, former Health, Education & Welfare Secretary, and Paul H. O'Neill and Donald Ogilvie, former officials of the Office of Management & Budget.

Gearing the tax system to growth

In this summer before the 1980 elections, taxes have suddenly emerged as a white-hot issue. In part this is because the recession is biting far deeper than the Administration or Congress expected, and unemployment is rising faster than any elected official thinks the system can tolerate. In part it is also a product of the old philosophy of buying elections by returning their own money to taxpayers. But this emotional response hides two real fiscal problems the U. S. economy faces next year:

- On Jan. 1, new taxes will go into effect taking an additional $47 billion out of the economy unless Congress acts. This fiscal drag will worsen the recession and impede recovery.
- Despite the recession, the fight against inflation has not yet been won. Because of increasing wages, the underlying rate of inflation will hold close to 10% regardless of what the consumer price index reads.

None of the tax programs being proposed addresses these problems. Rather, they continue the obsolete approach of cutting taxes to stimulate demand. The Republicans would cut income taxes 10% across the board. The Democrats are talking about cuts concentrated in the lower brackets. Either proposal would set off a new and more virulent round of inflation, weakening the competitive position of the U. S. in the world economy and putting a damper on saving and investment.

What Congress has to do is adjust the tax structure for this fiscal drag and not pass it off as a tax cut. First priority has to be to offset the increase of $16 billion in Social Security taxes, $15 billion from windfall profits taxes on oil companies, and $16 billion from "bracket creep" in the personal income tax. All these increases would be piled on top of a tax structure that already is so high it would generate a $30 billion surplus if the economy were running at full employment levels.

Tax adjustment at this time should consist of three remedies: a change in the tax treatment of depreciation of fixed assets, reduction of capital gains taxes, and some sort of offset for the burden that the rise in Social Security taxes will impose on wage incomes. The object should be to encourage investment and soften the impact of payroll tax increases before they trigger huge new wage demands.

Stimulating capital spending is a precondition of economic growth in the U. S. As a start in this direction, business should be allowed to use some version of the so-called 10-5-3 depreciation schedule in estimating taxable income. That is, it should be able to write off the cost of real estate in 10 years, machinery in 5, and light equipment in 3. The immediate costs would be low—$3 billion to $5 billion in fiscal 1981. But within five years, 10-5-3 would make an additional $50 billion a year available for investment.

The capital gains tax should be repealed or reduced to a very low rate for the simple reason that in a time of inflation it amounts to confiscation of capital and a penalty on investment. As an additional incentive for investors, interest income and dividends should be entitled to the 50% limit on bracket rates that now applies to salaries.

The $16 billion Social Security tax increase now scheduled to take effect next year is a two-edged sword. Not only will it depress demand, it is highly inflationary because it reduces take-home pay and inflates wage demands. The long-run answer has to be a careful revision of benefits and finances for the whole system. There is no hope of doing this by next January. And so Congress should provide temporary relief—for not more than two years—by allowing an offsetting credit against personal income taxes.

There is no need and no excuse for big, personal income-tax cuts designed to put loose money into the voters' pockets. But there is an urgent need for tax revision that will lighten the load on investment at the same time that it spares the economy the shock of a massive increase in 1981.

Steering the dollar through a policy turn

If the U. S. is going to check the economy's downward swing, it must relax monetary policy as well as reduce the fiscal drag of the budget. To do this, it will need some wise management by the Federal Reserve and some help from its allies and trading partners.

The Fed took a long step toward effective money management last October, when it decided to use the growth of money aggregates rather than interest rates as its principal guide. But now, as the economy slides down, the Fed is not achieving even its minimum target of 4% annual growth in money supply.

To give the country adequate money growth, the Fed will have to achieve the target, and that will mean pumping reserves into the system. In doing so, it may well drive interest rates down. Instead of letting the drop trigger a run on the dollar, the industrial countries of the world should take steps to coordinate their monetary policies and reduce their interest rates.

At the recent summit meeting in Venice, West German Chancellor Helmut Schmidt and other world leaders voiced the fear that the U. S. would drag down the rest of the world by failing to recover soon enough. If this is anything more than generalized grousing, Schmidt should be willing to back it up with German monetary policy.

The European central banks must take action that permits the Federal Reserve to concentrate on promoting growth of the money stock rather than shielding the dollar. Otherwise, they may make their fears come true.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RCA improves color TV with an electronic "fine tooth comb" that separates color from detail. And enhances both.
The Dynamic Detail Processor – a tiny solid state comb filter device with a computer-like "memory" – is producing sharper and clearer color TV pictures than ever before in RCA Limited Edition ColorTrak TV sets. By electronically separating the signals responsible for color and picture detail, the comb filter allows *both* signals to be fully processed by the set. As a result, minute details take on remarkable new definition and clarity, while color streaking and crawling edges (like those on checkered sport jackets) are virtually eliminated. RCA color TV sets are the first to have this solid state marvel of technology designed into them.
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What makes Tandem run

Information processing

DATA PROCESSING

What makes Tandem run

Tandem Computers Inc. has to be one of the biggest success stories around—even in the fast-rising minicomputer industry where dramatic growth is sometimes taken for granted. In June the Cupertino (Calif.) company shipped its 1,000th computer, just four years after delivering its first system. The company is growing at 100% annually, with revenues now running at a $100 million annual clip.

While Tandem's unique, single product still has no direct competitor, the young company's wild success is due equally to its unorthodox management style, which provides everything from Friday afternoon beer parties for its 1,100 workers to a sabbatical every four years and stock options for every employee. This "people-oriented" management style emphasizes complete informality, peer pressure, and open communications. There are few formal meetings or reviews, and the management team and organizational structure is already in place for a $500 million-plus operation. Industry experts, in fact, expect Tandem to reach easily its revenue goal of $500 million annually by 1983.

Reliability. Tandem's present prosperity is built on a "fail-safe" computer that will not lose data if any part of the system goes down. While other fail-safe systems usually require a redundant, back-up computer that lies idle unless the on-line system fails, Tandem's computer design allows dual central processors to share the data-processing workload and to take over the entire job should one break down. The system's reliability makes it especially attractive to banks, airlines, and other businesses where lost or interrupted data means lost revenues.

Without varying its management style, the computer maker has broken through the difficult growth transitions that any young company must pass. "Tandem has done very well at getting over the management plateaus at $3 million and again at about $50 million that affect growth," notes David E. Gold, a Saratoga (Calif.) consultant. And in the year ended Sept. 30, 1979, Tandem came within $1 million of the sales projection made in its 1974 business plan, boasts Thomas J. Perkins, Tandem's chairman and a partner in Kleiner, Perkins, Caulfield & Byers, the venture capital firm that provided the company with its initial seed money.

"When you get above $5 million, it's hard for a person to manage everything like a mother hen," say Gene M. Amdahl, founder and now chairman emeritus of Amdahl Corp. "As the company grows," Amdahl says, "it's easy to lose the entrepreneur's vision of what the company should be. But I don't believe it absolutely has to happen."

Neither does James G. Treybig, Tandem's co-founder and president, who figures that his company will need its people-oriented management philosophy more than the latest technology to continue to grow at its current pace. "The human side of the company is most important to make the $1 billion mark," declares the 39-year-old executive. Treybig says that he has "100% disposable time" with which to work on people projects such as his new chart of 100 management concepts that he uses to guide the company. The chart emphasizes such notions as pushing responsibility down the employee ranks to develop managers faster, hiring the best person rather than the cheapest, and promoting from within.

The genesis of Tandem's management philosophy comes from Hewlett-Packard Co., which is not too surprising, since Treybig, along with the other three founders—Michael D. Green, John C. Loustaunou, and James A. Katzman, all vice-presidents—worked at the Palo Alto computer and instrument maker before forming the company. "We learned at HP," says Katzman, "but we've extended that philosophy here."

At Tandem, for example, employees have neither the time clocks nor the name badges usually found at other high-technology companies in California's Silicon Valley. And its workers have flexible hours, a swimming pool that is open between 6 a. m. and 8 p. m., a volleyball court complete with locker room and showers, and an open-door policy that invites employees to drop in for a talk with their managers anytime.

J. Bruce Baumann

A **"people-oriented" management:** President Treybig (center) at Tandem's pool.

"It's a lot of physical things," says Katzman, "but more important is our attitude that people are responsible adults and our willingness to spend money to keep people happy." One example of that corporate largesse is the six-week sabbatical—with full pay—that all employees are required to take every four years. This month, too, Tandem employees will vote on future benefits, choosing from among increased medical coverage, a retirement plan, profit sharing, or vacation privileges at resort condominiums the company would acquire.

Low turnover. So far, Tandem's people philosophy has paid off in more than soaring revenues. "The company is able to attract really excellent people in [a geographical] area where it is supposed to be hard to get them," says Edwin B. Costello, an industry analyst with Sutro

& Co., a San Francisco brokerage house. And once employees join the company, they apparently stay. Katzman claims turnover runs 8% annually, far lower than the industry average of 23%.

Tandem's reputation for hiring top employees who stay is no accident, according to the company. Job candidates are often called back three or more times for interviews lasting several hours. And salary offers are never made until a recruit accepts a job. "They've got to

Photos by J. Bruce Baumann

Informal: Co-founder Katzman at a weekly party; lively action on Tandem's volleyball court.

decide they're not just coming for the money," declares Treybig.

The company prefers to hire experienced people because they require less training, but even these people have to be indoctrinated in the corporate culture. And that is no easy task at Tandem, which is growing so fast that the average employee has been with the company for only six weeks. Treybig personally participates in most new employee orientations to spread the management gospel. And he uses peer pressure to inculcate recruits in the Tandem way. For example, a group of assemblers from the factory floor recently walked into his office to complain about their manager. "[The manager] soon left because he didn't look on people as people," Treybig says. "Now everyone knows that that mistake was fixed, and other managers will see that if they don't do what's right, they will be fired."

Indeed, decisions are made informally, and executives get together in spontaneous meetings as problems arise. Admits Chief Financial Officer Loustaunou: "We have no scheduled reviews of things like progress reports." So far, the company has managed quite well without formal meetings. Outsiders often note that communications among the top executives flow as freely as the beer that is served every Friday afternoon. "If you ask the same question of several managers, you always get the same answer," says Alvin C. Rice, a Tandem director.

Tighter control. Not everyone, however, is impressed with Tandem's management style. "Tandem's founders thought that HP had too many meetings, too many memos, and too much management," recalls John V. Levy, a former Tandem engineer now working for Apple Computer Inc. "My impression," he says, "is that they did a total flip-flop."

Treybig recognizes that, as Tandem grows into a large company, ad hoc decision-making will not suffice. So he is instituting more controls. In accounts receivable, for example, Loustaunou says that the company has grown too large for all of the top managers to be involved with each problem account. "A year ago, we had maybe 10 problem accounts," he says. "Now it is 30 to 40, and it is more appropriate to have our people tell us in writing the status of their accounts." Similarly, while the company still has no wage or salary structure, Loustaunou notes that it is only a question of time before formal review procedures are established.

But that does not mean that Tandem lacks controls on company operations. The company has rigid procedures for implementing production controls, cost standards, quality control, and management reporting systems. To handle these jobs, Tandem has eight separate in-house computer systems. "They have an informal management style imposed upon a very organized and disciplined set of business standards," says Rice. "You can't have their kind of growth without having those in place."

Treybig and his colleagues spend long hours preparing the company for the soaring growth they expect in the next few years. For instance, the executive team includes 14 vice-presidents, more than the company currently requires but necessary if it makes in three years its goal of $500 million in annual revenues. To handle that size company, Tandem has realigned its top management. Five management teams were given responsibility for marketing and production on a geographical basis.

The question remains, however, whether Tandem's Non-Stop computer can continue to be a nonstop success. While the Non-Stop still has no direct competition, Digital Equipment Corp. and several other companies are reportedly developing competitive systems. But industry observers predict that Tandem's rivals will have a difficult time duplicating the company's software developments in less than three years. "You can't have a baby in a month by making nine women pregnant," comments analyst Costello.

Confident. Treybig is even more confident of Tandem's ability to weather any competitive storm. The only inhibiting factor on Tandem's growth now, Treybig says, is the reluctance of some customers to buy computers from a vendor that has only $100 million in sales.

To raise his credibility with both customers and Wall Street, Treybig is running the company on a debt-free basis. But to do this and still grow at 100% annually means that Tandem has had to sell additional stock on a yearly basis. As a result, the number of shares outstanding has increased more than tenfold in the past five years to 5.2 million shares.

But James R. Berdell of Montgomery Securities in San Francisco points out that Tandem's price-earnings ratio of 36 is the highest of all of the technology stocks that he follows and almost double the computer industry average. For Treybig, such success is merely part of his long-term plan. "I never started Tandem thinking only of a $100 million company," the brash executive exclaims. "To build a $10 billion company where people loved to work would be a start." ■

TANDEM

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