Monsanto

ANNUAL
REPORT
1990



STRATEGIES
IN
ACTION

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Monsanto 1990 Overview

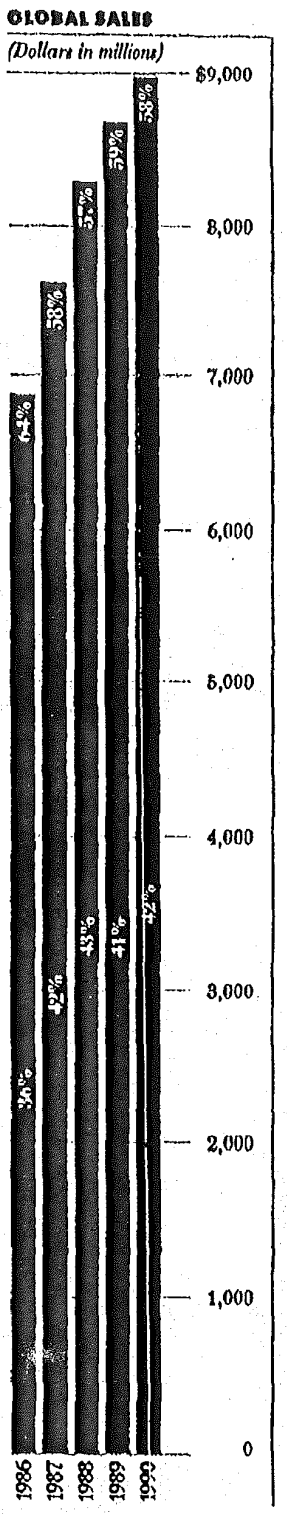
Monsanto Company had hoped to make 1990 its fifth successive year of earnings increases, but higher oil prices, poor weather and a slow U.S. economy kept us from reaching that goal. While results from Monsanto Agricultural Company and Monsanto Chemical Company were disappointing, Searle, The NutraSweet Company and Fisher Controls International performed at record levels in 1990.

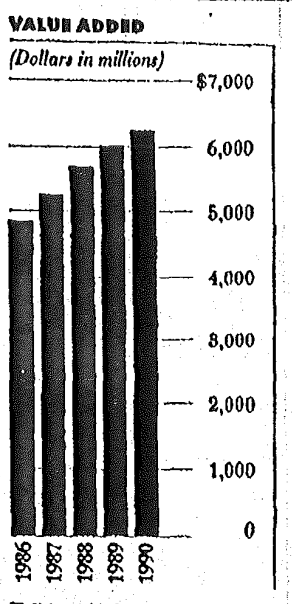
Net income for 1990 was $546 million, compared with record earnings of $679 million in 1989. Earnings per share for 1990 were $4.23, versus $5.01 per share earned the previous year. Consolidated net sales grew to $9 billion in 1990 from $8.7 billion recorded in 1989. Return on shareowners' equity dropped to 13.6 percent from 17.6 percent in 1989.

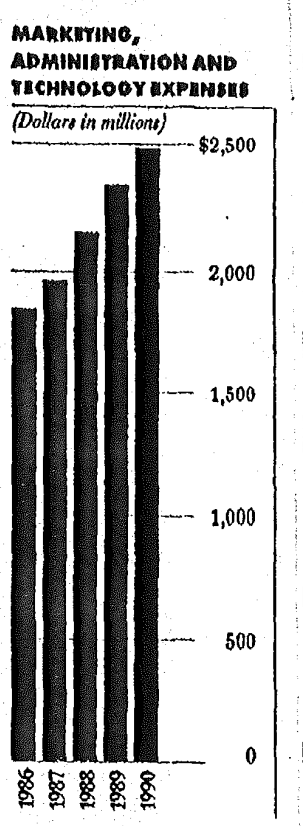
Monsanto's Commitments

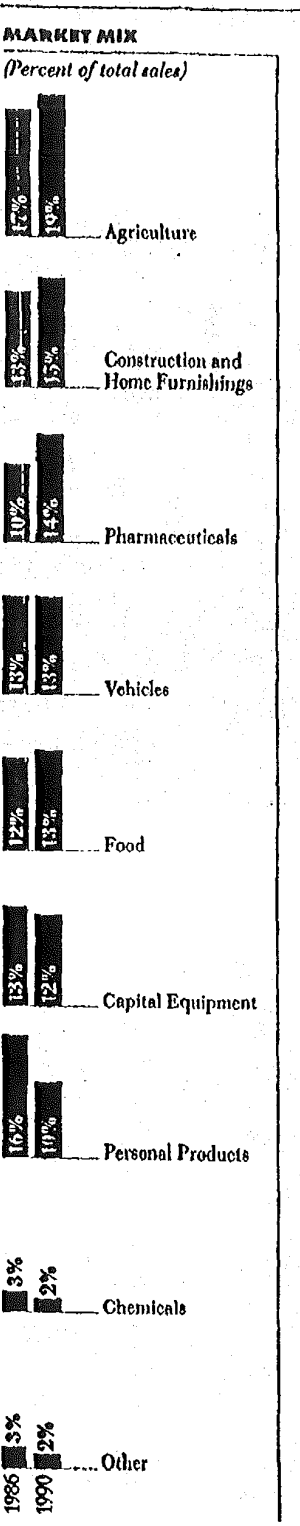
Monsanto Company makes and markets high-value agricultural products; chemical products, including man-made fibers and plastics; pharmaceuticals; food products, including low-calorie sweeteners and an all natural fat substitute; industrial process control equipment; and other performance materials. In doing so, we are committed to serving the interests of all those worldwide who hold a stake in our company by:

- Aiming for a consistent and superior return on equity for our shareowners;
- Meeting the needs of our customers with the highest standards of value, quality and service;
- Providing our employees with safe and rewarding work in an environment where each has an equal opportunity to succeed; and
- Striving for a lasting and rewarding partnership with our neighbors.









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Operational Highlights

(Dollars in millions, except per share)	1990	1989	1988
Net Sales	$ 8,995	$ 8,681	$ 8,293
Net Income	$ 546	$ 679	$ 591
Per Share:[1]			
Net Income	$ 4.28	$ 5.01	$ 4.14
Dividends	1.88	1.65	1.475
Shareowners' Equity	32.51	29.79	27.60
Depreciation and Amortization	$ 739	$ 690	$ 703
Cash Provided by Operations	$ 1,104	$ 1,037	$ 1,304
Research and Development Expenses	$ 612	$ 598	$ 575
Return on Shareowners' Equity	13.6%	17.6%	15.4%
Percent of Total Debt to Total Capitalization	35%	33%	34%
Shareowners (year-end)	62,230	61,942	66,066
Shares Outstanding (year-end, in millions)[1]	126	132	138
Employees (year-end)	41,081	42,179	45,635

[1] *Adjusted for the 1990 two-for-one common stock split.*



ABOUT THE COVER

Piece by piece, Monsanto employees worldwide turn strategies into action to achieve the company's goals.

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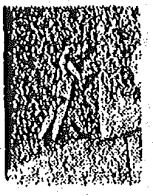
Strategies In Action

Monsanto Company's strategy was tested in 1990, yet remains the right course for the company to reach its long-term objectives.

We expected 1990 to be our fifth year in a row of earnings increases at record levels for the company. It didn't happen: Earnings dropped by 20 percent. We wound up with 1990 as our second-best year of earnings per share; however, the steady upward trend toward our financial goal of a 20 percent return on shareowners' equity was deflected. But only deflected, not stopped. The long-term strategies we put in place were tested in 1990, and they remain sound and appropriate.

The steady upward trend toward our goal of a 20 percent return on equity was deflected — but only deflected, not stopped.



Here's why:

Searle, The NutraSweet Company and Fisher Controls International met their targets, and each had a record financial year. However, the Agricultural and Chemicals units fell short. After analyzing the full-year results, we've concluded that the earnings drop in those two important units was



Richard J. Mahoney, chairman and chief executive officer (left), and Earle H. Harbison, Jr., president and chief operating officer.

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caused essentially by three elements:

- **The sudden increase in the price of petroleum-based raw materials following the Iraqi invasion of Kuwait.**

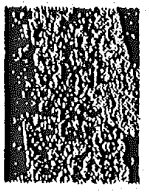
We weren't able to pass these increases through in our selling prices in 1990.

We've positioned ourselves as buyers rather than producers of petrochemical raw materials. Despite the run-up in oil prices, that strategy remains correct in view of the clear prospect for a long-term excess supply of petrochemicals worldwide.

- **The severe drought in Europe and California.**

Roundup herbicide is our leading profit performer, and the drought caused it to grow at well under the expected rate. However, *Roundup* maintained or increased market share in all major market segments. In 17 years of sales of *Roundup*, weather has been adverse in only two. We'll stick with the long-term weather odds and look for a healthy rebound in 1991.

In 17 years of sales of *Roundup* herbicide, weather has been adverse in only two. We'll stick with the long-term weather odds.



- **To a lesser extent, the slowdown in the U.S. economy.**

We've said that one major element of our corporate strategy has been to reduce the effect of industrial business cycles on our earnings. We've clearly done that with our value-added mix of businesses, although our Chemicals unit is still highly dependent on automotive and housing markets. We could have handled that single negative element — a weaker economy — in 1990 without a drop in corporate earnings.

The stock market leaned heavily on these events. Our stock closed the year down 16 percent versus the year-end 1989 close, compared with a 4 percent decline in the Standard & Poor's 400 year-to-year. However, for the five-year period from 1986 to year-end 1990, Monsanto provided an annualized return to shareowners (stock appreciation plus reinvested dividends) of 19 percent, versus 8.4 percent for the Standard & Poor's chemical index and 13.7 percent for the Standard & Poor's 400.

We want to ensure the financial market's confidence in Monsanto that brought our previous recognition, and we intend to do so.

Here are the major elements we're counting on:

- We have a rapidly growing pharmaceutical business in Searle. Searle made good earnings gains in 1990, led by *Calan* brand calcium channel blocker, now one of the top U.S. pharmaceuticals, with U.S. sales of $432 million in 1990, and by *Cytotec* ulcer preventive drug, with worldwide sales of $91 million in 1990. We expect to take another big step forward in 1991. Searle has been launching one new product a year, and its robust pipeline can support this pace. Of particular near-term importance are *Maxaquin*, a novel quinolone-class antibiotic; *Arthrotec*, a non-steroidal anti-inflammatory drug (NSAID) for arthritis with built-in protection against gastric ulcers; and zolpidem, a treatment for insomnia.

Searle has been launching one new product a year, and its robust pipeline can support this pace.



- We've discussed the expected volume rebound of *Roundup* in the Agricultural Company. During 1990, overhead costs were reduced as well. A new herbicide awaits clearance by the U.S. Environmental Protection Agency, and our first biotechnology-based product, bovine somatotropin (BST), for increasing dairy productivity, is well into the review process at the U.S. Food and Drug Administration (FDA).

The safety of BST in food has been confirmed by leading health organizations, including the FDA, the U.S. National Institutes of Health, the American Medical Association and more than 20 regulatory bodies worldwide. BST has been a long time coming. We think our belief in the value of this innovation and our shareowners' patience will be rewarded.

- *NutraSweet* brand sweetener for soft drinks, food ingredients and branded table-top equivalents will continue its worldwide market growth.

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The long-term outlook for the Chemicals unit remains solid, but projections for 1991 are difficult to make.



As we approach the December 1992 date for U.S. patent expiration for *NutraSweet*, our position is strong in cost and consumer loyalty. We've invested substantial sums in research, process work and consumer marketing to get to this position — all money well spent.

Simplesse all natural fat substitute was launched successfully in 1990 in The NutraSweet Company's own brand, *Simple Pleasures* frozen dairy dessert. Further worldwide launches of *Simplesse* as an ingredient in our food customers' products are expected in 1991.

■ Fisher Controls began to show its earnings potential in 1990, and further gains are expected in 1991 and beyond. Our worldwide customers' drive for quality and environmental improvement in their own businesses means major opportunities for Fisher's *PROVOX* instrumentation and high-performance valves that will offset the expected decline in capital spending in the United States.

■ The long-term outlook for the Chemicals unit remains solid, but projections for 1991 are difficult to make. A U.S. recession in several key industries is under way, but business outside the United States, accounting for 41 percent of Chemical Company sales, is still growing. The depth and length of the U.S. recession and the price of oil-derived raw materials in the short term will be the real questions for the Chemicals unit in 1991. Our best estimate now is for earnings in Chemicals to rebound in 1991.

■ The company's balance sheet and cash flow continue to be strong. In 1990, we used excess cash to purchase 6.7 million shares and increased the dividend for the 18th year in a row.

■ In the current uncertain economy, we've initiated contingency plans to hold costs in check. We have not, however, taken actions that would deter us from our long-term goals.

■ Environmental issues are of great importance to this company. Through the Monsanto Pledge, we've committed ourselves to serious, reportable improvement aimed at an appropriate long-term target of zero environmental effect. Our job will be to take this leadership role and ensure that it doesn't result in an uncompetitive cost, but becomes a commercial advantage. We intend to do so.

■ One of the most gratifying results of 1990 has been further progress in empowering our people at all levels to get their job done with maximum personal involvement and minimal bureaucracy. Results so far have been stunning in reducing costs and improving quality and safety. We're moving now to innovative reward systems designed to keep the momentum going. Empowerment promises to be a real competitive edge, indeed, a necessity in the worldwide marketplace.

In this chairman's letter, I think it's worthwhile to restate our long-term objectives and to describe our progress — "Strategies in Action," as our cover describes it — to make sure that what turned out to be less than we had hoped for in 1990 can be understood as a variant. We aren't returning to the historic up-and-down annual performance of some years ago, when we were at the mercy of wide swings in commodity chemical products. It will be our job in 1991 and beyond to turn those words into results and get the trend lines back on target.

Our job in 1991 will be to get the trend lines back on target.



Richard J. Mahoney
Chairman and Chief Executive Officer
March 7, 1991

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Executive Summary

Monsanto Company's family of complementary businesses is the touchstone of our enterprise.

By Earle H. Harbison, Jr.
President and Chief Operating Officer

When we restructured Monsanto Company in 1985, our intent was to create and develop a family of complementary businesses that would benefit from our existing knowledge bases and would respond to different economic forces to make the company substantially less cyclical.

We believe our progress has been significant. In 1990, for example, when a variety of circumstances adversely affected our traditional agricultural products and chemicals businesses, our pharmaceuticals, food and process controls units came through with resounding sales and profits.

All of our units are committed to introducing significant new products and to meeting challenging financial targets.

In 1985, our embryonic business mix was but a promising strategy. Today, it's the touchstone of the enterprise.

At Monsanto Agricultural Company, the new product pipeline includes many candidates for regulatory approval. Some emanate from our established strength in innovative chemistry; others will be in the first wave of genetically improved agricultural products.

Monsanto Chemical Company continues to provide the largest percentage of our sales, while opening doors into new markets through strategic alliances and new-product development to optimize growth opportunities.

Searle's record performance in 1990 was just a hint of things to come. New product candidates abound. The unit's competitive standing has been established in the global pharmaceuticals market. Searle is on track to become a leader in its industry.

The NutraSweet Company started as an enterprise based on the most successful new food ingredient of the past 20 years. Today, this powerful organization is strengthening its reputation by providing its customers marketing and product-development support, while continually lowering its own manufacturing costs. The result of this customer focus is an array of exciting new foods for the healthy lifestyles of today and tomorrow.

Fisher Controls International has become known to its customers as the quality leader in process control valves and instrumentation. That reputation is paying off: Fisher sales in 1990 set a record for the fourth straight year.

Considered individually — as an agricultural products business, a chemicals business, a pharmaceuticals business, a food business and a process controls business — these operating units have their own strategic imperatives and plans.

Considered as pieces of a whole, they represent a successful, complementary mix of businesses, as we intended when we restructured in 1985. All are committed to continuing new-product introductions of significant value and to meeting extremely challenging financial targets. The pages that follow offer an exciting update on our "Strategies in Action."











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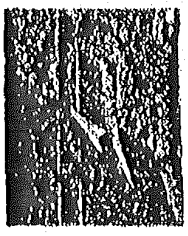
Monsanto Agricultural Company

MAC prepares its herbicide business for continued profitability, while organizing for a new wave of agricultural products.



Robert B. Shapiro, executive vice president, Monsanto Company, and president, Monsanto Agricultural Company.

Monsanto Agricultural Company (MAC) produces and markets agricultural products that are used in more than 100 countries. It is one of the leading herbicide producers in the world.

MAC's leading product in 1990 was Roundup *herbicide, the world's top-selling crop-protection chemical, also known for its favorable environmental characteristics. Continued growth of* Roundup *is central to the unit's strategy of preparing for increasing competition.*

In many parts of the world, Roundup *is subject to direct competition because of patent expiration. In the United States, the product's "method of use" patent offers protection into 1991, and its "composition of matter" patent remains in effect into the year 2000.*

To prepare for patent expirations, MAC increased volumes and lowered unit costs and selling prices for Roundup.

"We see good growth for Roundup *in the years ahead," says Robert B. Shapiro, executive vice president, Monsanto Company, and president, MAC. "We intend to build on our cost and marketing advantages to help this great product achieve its full potential."*

Meanwhile, the new-product pipeline is ready to provide new revenue streams. Dimension *herbicide, which kills crabgrass without harming desirable grasses, is awaiting regulatory approval in the United States.*

Other products on track for commercialization include a herbicide for transplanted rice; a fungicide for rice, peanuts and turf; and a chemical hybridizing agent for wheat.

Bovine somatotropin (BST) has proceeded slowly through regulatory channels. Once approval is granted, this biotechnology-derived product should improve the efficiency and profitability of dairy farmers.

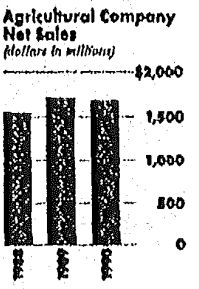
In the area of plant biotechnology, insect-resistant cotton will be the first of more than a dozen genetically improved crops that MAC plans to bring to market in the 1990s.

MAC reorganized in 1990 along product lines. In addition to focusing attention on product lines, the new structure will result in a lower cost base for MAC as it enters a new phase of product introduction.

"It's our job to supply the technologies that will help growers provide better foods at lower costs to more people, using methods that are environmentally sound," says Shapiro. "And that's just what our new products in the 1990s are going to do."



Next from the Agricultural unit's pipeline is Dimension herbicide for control of crabgrass. Crabgrass on the left was treated with Dimension; crabgrass on the right was not.



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The word is out: Monsanto has harvested a crop of insect-resistant cotton. Farmers are calling to ask when they can buy it. A new agricultural age has begun—the age of commercial biotechnology.

Insect-resistant cotton by Monsanto should aid farmers, such as Brian Cobb of Texas, and the environment by reducing insecticide use.



In the spring of 1990, a researcher planted a cotton patch in central Texas, just as neighboring cotton farmers have done all their lives. In the fall, he harvested his crop just as everybody else did.

In between, however, he left out a customary step. He didn't spray to kill the caterpillar larvae of destructive insects such as the cotton bollworm and the tobacco budworm.

Why? Because the seeds he had planted were genetically improved by Monsanto to resist these specific insects.

Similar field trials were conducted across the U.S. cotton belt. Experimental crops were planted in Alabama, Arizona, California, Louisiana and Mississippi.

At harvest time, insect damage was measured. The Monsanto cotton showed only 4 percent insect damage, compared with 31 percent damage in the untreated control group.

This new breed of cotton has demonstrated the potential to eliminate 35 to 40 percent of total insecticide use for the fifth-largest crop in the United States. At that rate, the use of chemicals by U.S. cotton farmers would be reduced by almost 6 million pounds.

Word spread quickly throughout the farming community.

"I get phone calls from cotton farmers asking me how soon they can get seeds of insect-resistant

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cotton for planting," says Dr. Robert T. Fraley, director, plant science technology, Monsanto Agricultural Company (MAC).

"If you're a Mississippi cotton farmer, you spray your fields seven to 10 times during the growing season to control insects. But you still lose 10 to 15 percent of your crop. Insect-resistant cotton offers these farmers the promise of less insecticide use, higher yields and lower costs."

Monsanto will license the crop gene to the leading cotton seed companies, which will sell the seed. This type of marketing is a new experience for Monsanto, but, within the seed industry, interest is high.

The specific gene that provides insect resistance in cotton should work just as well in other crops, such as corn.

However, corn is a monocot. It sprouts with one seed leaf as opposed to dicots such as cotton, which sprout with two seed leaves.

Plant biotechnologists had difficulty transferring genes into corn until 1990, when Monsanto and the U.S. Department of Agriculture announced their success. Genetically improved corn cells have now been nurtured into fertile corn plants in Monsanto's St. Louis laboratories.

This scientific breakthrough should speed the introduction of valuable new traits into corn and other monocots, such as wheat and rice. Scientists are already developing the technology to make corn insect-resistant.

"One of the biggest unmet needs in a major crop is controlling the European corn borer," Fraley says. "In this case, we won't be displacing chemicals; we'll be creating a way to control an important pest the farmer has not been able to control before."

Insect-resistant cotton will be the first genetically improved crop to be submitted by Monsanto for regulatory approval. "By the mid- to late 1990s, we hope to receive approval for more than a dozen different combinations of crops and genetic traits," says Milton P. Wilkins, vice president, plant sciences division, MAC.

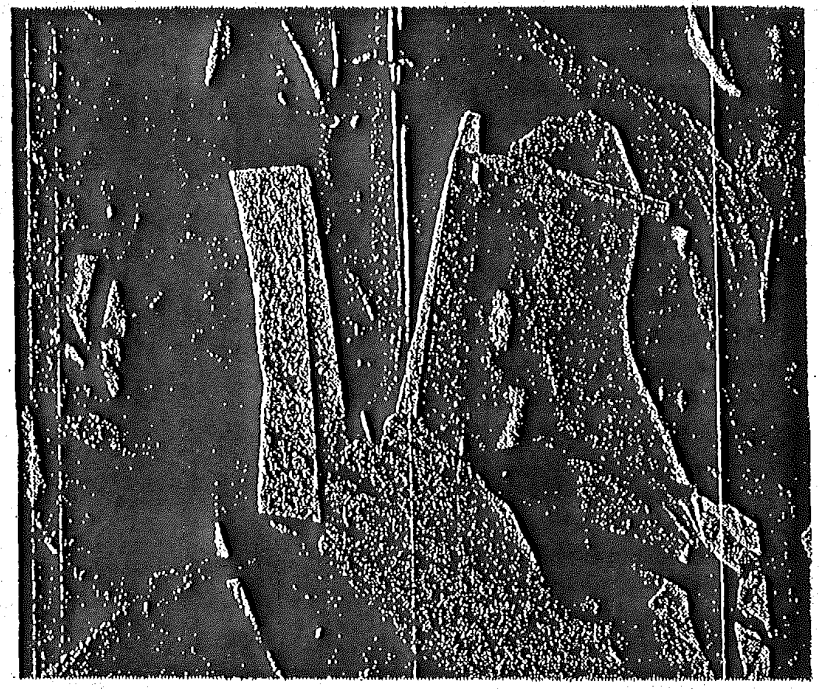
Some of them will provide pest control; some, disease control. Others will provide better taste, storage potential or nutritional qualities. Still others will provide tolerance to *Roundup* herbicide. All of them will be the products of a revolutionary, world-class science.

"We're looking at a technology that has the ability to reorder the markets it's applied to," Wilkins says, "not merely to compete, but to reorder marketing competition, cost competition, price competition.

"It has the potential to make much of what has come before obsolete. We're talking about a fundamental change that will create important new choices for growers, processors and consumers."

Wilkins adds: "If you consider the overall food demands of the next five, 10, even 40 years, and the desire to continue the move toward an increasingly clean environment, plant biotechnology offers a realistic promise of meeting those needs.

"This is a timely technology, geared to the most fundamental worldwide needs and demands. And Monsanto is considered one of the worldwide leaders in this field."



Corn plants grown in Monsanto greenhouses were among the first in the world to accept genes introduced by scientists and to pass those genes on to the next generation of corn plants.

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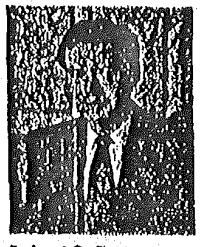


Robert G. Potter, executive vice president, Monsanto Company, and president, Monsanto Chemical Company.

Monsanto Chemical Company

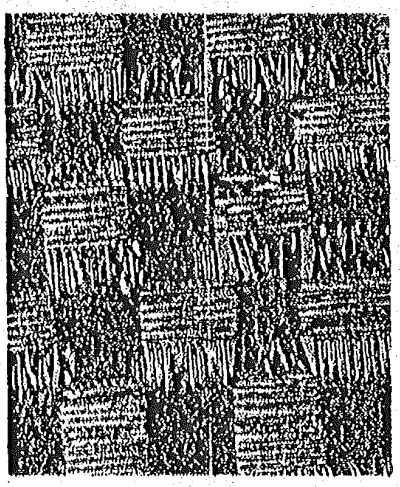
MCC builds a five-year growth record with high-performance products, targeting new growth from existing resources.

Monsanto Chemical Company (MCC) is a $4 billion business that provides the largest percentage of Monsanto Company's sales. MCC makes and sells market-leading products in fibers, resins, plastics, detergent ingredients and phosphates, rubber and process chemicals, and specialty chemicals.

The current product mix is the outcome of a strategic decision in 1985 to get out of commodity petrochemicals and to concentrate on products that provide value to customers beyond the sum of their raw-material components.

"For example," says Robert G. Potter, executive vice president, Monsanto Company, and president, MCC, "we don't sell Saflex *interlayer based on the cost of the resins required to make the sheet.*

"We sell the value of a system that allows the customer to have a laminated windshield or architectural glass that offers safety, acoustic protection and sun filtration.



The latest family of Chemical Company products, *Electron* metallized materials, uses proprietary technology for applying thin metal coatings to fabrics, fibers and films.

"The value of our products is determined by the way they perform in our customers' final products."

The results generated by this portfolio of high-performance materials speak for themselves: five years of sales growth in continuing businesses at 7 percent compounded annually, new-product research and development spending three times what it was in 1985, $300 million a year in capital reinvested in manufacturing facilities, and an average of 15 new products introduced each year.

However, results in 1990 didn't keep pace with results in the previous four years because of two negative factors.

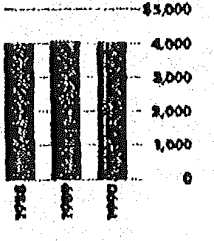
The Iraqi invasion of Kuwait and the ensuing rise in oil prices led to runaway costs for MCC's most-used raw materials, propylene and benzene, both of which are petroleum derivatives.

Also, the recessionary economy in the United States slowed demand for many MCC products.

Despite these negative external forces, MCC perceives no inherent long-term weaknesses in its existing product portfolio. MCC is targeting new growth opportunities through knowledge-intensive ventures, as opposed to the capital- and people-intensive initiatives that had been the rule in the past.

MCC's intellectual insight will be coupled with existing resources inside and outside the company to deliver new products, new markets, new technologies and an expanded global presence throughout the 1990s.

Chemical Company Net Sales
(dollars in millions)



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Relying on technical knowledge, existing resources and strategic alliances, Monsanto Chemical Company finds new growth opportunities to reach global markets with high-performance products.

On Jan. 1, 1986, Monsanto Chemical Company (MCC) took its place in the restructured corporate lineup.

With approximately half the corporation's sales, MCC's task was to be highly profitable immediately. It met that goal in the first year. By the end of 1989, MCC had put together four years of exceptional performance. During that time, many new opportunities had been identified outside the company's core businesses.

Because of its success, MCC asked for and received the corporate go-ahead to reinvest its excess cash in its own growth initiatives.

"But growth can be expensive and time-consuming," says Robert G. Potter, executive vice president, Monsanto Company, and president, MCC. "A new plant, for example, can cost millions of dollars to build and take three years to bring on-line."

But MCC's customers didn't want to wait years for new products to become available.

Alliances have allowed MCC to grow while minimizing costs, maximizing speed and strengthening its competitive position.

For these reasons, the company began to target new growth through joint ventures and alliances. These collaborative efforts have provided a wide range of benefits.

In basic research, MCC is working with four laboratories in the Soviet Union to develop a thin protective surface that can be applied to MCC plastics.

The surface will be as hard as diamonds, slicker than ice, more heat-conductive than copper and as transparent as glass.

"There's no way we could afford this solely as an internal program," says Dr. Robert E.W. Jansson, director, technology, advanced performance materials.

"We bought 20 years of experience from a pioneer in the technology. Because we're moving so fast, we should have product prototypes in 1991. We expect it to be a considerable business."

For product development, MCC has entered into a strategic alliance with Vista Chemical Company to create products that combine the raw-material strengths of both companies.

The first product of this alliance is *Triax* CBE\1, a flame-retardant plastic for use in business machine enclosures.

MCC began marketing this product in 1990, and at least two global computer manufacturers have already specified *Triax* CBE\1 for their computer and printer housings.



Near their lab in Kiev, Soviet researchers display a surface coating being developed with Monsanto.

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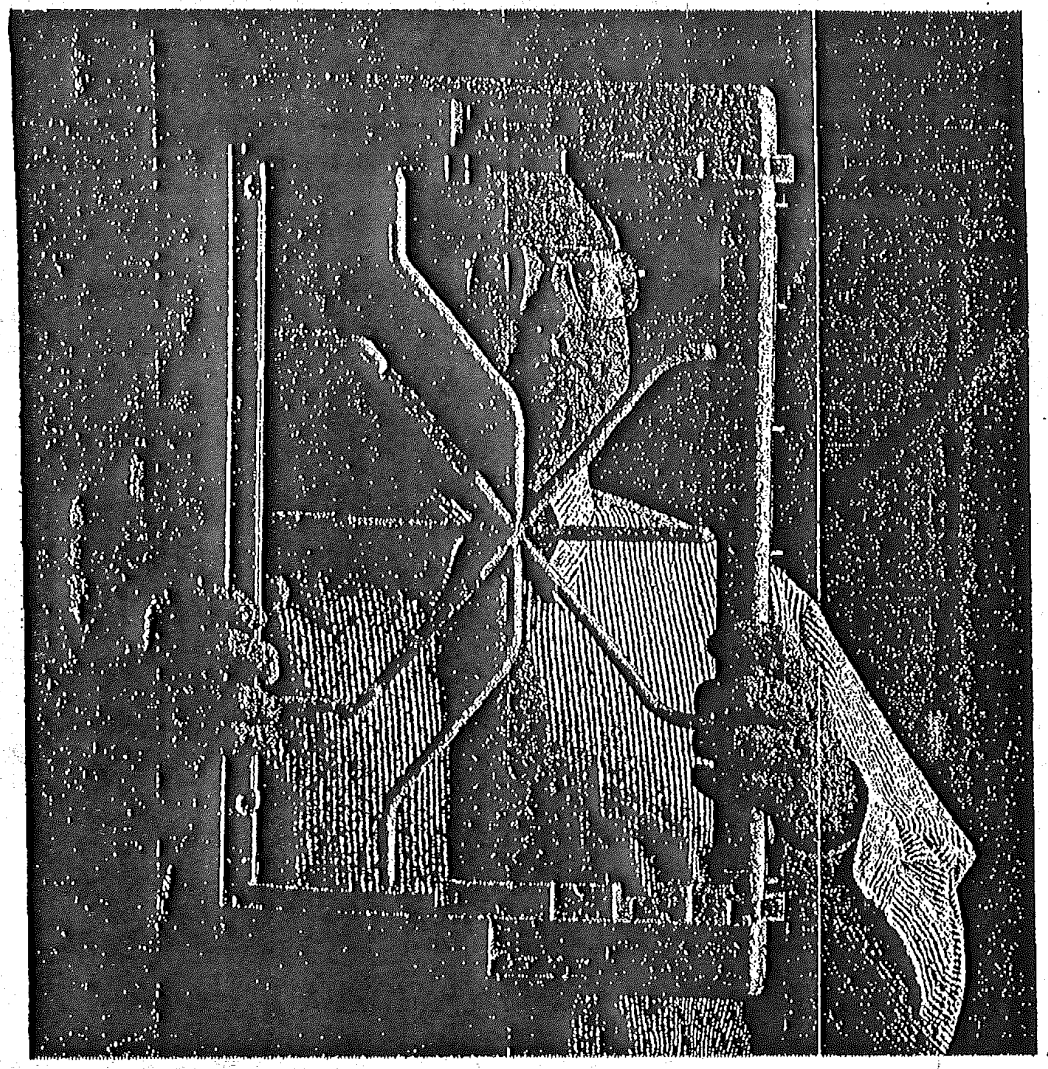

Monsanto and Vista Chemical Company worked together to produce a flame-retardant plastic alloy used in products such as this computer printer housing.

For new market access, MCC entered a 50/50 joint venture with Toray Industries Inc. of Tokyo in 1990.

Called Montor Performance Plastics Company, the new venture supplies nylon compounds to the North American manufacturing arms of Japanese automobile companies.

Montor combines MCC's North American manufacturing and product strengths with Toray's long-standing supplier relationship with Japanese carmakers.

MCC spent much of 1990 negotiating a joint venture to merge the thermoplastic elastomer (TPE) businesses of MCC and Exxon Chemical Company. The new stand-alone company is called Advanced Elastomer Systems, L.P.

TPEs are substances that combine the properties of rubber with the moldability of plastic. They are used in products as diverse as under-the-hood parts in automobiles and plunger tips for hypodermic needles.

The venture combines Monsanto's proprietary position in the higher-performance end of the product line with Exxon's sources of raw materials and market-leading raw-material technologies.

The combined strengths of MCC and Exxon create a powerful entry in a field that is expected to attract intense global competition during the 1990s.

These and other cooperative efforts enable MCC to act on growth opportunities while minimizing costs, maximizing speed and strengthening its competitive position globally.

"We've proved," Potter says, "that we can be the foundation of the new Monsanto in profitability and cash generation, and be so successful at it that we can grow our own businesses at the same time.

"And by using existing resources instead of investing massive amounts of capital, we have the potential for a high return."

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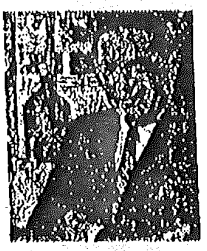


Sheldon G. Gilgore, M.D., chairman, president and chief executive officer, Searle.

Searle

Searle, fueled by a full product pipeline, is on schedule to become a top-tier pharmaceutical company by the mid-1990s.

Five years ago, the new management team at Searle set out to make the company one of the world's top-tier pharmaceutical providers by the mid-1990s.

Then the pharmaceutical world changed. Mergers, acquisitions and assorted business ventures created global giants from the ranks of ordinary pharmaceutical companies.

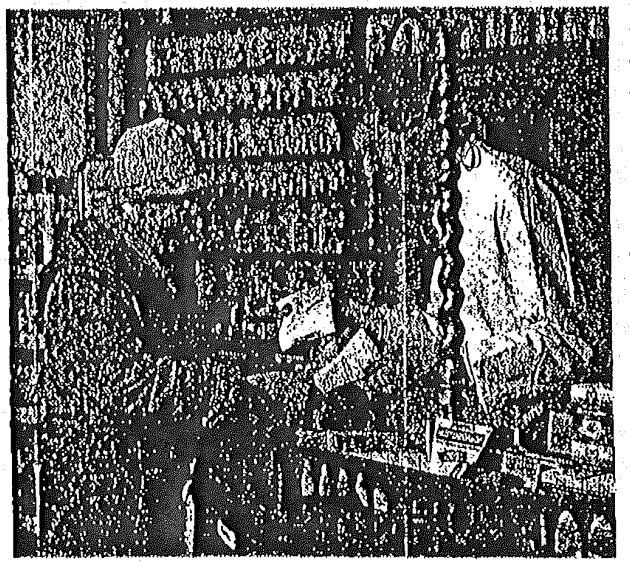
This development hasn't slowed Searle's advance on world-class performance and a leadership position.

"Our objective to reach the top tier is the reference point for everyone in this company," says Dr. Sheldon G. Gilgore, chairman, president and chief executive officer of Searle. "The main strategy and the best indication of that success is the development of a steady stream of important new therapeutic agents coming out of our product pipeline."

More than 10 major new products were in clinical trials at the close of 1990. Five others were pending regulatory approval to enter major markets.

Marketing approval is pending in Canada for Arthrotec, *a non-steroidal anti-inflammatory drug for arthritis with built-in protection against gastric ulcers. Regulatory filings for this product also were made in the United Kingdom, France and other European markets.*

Searle's presence in the important German pharmaceutical market is stronger since its acquisition of Heumann Pharma GmbH and Company.



Maxaquin, a once-a-day, quinolone-class antibiotic in the fastest growing segment of the anti-infective market, is pending marketing approval in the United States. It was also submitted for approval in Canada, the United Kingdom, France, Italy and 10 other countries.

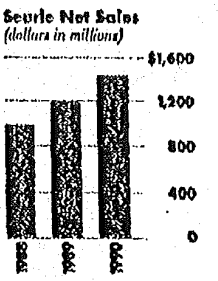
Acquisitions in Italy and Germany and an increase in ownership in our business in Japan have added to Searle's competitive presence in each of the seven largest geographical markets in the world. These critical pharmaceutical markets are the United States, Japan, France, Germany, Italy, the United Kingdom and Canada.

Searle's presence in these markets is supported by the company's emphasis on a combination of science and marketing.

"Science drives our marketing and the marketplace influences our scientific interests," says Gilgore.

With a full product pipeline, a growing presence in the key global markets, a productive interplay of science and marketing, and a management style that fosters innovation and entrepreneurial spirit, Searle is proceeding on schedule toward its goal of achieving $3 billion in annual sales by the mid-1990s.

"There's no question in my mind that we're well-positioned to attain that goal," says Gilgore.



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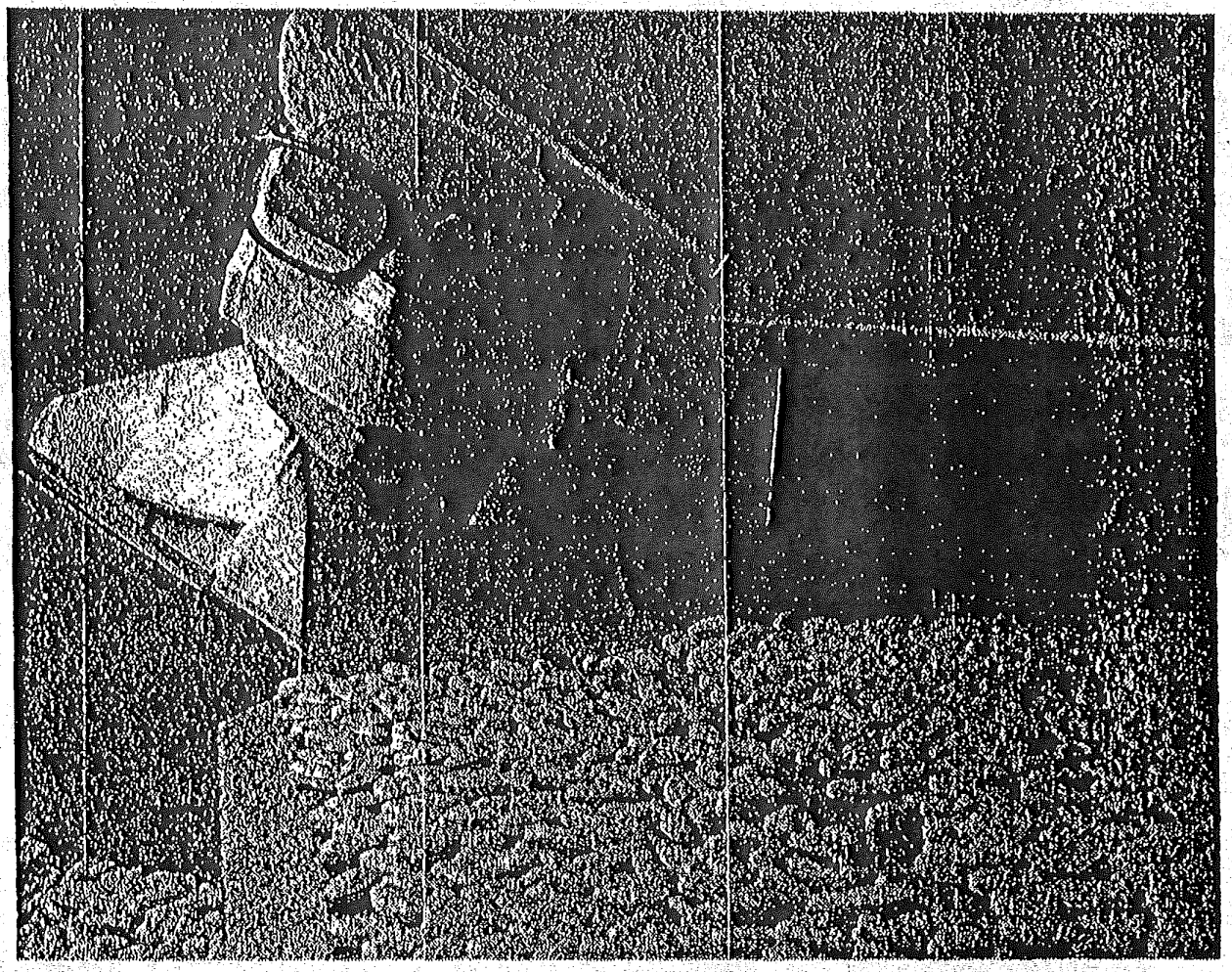
Searle's marketing power pulls its products through the pack with a little innovation here, a steady diet of the basics there.

Good science and good marketing combined to bring a new lower dosage of *Calan* SR antihypertensive drug, made in Puerto Rico, to market.



As *Kerlone* antihypertensive drug entered the U.S. market in 1990, it fulfilled the Searle objective of introducing at least one significant new product each year.

Kerlone is a long-acting, once-a-day beta blocker. It offers an advantage in addressing health problems that occur during the body's daily "waking up" process.

However, competition among beta blockers is strong. An innovative marketing program was required to help *Kerlone* break through the pack.

The result was *Patient Plus*, a program that offered *Kerlone* free of charge during the introductory period. Nothing like it had ever been done in the pharmaceutical industry.

"It really was unusual," says Dr. John Olivieri of Oak Lawn, Illinois. "Searle was the first pharmaceutical company to have a program like this. I've put a lot of people on *Kerlone* beta blocker, and I think they'll stick with it."

That kind of marketing innovation doesn't spring from a vacuum. At Searle, it builds from an effective, efficient, ongoing practice of basic marketing disciplines -- the kind of marketing strength that propelled *Calan* SR, a different type of antihypertensive drug, from introduction in 1987 to $432 million in U.S. sales in 1990.

Says Product Director Frederick

TOWOLDMON0015597

A. Howayeck, Jr.: "The best way to prove your worth is to do it with the patients that are toughest for a doctor to treat. That's exactly how we positioned the launch of *Calan* SR antihypertensive drug."

The physician's most difficult hypertension cases are the elderly and patients with high fluid retention. They were the bull's eye of the initial target audience for *Calan* SR calcium channel blocker.

In the launch phase, all advertising, medical education and sales force contact with physicians drove home the core message: *Calan* SR is an effective agent for the most difficult hypertension patient.

"Once we developed a niche for the most difficult patients, we expanded the positioning to all hypertension patients," says Howayeck.

Richard E. Hinson, vice president, marketing, United States, adds: "First you hit the bull's eye, then you work your way out through the rings of the target, taking your cues from the marketplace itself."

For example, in 1988, the U.S. Joint National Committee on the Detection, Evaluation and Treatment of Hypertension issued a set of recommendations for physicians who treat hypertension.

Among those recommendations: that calcium antagonists, such as *Calan* SR, should be added to the first line of agents to treat hypertension, and that the physician's goal should always be to use the fewest drugs at the lowest doses.

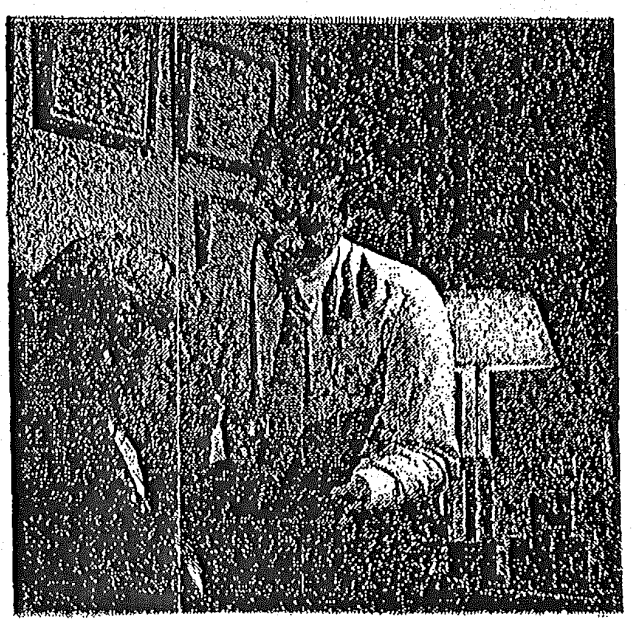
On the heels of those recommendations, *Calan* SR was repositioned as an appropriate first-line agent for mild hypertension, and development began on a lower dose/lower price line extension.

In March 1990, a 180-milligram (mg) version of *Calan* SR was introduced as the low-dosage alternative to the original 240-milligram dosage. In clinical studies, efficacy of the two dosages was similar.

"*Calan* SR 180 mg is now the primary product we promote," says Howayeck. "It's the optimal effective dosage for the majority of patients with mild hypertension and, therefore, fits nicely with the Joint National Committee recommendations."

"In four years, product positioning has evolved from focusing on the patients who are more difficult to treat to showing physicians how *Calan* SR is appropriate for a much broader array of patients, including those with mild hypertension," Hinson notes on the progress the product has made. "In essence, the product moved from the specialty niche to the broadest scope of hypertension cases."

Marketing innovation and marketing basics. Positioning and repositioning. Good science intertwined with good marketing. That is how Searle is moving toward the top tier of pharmaceutical companies.



More than 8,000 physicians, including Dr. John Olivieri of Illinois, have new patients on Korlone antihypertensive drug, first offered through Searle's *Patient Plus* program.

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The NutraSweet Company

The NutraSweet Company plans to maintain a powerful sweetener franchise while expanding to serve healthy lifestyles worldwide.



Robert E. Flynn, chairman and chief executive officer, The NutraSweet Company.

On Dec. 14, 1992, NutraSweet brand sweetener goes off patent in the United States. Thereafter, the most successful new food ingredient of the past 20 years will be subject to generic competition, as well as continuing competition from other sweeteners, in its largest market.

From the outset, The NutraSweet Company has adhered to a branded ingredient strategy as a way to make its sweetener stand out in a market that was destined to become more competitive. Today, the trademarks NutraSweet *and the* Swirl Logo *are recognized by 96 out of 100 consumers in the United States.*

"Our overwhelming strategic priority is to maintain a powerful sweetener franchise," says Robert E. Flynn, chairman and chief executive officer of The NutraSweet Company.

This priority is being advanced worldwide on every front:

• In customer service, by building a level of quality and responsiveness that takes the buying decision beyond price and availability.

• In marketing, by assisting customers to develop product formulations and by helping to steer them through the regulatory process.

• In manufacturing, by investing in process technology to solidify the unit's low-cost manufacturing position.

• In research and development, by working to develop the next generation of high-potency sweeteners.

There is a future beyond the sweetener business, too, as The NutraSweet Company moves toward its vision of being a healthy lifestyles company.

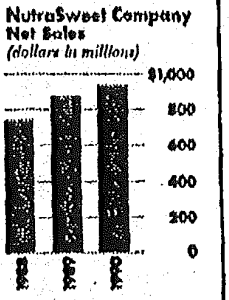
In 1990, the company introduced its second commercial product, Simplesse *all natural fat substitute, which can provide good taste with less fat and cholesterol in foods such as cheese, butter, salad dressing and yogurt.* Simple Pleasures, *a frozen dairy dessert that includes* Simplesse *as an ingredient, debuted as a low-fat, low-cholesterol, good-tasting alternative to super-premium ice cream.*

The company's line of Desserve *reduced-calorie desserts will be distributed on a test basis in 1991 by Mrs. Fields, the baked goods entrepreneur.*

Through these and other products, The NutraSweet Company expects to become known as the global leader in providing innovative food choices that contribute to healthier lifestyles.



The Fat Freedom Eskimo Pie Sandwich, enjoyed here by two St. Louis students, is the first frozen dairy dessert novelty to use Simplesse all natural fat substitute.



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The NutraSweet Company demonstrates an axiom of globalization: Think globally, act locally. This story began with a market short on immediate opportunity but long on potential.

The collective pulse of The NutraSweet Company's international marketing team quickened in 1987 as the members looked at Brazil and saw three indicators of market potential for *NutraSweet* brand sweetener.

Brazil was the third-largest consumer of carbonated soft drinks in the world. The population was youthful. And with 5,000 miles of beaches, body consciousness was widespread.

Only one thing was missing from The NutraSweet Company's checklist for market potential: a diet segment. In Brazil, diet products were sold only in pharmacies, only with a physician's prescription, and only with a large color bar across the label, as if to warn people away.

One of the lessons The NutraSweet Company learned as it pursued a strategy of globalization was that every area of the world has its own special circumstances. The company that shies away from unfamiliar problems will never be truly global.

So off to Brazil the company went, diet segment or not. There was, at least, already a Monsanto presence in the country.

Corporate Monsanto had opened its Brazilian offices more than 25 years before. With $200 million in annual sales, Monsanto's businesses were a growing component of the Brazilian economy.

There was no such thing as a diet segment in Brazil when The NutraSweet Company arrived.

For NutraSweet, Monsanto-Brazil associates provided corporate, legal, financial, human resources, administrative and manufacturing support. "If NutraSweet had had to start from zero here," says Francisco Céspede, Monsanto-Brazil's financial director, "it would have been much more difficult."

With the help of Monsanto-Brazil, The NutraSweet Company applied for government approval of *NutraSweet* brand sweetener as a food ingredient.

Approval was granted in August 1988, but not exactly the way the company wanted it. The rectangle logo with the red and white swirl for *NutraSweet* wasn't allowed to appear on products.

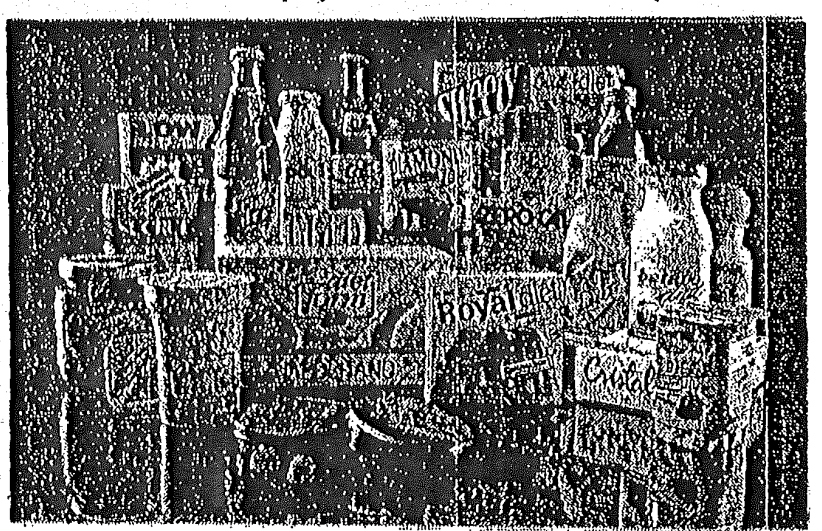
Without the ability to use the logo, the branded ingredient strategy of The NutraSweet Company — the very core of the company's approach to the market — couldn't be implemented.

A logo-approval campaign was the first order of business for the company's Brazilian business manager, Moses Benzaquen.

After a determined campaign led by Benzaquen, the logo for *NutraSweet* brand sweetener was approved for use on food labels in July 1989.

Soon, the *Swirl Logo* was everywhere — on billboards, on bumper stickers, on kites, even on a banner towed by an airplane over the renowned Brazilian beaches.

But there was more to Benzaquen's job than introducing this one product. As a food ingredient, *NutraSweet* brand sweetener requires diet products, which didn't exist in Brazil. Therefore, a top priority for Benzaquen



Since 1989, *NutraSweet* brand sweetener has become an ingredient in more than 150 Brazilian products.

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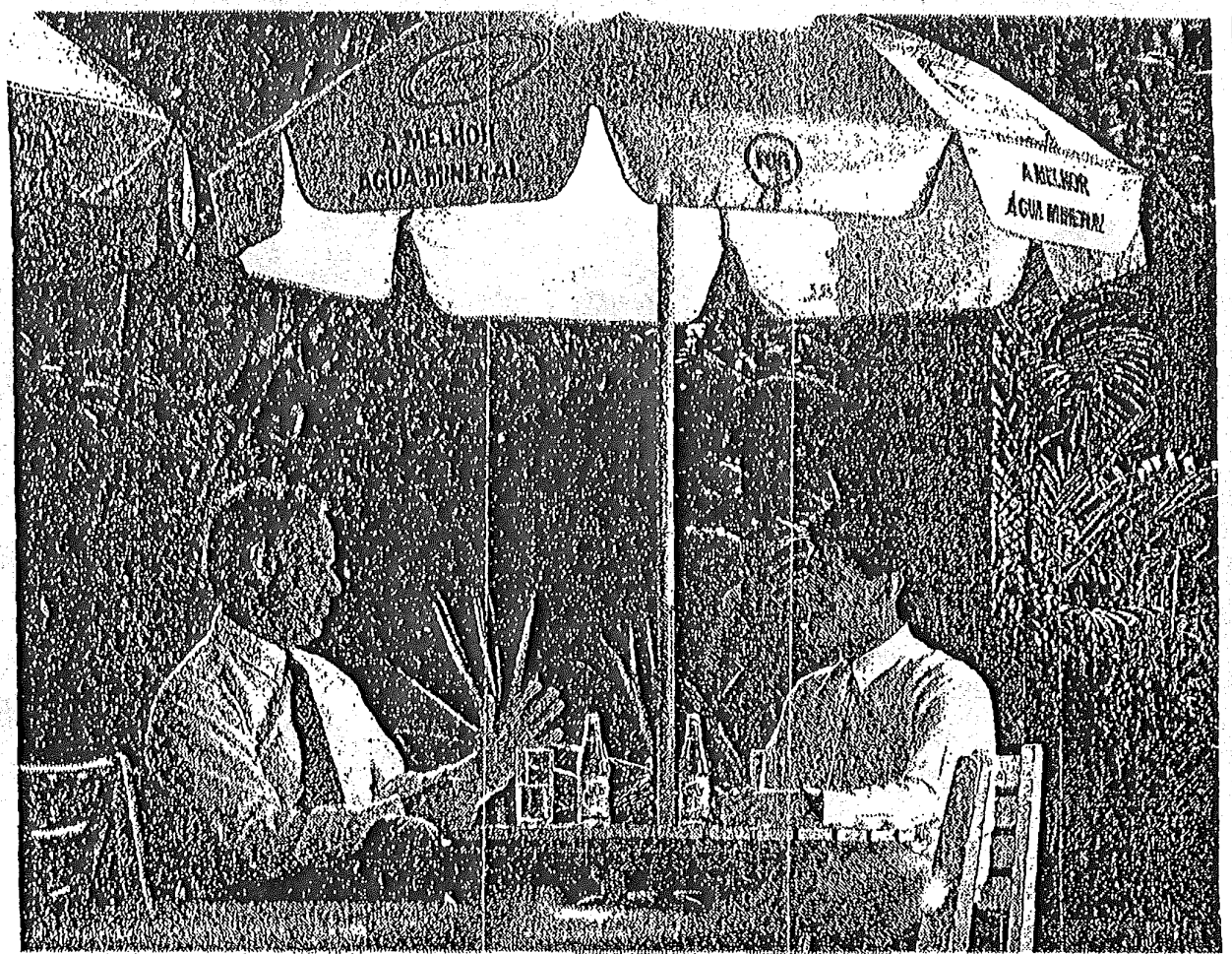

was to build a diet segment from zero. The beaches were no small part of the Benzaquen strategy.

He explains: "In the south of the country, people spend their vacations, their weekends, much of their leisure time on the beaches. In my opinion, Brazil is a country where people are most concerned about their personal appearances.

"So if you show up with a new product and tell people that the taste is the same as sugar and they'll be avoiding a lot of calories, it's not hard to persuade them to change."

By the end of 1990, the Brazilian diet segment included 150 products in 14 categories that use 100 percent *NutraSweet* brand sweetener.

Sales of *NutraSweet* brand sweetener have grown dramatically, more than doubling since logo approval. Expectations are high for 1991 because of anticipated conversions of major carbonated soft drink brands to formulations using 100 percent *NutraSweet*.

In May 1990, The NutraSweet Company also opened its first production facility outside the United States — in São José dos Campos, Brazil.

This plant can supply 100 metric tons of *NutraSweet* brand sweetener annually to a growing family of good-tasting, low-calorie products that didn't exist until The NutraSweet Company found a way to execute its global strategy in a country without a diet segment.

Francisco Céspede (left) and Moses Benzaquen are part of the team that made *NutraSweet* brand sweetener a key ingredient in such Brazilian products as Diet Dolly, the first soft drink in Brazil to use 100 percent *NutraSweet*.

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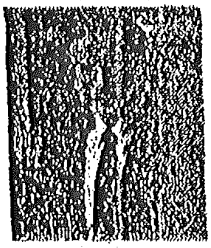
Fisher Controls International

Fisher demonstrates its value to Monsanto with strategic significance and financial performance.



Larry W. Solley, chairman, president and chief executive officer, Fisher Controls International.

Why is a company that makes and sells valves and instrumentation part of the Monsanto strategy?

That question has been asked about Fisher Controls International many times since the Monsanto restructuring in 1985. The answer, which may have preceded the evidence, is that Fisher remains a part of Monsanto because it fits strategically, and it works financially.

Fisher has strengthened the financial part of the answer by steadily improving its return on capital (ROC), moving two or three percentage points a year toward its target.

"There is no question that we are on track to achieve our 20 percent ROC objective," says Larry W. Solley, chairman, president and chief executive officer of Fisher Controls. In 1990, ROC was 13.4 percent.

The strategic part of the answer is gaining strength on several levels.

First, Fisher has moved away from being overreliant upon one industry — in this case, oil and gas. Before, when oil and gas had a bad year, Fisher's results suffered too. The company continues to be a major supplier in oil and gas, but it has increased its scope to a cross section of industries that offers both growth and stability.

Second, the growing emphasis on continuous quality improvement at Fisher as well as at other Monsanto operating units blurs the line between supplier and customer. Fisher and Monsanto Chemical Company, in particular, have jointly pioneered manufacturing solutions that Fisher now markets to other industries.

Third, Fisher's presence around the world supports Monsanto's objective to be a global corporation.

Solley says, "Everyone talks about being global, but we really are." Fisher backs that claim with worldwide sales and service offices, manufacturing facilities and educational centers.

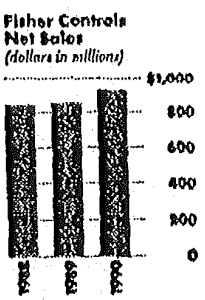
Fourth, Fisher's undisputed top position worldwide in control valves and its leading position in segments of the instrumentation business support Monsanto's commitment to market leadership.

And fifth, Fisher's growing family of value-added, problem-solving products brings it increasingly in line with Monsanto's strategy for a performance-oriented, high-margin portfolio of businesses.

It does work, and it does fit.



Pulp and paper mills, such as Canadian Pacific Forest Products in British Columbia, are key markets for Fisher Controls' PROVOX instrumentation.



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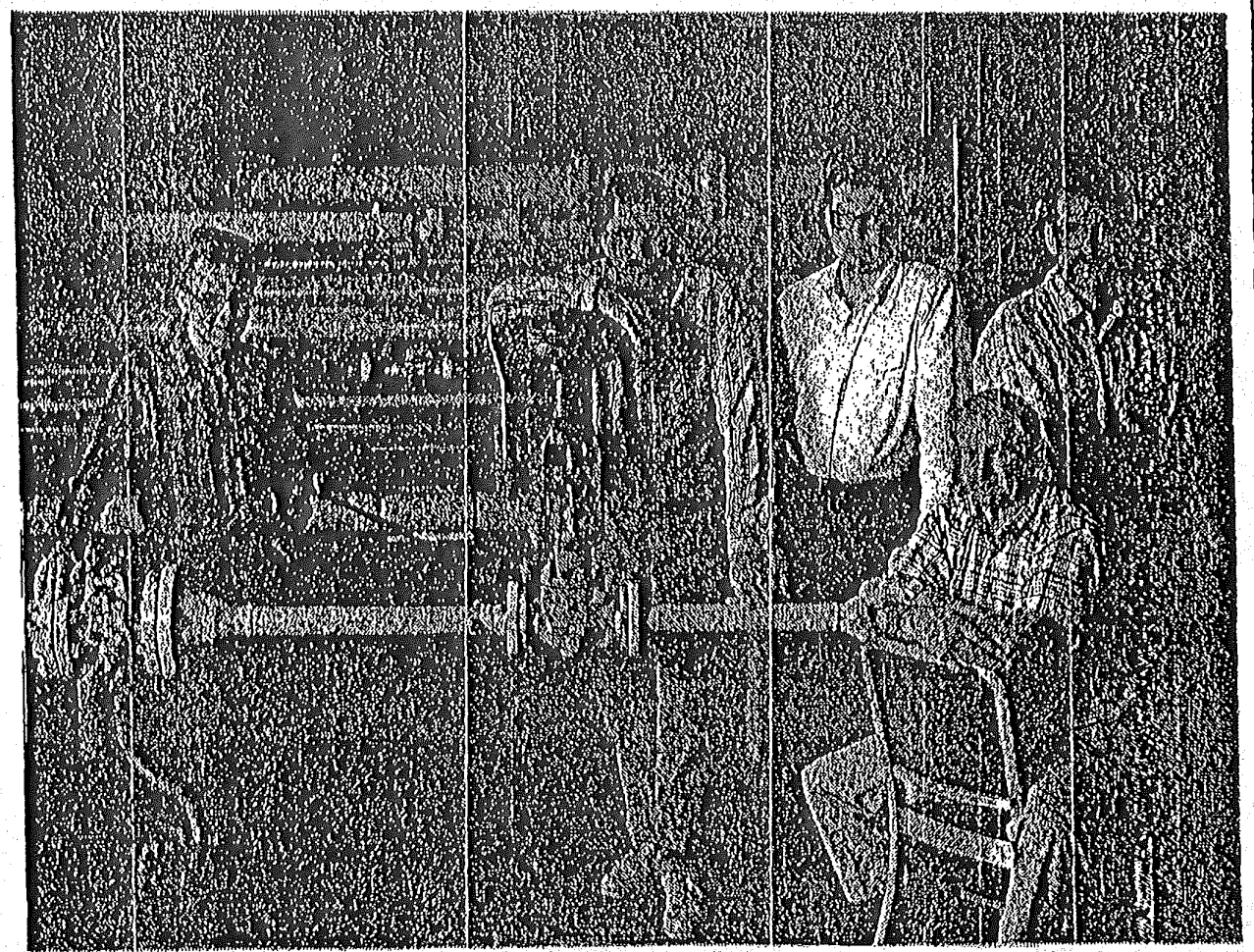
Using time as a competitive advantage, Fisher Controls International announces a new product in advance of the regulations it's designed to address.

Fisher employees saw the chance to turn new environmental regulations into a market opportunity.



The U.S. Clean Air Act Amendments, signed into law by President George Bush in November 1990, carry an estimated cost of compliance of $25 billion annually by the year 2005.

Though an expense to industry, those dollars also represent potential income to the companies that will provide the means to meet the law's requirements.

Before the new requirements became law, before they were even voted upon by the U.S. Congress, representatives from Fisher Controls International were attending open meetings of a committee formed to develop standards for "fugitive emissions" of hazardous air pollutants as part of the final clean air regulations.

Fugitive emissions are those gases that escape in minute amounts from the seals of any pump, valve or flange.

Current regulations issued by the U.S. Environmental Protection Agency (EPA) require that leaking pumps, valves or flanges be repaired if organic fugitive emissions to the atmosphere are 10,000 parts per million or greater.

New regulations to be issued under the Clean Air Act Amendments will require that such equipment be repaired if fugitive emissions of any chemical identified as hazardous by the EPA are 500 parts per million or more, a reduction of 95 percent. Also, the number of hazardous air pollutants was increased from eight to 189.

Here's what that means: If you

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operate a plant with potential fugitive emissions of any hazardous air pollutant, you will be required to test every pump, valve and flange to determine whether repairs are required.

In January 1990, Fisher's industry managers for the chemical industry, Meredith Miller and Bruce Gramstrup, began attending the open sessions about the standards.

Miller and Gramstrup were only the tip of the Fisher iceberg. They were feeding timely information to a specially organized team of design engineers, drafting professionals, lab engineers and technicians, and marketing professionals.

They had the backing of management to do whatever was necessary to develop a new control valve that would reduce fugitive emissions to meet the new standards.

The objective wasn't extraordinary, but the timing was. Fisher was actually developing the product in parallel with the negotiations over the standard.

The result: In September 1990, at the control valve industry's major trade show of the year, Fisher announced newly modified valves designed for compliance with regulations to be issued under the new law.

"What we've done in 1990 will ultimately differentiate the company in the customer's eyes," Miller says,

Fisher managers saw change coming and leaped beyond responding to customer needs to anticipating them.

"both because of the technical products and services we provide and because of the understanding we have of the customer's requirements. This is indicative of the positioning of Fisher Controls for the 1990s."

Some credit for the speed of these developments can be given to a pair of prominent strategic concepts at Fisher: concentration on key industries and an ongoing quality effort.

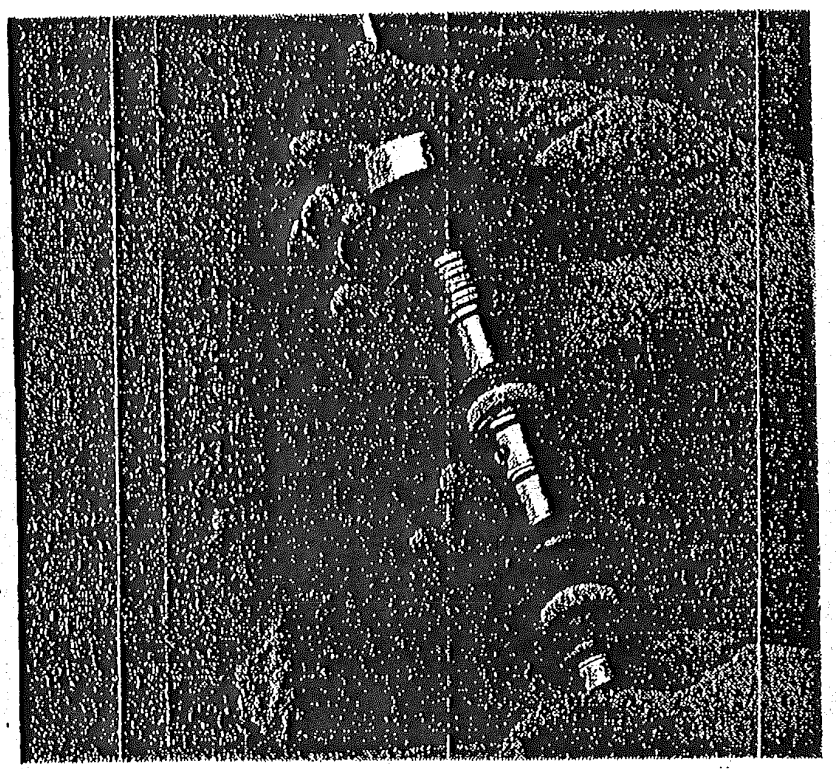
In this case, Fisher's chemical industry managers looked beyond customer requirements to their source, the EPA, and saw change coming. They no longer merely responded to customer needs; they anticipated them.

The potential market for new fugitive emission control valves from Fisher is huge. Everyone who processes anything on the EPA's list of hazardous air pollutants will have to comply with the new standards.

Fisher initially will have the only control valves specifically designed to meet the new EPA standards for fugitive emissions, which means Fisher products will be specified in the design phase of new projects.

The scope of Fisher's market potential includes the entire installed base of control valves that handle hazardous air pollutants, as well as all new construction in this field.

It all happened thanks to a customer focus that not only adapts to change, but gets to the source of it.



A new *Enviro-Seal* packing system in a Fisher control valve enables processing plants to achieve drastic cuts in emissions that can escape around valve seals.

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Unless otherwise indicated by the context, "Monsanto" means Monsanto Company and consolidated subsidiaries, and "the Company" means Monsanto Company only. All dollars are in millions, except per share data.

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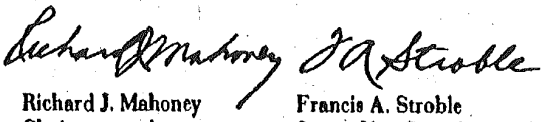
MANAGEMENT REPORT

Monsanto Company management is responsible for the fair presentation and consistency of all financial data included in this Annual Report in accordance with generally accepted accounting principles. Where necessary, the data reflect management's best estimates and judgments.

Management also is responsible for maintaining a system of internal accounting controls with the objectives of providing reasonable assurance that Monsanto's assets are safeguarded against material loss from unauthorized use or disposition and that authorized transactions are properly recorded to permit the preparation of accurate financial data. Cost-benefit judgments are an important consideration in this regard. The effectiveness of internal controls is maintained by: (1) personnel selection and training; (2) division of responsibilities; (3) establishment and communication of policies; and (4) ongoing internal review programs and audits. Management believes that Monsanto's system of internal accounting controls as of December 31, 1990 is effective and adequate to accomplish the above described objectives.



Richard J. Mahoney
Chairman and
Chief Executive Officer

Francis A. Stroble
Senior Vice President and
Chief Financial Officer

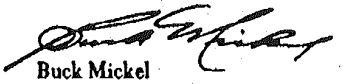
February 22, 1991

AUDIT COMMITTEE REPORT

The Audit Committee is composed of five non-employee members of the Board of Directors and met four times in 1990. It reviews and monitors Monsanto's internal accounting controls, financial reports, accounting practices and the scope and effectiveness of the audits performed by the independent auditors and internal auditors. The Committee also recommends to the full Board of Directors the appointment of Monsanto's principal independent auditors and approves in advance all significant audit and non-audit services provided by such auditors. As ratified by shareowner vote at the 1990 Annual Meeting, Deloitte & Touche were appointed as independent auditors to examine, and express an opinion as to the fair presentation of, the consolidated financial statements. This opinion follows.

The Audit Committee discusses audit and financial reporting matters with representatives of the Company's financial management, its internal auditors and Deloitte & Touche. The internal auditors and Deloitte & Touche meet with the Committee, with and without management representatives present, to discuss the results of their examinations, the adequacy of Monsanto's internal accounting controls and the quality of financial reporting. The Committee encourages the internal auditors and Deloitte & Touche to communicate directly with the Committee.

The Audit Committee has reviewed the financial section of this Annual Report. Pursuant to the recommendation of the Committee, the Board of Directors has approved the financial section.



Buck Mickel
Chairman, Audit Committee

February 22, 1991

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INDEPENDENT AUDITORS' OPINION

To the Shareowners of Monsanto Company:

We have audited the accompanying statement of consolidated financial position of Monsanto Company and Subsidiaries as of December 31, 1990 and 1989, and the related statements of consolidated income, shareowners' equity and cash flow for each of the three years in the period ended December 31, 1990. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, such consolidated financial statements present fairly in all material respects the financial position of Monsanto Company and Subsidiaries at December 31, 1990 and 1989, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 1990, in conformity with generally accepted accounting principles.

Deloitte & Touche

Deloitte & Touche
Saint Louis, Missouri

February 22, 1991

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STATEMENT OF CONSOLIDATED INCOME

(Dollars in millions, except per share)	1990	1989	1988
Net Sales	$8,995	$8,681	$8,293
Cost of goods sold	5,366	5,035	4,972
Gross Profit	3,629	3,646	3,321
Marketing expenses	1,270	1,154	1,013
Administrative expenses	523	516	474
Technological expenses	692	672	648
Amortization of intangible assets	235	226	231
Operating Income	909	1,078	955
Interest expense	(179)	(182)	(174)
Interest income	52	57	46
Other income — net	27	62	66
Income Before Income Taxes	809	1,015	893
Income taxes	263	336	302
Net Income	$ 546	$ 679	$ 591
Earnings per Share	$ 4.23	$ 5.01	$ 4.14

The above statement should be read in conjunction with pages 42 through 47 of this report.

KEY FINANCIAL STATISTICS	1990	1989	1988
Percent Change from Prior Year:			
Net Sales	4%	5%	9%
Operating Income	(16)	13	30
Net Income	(20)	15	36
Earnings per Share	(16)	21	47
As a Percent of Net Sales:			
Gross Profit	40	42	40
Marketing, Administrative and Technological Expenses	28	27	26
Research and Development Expenses	7	7	7
Operating Income	10	12	12
Net Income	6	8	7
Effective Income Tax Rate	33	33	34
Return on Shareowners' Equity	13.6	17.6	15.4

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NET INCOME BELOW EXPECTATIONS, BUT STILL THIRD BEST

While 1990 net income was below management's earlier expectations, it represented the third-best net income and the second-best earnings per share year in Monsanto's history. Net income in 1990 declined 20 percent and earnings per share decreased 16 percent compared with that of 1989. The decline in net income was caused by dramatically higher costs for petrochemical-based raw materials during the latter part of the year, extreme weather conditions in key world agricultural markets and, to a lesser extent, depressed automotive and construction industries in North America. However, Pharmaceuticals, Fisher Controls and NutraSweet had record performances in 1990. Although benefiting from Monsanto's treasury stock purchase program, return on shareowners' equity (ROE) was lower than that of 1989. Notwithstanding the fact that ROE declined to 13.6 percent in 1990, management's goal of reaching and sustaining a 20 percent ROE remains unchanged.

NET SALES SET RECORD

Net sales set a record for the fourth consecutive year, up 4 percent in 1990. Sales volume increased 2 percent. The selling price increase was entirely due to the effect of translating non-U.S. dollar denominated sales into a generally weaker U.S. dollar. Net sales in markets outside the United States continued to be significant and represented 42 percent of Monsanto's 1990 total net sales.

Monsanto's worldwide sales growth was led by Pharmaceuticals, largely as a result of growth in the family of *Calan* calcium channel blockers (up 28 percent) and *Cytotec* ulcer preventive drug (up 52 percent). Fisher Controls net sales increased with higher selling prices and sales volume. Sales volume of *NutraSweet* brand sweetener increased 11 percent, while average selling prices decreased 6 percent. Sales volumes of Agricultural Products were hurt by adverse weather conditions. In addition, selling price reductions for *Roundup*, a glyphosate-based herbicide, were implemented, principally in Europe. Despite the effect of adverse weather conditions, worldwide sales volume of *Roundup* was slightly above that of 1989. Chemicals net sales were about level with the prior year. Chemicals benefited from continued strong European business, but was hurt by lower demand caused by the depressed North American automotive and construction industries.

UNUSUAL EVENTS UNFAVORABLY AFFECT OPERATING INCOME

Operating income declined 16 percent in 1990. Operating results were helped by improvements in sales volume and mix. However, higher raw material and other manufacturing costs, lower manufacturing capacity utilization and a 10 percent increase in marketing expenses reduced earnings compared with 1989's. The higher marketing expenses were concentrated on NutraSweet's *Simplesse* all natural fat substitute and *Simple Pleasures* frozen dairy dessert and on Pharmaceuticals product launches.

As mentioned above, net sales increased, in part, because of the effect of translating non-U.S. dollar denominated sales into a generally weaker U.S. dollar. Conversely, part of the increase in manufacturing costs and marketing and administrative expenses is the result of the same currency translation effect.

Agricultural Products operating income declined primarily due to the modest sales volume growth in glyphosate herbicides not compensating for the reductions in selling prices for those products. In addition, Agricultural Products operating income was hurt by low use of new manufacturing capacity and higher raw material costs. Chemicals operating income was hurt by increased costs of petroleum-based raw materials, lower sales volume and lower manufacturing capacity utilization. Pharmaceuticals operating income improved as a result of the continued sales volume growth. Fisher Controls operating income surged 48 percent as a result of selling price improvements, strong customer demand and improved production turnaround of booked orders. NutraSweet operating income increased slightly, as the benefit of higher sales volume was reduced by costs associated with new product introductions and lower average selling prices.

"Other income — net" decreased in 1990, due primarily to higher 1990 currency losses and higher losses from affiliated companies in which Monsanto does not have management control. Gains from divestitures in 1990 were comparable to those of the prior year. A $45 million pretax gain ($31 million after-tax, or $0.24 per share) on the sale of certain assets of a Monsanto joint venture in Japan was the principal divestiture in 1990.

COMMITMENT TO NEW PRODUCT DEVELOPMENT CONTINUES

New product development and commercialization continues to be the most important strategic priority for Monsanto. Research and development expenditures were $612 million in 1990, 7 percent of net sales, a significant level which management believes reflects its strong, long-term commitment to research and development. A major focus continues to be the discovery and development of pharmaceutical and agricultural products. Research in existing product technology and new applications also continues across all business units. University collaborations and opportunities for licensing are an integral part of Monsanto's research program. The result is that Monsanto has more potential products in the research and development pipeline now than at any other time in its history.

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PRIOR YEAR REVIEW – 1989 WAS RECORD YEAR

Monsanto net sales and earnings reached record levels in 1989. Net sales increased, principally from higher sales volume (up 9 percent for retained businesses), as demand was strong across most business and geographic markets. *Roundup* and other glyphosate herbicides experienced a 25 percent worldwide sales volume increase, more than compensating for the effect of selling price reductions. Net sales of the family of *Calan* calcium channel blockers grew about 50 percent. Strong consumer demand for *NutraSweet* brand sweetener resulted in 20 percent worldwide volume growth. Chemicals 1989 net sales remained strong. Fisher Controls net sales were level with 1988, but excluding divestitures, net sales grew 14 percent on continuing operations.

Chemicals, Fisher Controls and Pharmaceuticals selling prices increased, while selling prices declined for glyphosate-based herbicides, *Alimet* animal feed supplement and *NutraSweet* brand sweetener. Selling price increases generated $29 million in additional sales revenue, in spite of the $131 million adverse effect of translation of sales denominated in other currencies into a generally stronger U.S. dollar.

Operating income was a record $1,078 million in 1989, the fourth consecutive year of improvement. Monsanto's improved sales mix was principally responsible for the higher operating income because a larger portion of sales were from higher-margin products in the Agricultural Products, NutraSweet and Pharmaceuticals units. Higher selling prices and lower raw material costs also contributed to the improvement. Fisher Controls operating income in 1989 was more than double its 1988 income. Agricultural Products, Chemicals, NutraSweet and Pharmaceuticals had record operating income from continuing businesses.

Marketing expenses increased in 1989 due to greater sales through commission agents, higher promotional expenditures and higher costs associated with product introductions. Administrative expenses in 1989 increased, principally due to the higher cost of various employee incentive programs and, to a lesser extent, inflation.

Other income was down slightly in 1989 compared with that of 1988. The effect of higher currency losses and lower miscellaneous income exceeded the benefit of significantly higher gains from 1989 divestitures. The principal 1989 divestiture gain was the analgesics business, which resulted in a pre-tax gain of $56 million ($36 million after-tax, or $0.27 per share).

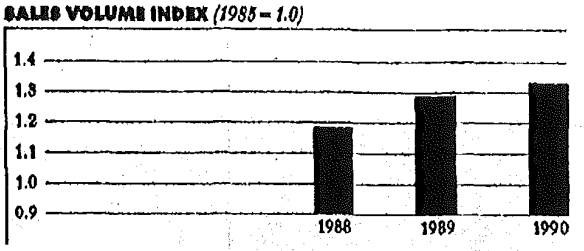
The record profit in 1989, aided by the treasury stock purchase program, improved ROE to 17.6 percent (16.6 percent excluding the analgesics divestiture gain) from 15.4 percent in 1988.

ANALYSIS OF CHANGE IN EARNINGS PER SHARE – BETTER (WORSE)

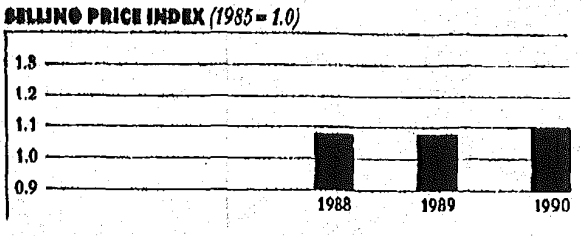
	1990 vs. 1989	1989 vs. 1988
Sales-Related Factors:		
Selling prices	$ 0.72[1]	$ 0.13
Sales volume and mix	0.77	1.97
Total Sales-Related Factors	1.49	2.10
Cost-Related Factors:		
Raw material costs	(0.57)	0.09
Manufacturing capacity utilization	(0.38)	(0.14)
Other manufacturing costs	(0.74)	(0.22)
Marketing, administrative and technological expenses	(0.70)	(1.09)
Total Cost-Related Factors	(2.39)	(1.36)
Divestitures	0.11	(0.20)
Operating Income	(0.79)	0.54
Interest expense	0.02	(0.04)
Interest income	(0.02)	0.05
Other income – net	(0.17)	(0.02)
Change in income taxes	(0.03)	0.08
Change in shares outstanding	0.21	0.26
Change in Earnings per Share	$(0.78)	$ 0.87

[1] *Increase was entirely due to the effect of translating non-U.S. dollar denominated sales into a generally weaker U.S. dollar.*

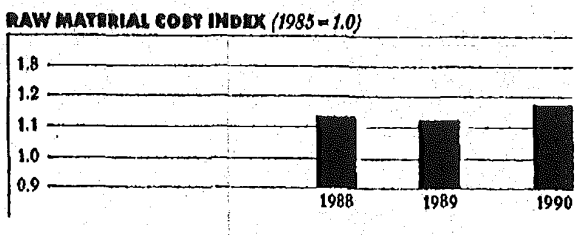
SALES VOLUME INDEX *(1985 = 1.0)*



SELLING PRICE INDEX *(1985 = 1.0)*



RAW MATERIAL COST INDEX *(1985 = 1.0)*



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OPERATING UNIT SEGMENT DATA

	Net Sales			Operating Income (Loss)			Research and Development		
	1990	1989	1988	1990	1989	1988	1990	1989	1988
Agricultural Products	$1,676	$1,717	$1,546	$327	$ 432	$424	$151	$162	$153
Chemicals	4,035	4,065	3,989	297	497	486	115	104	108
Fisher Controls	927	852	840	95	64	29	17	17	19
NutraSweet	933	869	736	183	180	154	41	39	35
Pharmaceuticals	1,424	1,178	978	93	6	(62)	228	218	198
Electronic Materials			209			11			6
Biotechnology Product Discovery				(52)	(47)	(47)	52	47	47
Corporate				(84)	(54)	(40)	8	11	9
Total	$8,995	$8,681	$8,293	$909	$1,078	$955	$612	$598	$575

	Total Assets			Capital Expenditures			Depreciation and Amortization		
	1990	1989	1988	1990	1989	1988	1990	1989	1988
Agricultural Products	$1,668	$1,489	$1,261	$134	$148	$123	$124	$106	$110
Chemicals	3,163	2,993	2,883	340	300	329	260	247	235
Fisher Controls	647	634	682	39	29	25	35	31	37
NutraSweet	1,296	1,344	1,484	113	49	36	218	215	209
Pharmaceuticals	2,085	1,814	1,604	112	71	56	87	79	79
Electronic Materials			217			10			20
Biotechnology Product Discovery	59	54	67	8	6	7	13	10	11
Corporate	318	276	263	4	4	4	2	2	2
Total	$9,236	$8,604	$8,461	$750	$607	$590	$739	$690	$703

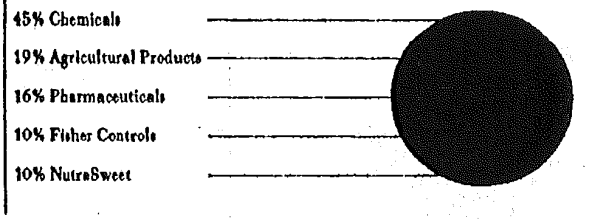
The above data should be read in conjunction with the Segment Information note to the financial statements on page 47.

Although inflation is relatively low in most of Monsanto's major markets, it continues to affect operating results. To mitigate the effect of inflation, Monsanto has implemented measures to manage working capital, control costs, improve productivity and raise selling prices where government regulations and competitive conditions permit. In addition, it is estimated that the current cost of replacing certain assets is greater than their historical cost presented in the financial statements. Accordingly, the depreciation and amortization expenses reported above would be greater if the expenses were stated on a current cost basis.

The 1988 operating results of the Electronic Materials business, which was sold in March 1989, included the 10 months ended October 31, 1988. This business was not reported as a discontinued operation in the Statement of Consolidated Income because the effect was immaterial.

The principal factors that accounted for the operating units' performance in 1990 and 1989, along with the factors that are expected to affect operating results in the near term, are described on the following pages.

1990 NET SALES *(percent by operating unit)*



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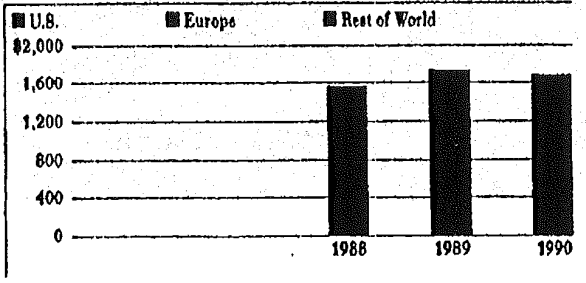
AGRICULTURAL PRODUCTS

	1990	1989	1988
Net Sales:			
Crop chemicals	$1,508	$1,558	$1,377
Animal feed ingredients	168	159	169
Total	$1,676	$1,717	$1,546
Operating Income	827	432	424

The Agricultural Products operating unit is a leading worldwide producer and marketer of herbicides, including *Roundup, Lasso, Far-Go, Avadex* and *Machete* herbicides. More than half of the unit's herbicide net sales are made to markets outside the United States. Weather conditions in the agricultural markets throughout the world affect sales volume. The unit also produces animal nutrition and growth products, which include *Alimet* animal feed supplement and *Santoquin* feed antioxidant.

AGRICULTURAL PRODUCTS NET SALES *(dollars in millions)*



In the fourth quarter of 1990, the Board of Directors approved a restructuring of the Agricultural Products unit. The restructuring included a reorganization of the crop chemicals business along product lines and a decision to sell the animal feed ingredients business. In line with the restructuring and the related organizational changes, results for the crop chemicals and animal sciences subunits have been combined to provide more meaningful reporting of the unit's results.

The costs of the restructuring were $108 million, with the largest component related to a reduction in employment. The sale of the animal feed ingredients business is expected to result in a gain in excess of the restructuring costs. Accordingly, the restructuring costs have been deferred until 1991, when management expects to sell the animal feed ingredients business.

Agricultural Products net sales and operating income in 1990 decreased 2 percent and 24 percent, respectively. Droughts in Europe and in the western United States, extremely wet weather in the southern United States, and a freeze in Florida that damaged the citrus crop combined to limit the growth in sales volume of glyphosate herbicides to a modest increase. Reductions in selling prices on most glyphosate products and new formulations continued to make the herbicide cost-effective for weed control for a broader range of crop, industrial and residential uses. Actual customer usage of glyphosate herbicides grew about 14 percent, as customers reduced their inventories. Operating income in 1990 declined primarily due to the sales volume growth in glyphosate herbicides not compensating for the ongoing strategically planned selling price reductions for those products. In addition, operating income was hurt by low use of expanded plant capacity and higher raw material costs.

Net sales for *Lasso* herbicide decreased 5 percent. Selling prices increased for *Lasso* herbicide, but sales volume declined 13 percent. Sales volume of *Lasso* declined due to a shift in the timing of customer purchases and a slight drop in market share. Net sales of *Avadex* herbicide decreased 17 percent because of adverse weather in North America, a poor farm economy in Canada and poor economic conditions in the Soviet Union. *Alimet* animal feed supplement experienced significant sales volume growth, but competitive pricing pressures reduced average 1990 selling prices. However, average selling prices at December 1990 were higher than those of the prior year-end. Total manufacturing capacity utilization for Agricultural Products fell to 60 percent from 74 percent in 1989.

Biotechnology-produced bovine somatotropin (BST), a naturally occurring protein that has been shown in research studies to enhance the efficiency of milk production in dairy cows, is awaiting approval by the U.S. Food and Drug Administration (FDA). Expenditures for BST and the ongoing research and development costs associated with porcine somatotropin (PST), a feed efficiency and growth rate enhancer that has been shown in research studies to result in leaner pork, continued to adversely affect financial results. Expenditures for BST and PST

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were about the same as in the prior year. The BST-related assets are significant.

In 1989, net sales increased 11 percent, and operating income improved 2 percent. Sales volume of *Roundup* and other glyphosate herbicides was up 25 percent despite dry weather in northern Europe. Selling price reductions for glyphosate products stimulated demand, resulting in the expansion of existing markets and the entrance into new markets. Sales volume for *Lasso* herbicide was strong because of increased plantings of corn and soybeans in the United States. Sales volume of *Alimet* animal feed supplement grew substantially in 1989, but net sales and earnings declined because of lower selling prices. Expenditures for BST and PST were higher in 1989 than in 1988.

OUTLOOK – AGRICULTURAL PRODUCTS

Market research indicates that the slowdown in the 1990 sales growth of *Roundup* herbicide was essentially a weather-related problem that will improve when weather conditions return to normal. *Roundup* herbicide will continue to be a major product for many years to come. The remaining patents protecting glyphosate herbicide expire in 1991 (in the United States and certain other countries) and 2000 (in the United States).

Agricultural Products has a significant number of new products in the research and development pipeline and some that are currently in the initial stages of commercialization. The focus continues to be on a number of traditional, as well as biotechnology-related, products. Products in the pipeline or in the initial stages of commercialization include *Dimension* herbicide for the effective control of crabgrass, which is now awaiting registration by the U.S. Environmental Protection Agency (EPA), and *Expedite* lawn care products, launched in late 1989, which consist of containers of premixed herbicides along with lightweight backpacks and sprayer lances.

BST has been approved in seven countries. However, it has not yet been approved in the United States. BST will have significant value to the dairy industry through the reduction of milk production costs, but it continues to meet opposition from vocal factions that resist any products using biotechnology. Monsanto is preparing to commercialize BST immediately after its approval by regulatory bodies. The cost to maintain that state of readiness will continue in 1991.

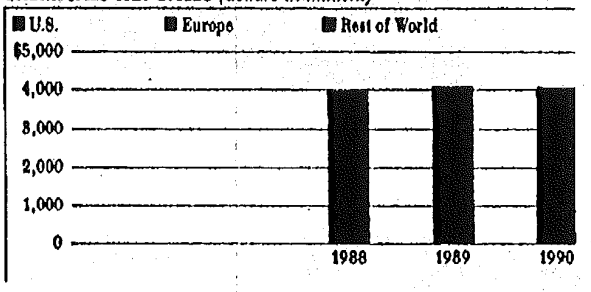
The animal feed ingredients business, comprised of *Alimet* animal feed supplement and *Santoquin* feed antioxidant, is expected to be sold in 1991.

CHEMICALS

	1990	1989	1988
Net Sales:			
Detergents and phosphates	$ 509	$ 492	$ 465
Engineered products	137	134	109
Man-made fibers	971	986	962
Plastics	850	855	887
Resin products	527	512	509
Rubber and process chemicals	634	627	588
Specialties	407	459	469
Total	$4,035	$4,065	$3,989
Operating Income	297	497	486

The Chemicals operating unit produces a wide range of chemicals, plastics, fibers and other products listed in the table above. The unit's principal strengths are nylon carpet fiber, high-performance plastics, *Saflex* plastic interlayer, detergent ingredients, phosphates, rubber chemicals and maleic anhydride.

CHEMICALS NET SALES *(dollars in millions)*



Chemicals net sales were essentially level with those of the prior year, but operating income in 1990 was down 40 percent from 1989's record performance. Net sales were adversely affected by the soft automotive and commercial construction sectors of the North American economy. Chemicals net sales in Europe and Asia-Pacific remained strong. The effect of translating non-U.S. dollar denominated sales into a generally weaker U.S. dollar increased net sales $100 million.

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Operating income in 1990 was hurt by rapid escalation in the cost of petrochemical-based raw materials during the latter part of 1990, which occurred because the crisis in the Middle East caused the rapid escalation of world oil prices. To a lesser extent, operating income was hurt by lower sales demand for plastics and resins used in the North American automotive industry; and plastics, resins and fibers used in the construction industry. Average raw material costs increased about 6 percent during 1990. Selling prices were increased in late 1990, but those increases did not take effect quickly enough to counter the effect of higher petrochemical-based raw material costs. Late in 1990, some raw material costs showed signs of improving; however, the overall situation was still highly volatile. The lower customer demand resulted in reduced manufacturing capacity utilization. Capacity utilization, an important factor for Chemicals profitability, was 78 percent in 1990, versus 82 percent in 1989. Operating profit margin declined to 7 percent, versus 12 percent in 1989.

Detergents and phosphates net sales improved in 1990. Detergent ingredient product sales grew, but reduced Brazilian demand resulted in lower phosphate sales.

Man-made fibers net sales in 1990 were slightly below those of 1989 because of moderate weakness in industry pricing, primarily as a result of softness in final consumer demand. Operating income was adversely affected by the escalating cost of petrochemical-based raw materials during the latter part of 1990. Nylon carpet staple sales volume was higher than that of the prior year due to the successful introduction of a new patented product, *Traffic Control Fiber System*, which is specifically engineered to prevent matting.

Plastics suffered from lower sales demand by the North American automotive and construction markets. However, plastics net sales remained strong in Europe. In addition, plastics profitability was hurt by higher-priced raw materials.

Sales volume of *Saflex* plastic interlayer followed the downward North American economic trend in both the automotive and commercial construction industries, but this effect was substantially recouped by performance in other markets. Market and technology programs that focused on the architectural and automotive businesses have helped sustain market share.

Rubber chemicals sales volume followed the same downward trend as many of Chemicals other businesses. Maleic anhydride sales growth continued. In addition to the effect of high raw material costs experienced by rubber and process chemicals during the latter part of 1990, temporary manufacturing difficulties also increased costs.

Specialties net sales declined in 1990 as a result of the 1989 divestiture of the analgesics business, which had 1989 net sales of $70 million. Competitive pricing pressures, along with temporary manufacturing problems, suppressed operating income.

In 1989, net sales in the Chemicals business increased 2 percent over 1988. Sales volume and selling prices were strong for most businesses, although demand in the North American automotive markets slowed somewhat late in the year. Most raw material costs peaked in the first quarter, then generally decreased throughout the remainder of 1989. On average, raw material costs for the full year 1989 were slightly lower than those of 1988. Operating income grew by 2 percent over 1988, but with slightly lower capacity utilization. The operating profit margin was unchanged at 12 percent of net sales.

OUTLOOK – CHEMICALS

The Chemicals operating outlook for 1991 is difficult to predict. Maintaining market share in a soft U.S. economy will be a difficult challenge. However, the very high raw material costs experienced in the latter part of 1990 have declined in early 1991. Improvement of manufacturing performance and prudent management of environmental activities are also major challenges that will affect operating income for 1991.

In December 1990, the thermoplastic elastomer business (with 1990 net sales of $96 million) was merged with Exxon Chemical Company's elastomer concentrates business in a joint venture named Advanced Elastomer Systems, L.P. Monsanto's share of this joint venture's future income will be reported in "Other income – net" in the Statement of Consolidated Income and excluded from Chemicals operating income.

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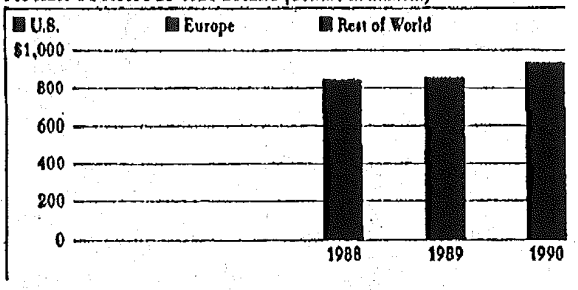
FISHER CONTROLS

	1990	1989	1988
Net Sales:			
Final control systems	$490	$436	$404
Instrumentation	222	208	196
Other	215	208	240
Total	$927	$852	$840
Operating Income	95	64	29

Fisher Controls is a leading worldwide producer of process control equipment, which includes industrial valves and regulators, *PROVOX* electronic process instrumentation, *Permea* gas separation systems, and service and repair operations.

FISHER CONTROLS NET SALES *(dollars in millions)*



Fisher Controls recorded a strong performance in 1990. Operating income rose 48 percent on net sales growth of 9 percent. Selling price improvements, strong customer demand in the process industries and improved production turnaround of booked orders contributed to this growth. Final control systems net sales were up 12 percent, and instrumentation net sales were up 7 percent compared with those of 1989. New products launched in 1990 included Titan, a major enhancement to *PROVOX* distributed control system, and the R/S400 regulator. In addition, Fisher Controls service and repair business continued to expand during 1990.

In 1989, operating income more than doubled from the previous year. Principal factors were strong selling prices and higher demand, especially for final control systems and *PROVOX* electronic process instrumentation. The effect of these gains was reduced somewhat by higher raw material costs. Comparisons with 1988 are affected by net sales of $96 million and an operating loss of $6 million in 1988 for businesses subsequently divested. Excluding divestitures, net sales grew 14 percent in 1989 on continuing operations, with significant strength in the chemical, pulp and paper markets.

OUTLOOK – FISHER CONTROLS

Fisher Controls business is dependent primarily upon worldwide capital expenditures in the chemical, oil and gas, power and the pulp and paper industries. The crisis in the Middle East is expected eventually to stimulate demand in the oil and gas industry, while depressing demand in the chemical industry. The outlook for overall demand is affected by the events in the Middle East and the fact that, historically, Fisher Controls performance has lagged the capital spending in its customers' markets by six to nine months. In addition, sophisticated control systems require significant lead time for manufacture and installation. As a result, booked orders in backlog is a key indicator for the next year's business performance. These orders remained strong in final control systems, regulators and process instrumentation at the end of 1990.

NUTRASWEET

	1990	1989	1988
Net Sales	$933	$869	$736
Operating Income	183	180	154

The NutraSweet Company manufactures and markets *NutraSweet* brand sweetener, which is sold worldwide, and *Equal* low-calorie table-top sweetener, which is sold in the United States. *Simplesse* all natural fat substitute was introduced in the United States in 1990. Sales of *NutraSweet* brand sweetener in the rapidly growing European market are made by a 50 percent-owned European joint venture and therefore are not included in NutraSweet net sales and operating income. NutraSweet's share of the European joint venture's financial results are reflected in "Other income – net" in the Statement of Consolidated Income.

NutraSweet continued its strong performance in 1990. Net sales were up 7 percent and operating income grew

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2 percent. Over 90 percent of net sales were in the U.S. market. The higher operating income from a sales volume increase of 11 percent for *NutraSweet* brand sweetener was mostly negated by 6 percent lower worldwide average selling prices and launch costs associated with *Simplesse* all natural fat substitute and *Simple Pleasures* frozen dairy dessert. The volume increase for *NutraSweet* brand sweetener was led by strong demand from diet carbonated soft drink markets. Sales of *Simplesse,* consisting primarily of *Simple Pleasures,* were affected by the delayed introduction and heavy competition in the fat-free market.

In 1989, NutraSweet net sales were up 18 percent over 1988 and operating income was up 17 percent. The year-to-year increase in operating income resulted from a 20 percent increase in volume led by strong demand from diet carbonated soft drink markets for *NutraSweet* brand sweetener and continued decreases in production costs. These factors were somewhat negated by lower worldwide average selling prices for *NutraSweet* brand sweetener and higher marketing expenses, which were partially attributable to prelaunch costs for *Simplesse* all natural fat substitute.

OUTLOOK – NUTRASWEET

Demand for lower-calorie products worldwide is projected to increase. This projection presents growth opportunities for *NutraSweet* brand sweetener. While the United States will remain the principal market for *NutraSweet* brand sweetener in 1991, efforts to develop international markets will continue. Projects to expand production capacity are under way.

NutraSweet's aspartame use patents have already expired in most countries and will expire in the United States in December 1992. Competition from generic aspartame and other sweeteners likely will lower selling prices in the United States over time. However, consumer trends and brand-name recognition bode well for the future growth of low-calorie products containing *NutraSweet* brand sweetener.

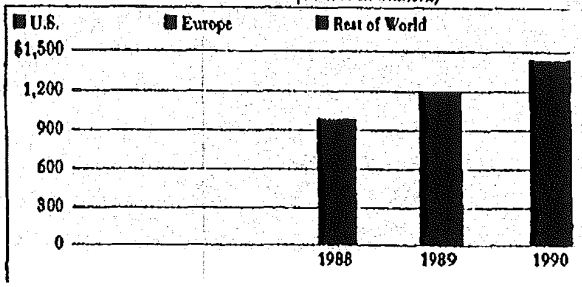
Launches of additional products containing *Simplesse* all natural fat substitute are expected in the United States and Europe in 1991. The "generally recognized as safe" (GRAS) status of *Simplesse* in frozen dairy desserts was affirmed by the FDA in early 1990. An additional petition requesting the FDA to affirm the GRAS status of *Simplesse* in additional categories was filed in 1990, and affirmation is expected in 1991. The use of *Simplesse* all natural fat substitute is already permitted by regulatory authorities in many countries, including the United Kingdom, Germany, France and Japan.

PHARMACEUTICALS

	1990	1989	1988
Net Sales	$1,424	$1,178	$973
Operating Income (Loss)	93	6	(62)

Searle is a research-based, worldwide pharmaceutical business concentrating on drugs for the treatment of cardiovascular, gastrointestinal, immuno-inflammatory, central nervous system and infectious diseases.

PHARMACEUTICALS NET SALES *(dollars in millions)*



Pharmaceuticals continued to make dramatic gains in operating results in 1990, bolstered by continued sales growth, especially for the family of *Calan* calcium channel blockers for hypertension and *Cytotec* ulcer preventive drug. Pharmaceuticals net sales were up 21 percent in 1990. Sales volume improved about 15 percent. Net sales for *Calan* calcium channel blockers for hypertension, sold in the North American market, reached new records in 1990. Net sales for *Calan* increased 28 percent, to $467 million, reflecting strong demand for the newly introduced 180-milligram dose. Worldwide sales for *Cytotec* ulcer preventive drug were $91 million, up 52 percent from 1989. *Kerlone,* a new beta blocker for the treatment of high blood pressure, was launched in the United States. In addition, net sales in 1990 included full-year results for a German pharmaceuticals company acquired in October

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1989. This acquisition increased year-to-year Pharmaceuticals net sales $58 million in 1990. Searle sells a low-calorie table-top sweetener outside the United States, primarily under the name *Canderel.* Sales in 1990 outside the United States of this product (which is marketed by NutraSweet in the United States under the brand name *Equal*) were $132 million, up 18 percent from 1989.

Pharmaceuticals operating income reached $93 million in 1990, compared with $6 million in 1989, driven principally by the increased sales level. The 1990 sale of non-strategic product lines in Italy and France contributed to the gain in operating income. Costs were incurred for the launch of *Kerlone* and other product development activities.

Pharmaceuticals continues to invest significantly in research and development (R&D). Pharmaceuticals R&D expenditures were 16 percent of the unit's net sales in 1990. This spending level demonstrates the commitment to product discovery and development that is aimed at securing sound long-term financial performance for Pharmaceuticals.

In 1989, Pharmaceuticals exceeded $1 billion in net sales and recorded its first year of operating profitability since the acquisition of Searle in 1985. Net sales grew 21 percent, driven by an approximate 50 percent increase in net sales for the family of *Calan* calcium channel blockers for hypertension, significant growth for *Cytotec* ulcer preventive drug and a 32 percent growth in net sales of *Canderel* low-calorie table-top sweetener outside the United States. As with most new pharmaceutical product launches, the cost of initial medical education and technological programs associated with the *Cytotec* launch were more than the profit contribution from early sales growth of *Cytotec.* Sales volume increases were achieved in all major geographic markets. Net sales in 1989 included full-year results for the Italian pharmaceuticals company formed in September 1988 and the results from October 1989 of an acquired pharmaceuticals company in Germany.

OUTLOOK – PHARMACEUTICALS

Calan participates in an increasingly competitive market for antihypertensive drugs characterized by frequent new product introductions and the potential for generic competition. Total prescriptions for *Kerlone* beta blocker for the treatment of hypertension are expected to grow in the United States. In 1991, Searle expects to launch *Maxaquin,* the first once-a-day anti-infective drug in the quinolone class, in several countries outside the United States.

Other new products are expected to emerge in 1991 from Searle's developmental pipeline, including a new product for the treatment of arthritis called *Arthrotec,* a combination of Searle's *Cytotec* ulcer preventive drug and diclofenac, the world's best-selling arthritis medication. Zolpidem, the first of a new class of sleeping aids, is now pending approval at the FDA and may be launched in the United States as early as 1991.

Products currently in various stages of scientific development include products to treat abnormal heart rhythms, pain, anxiety disorders, Alzheimer's disease, hypertension, inflammatory diseases such as arthritis, asthma and ulcerative colitis, thrombosis, acquired immune deficiency syndrome (AIDS) and other viral diseases. A collaborative discovery program with Washington University in St. Louis continues, encompassing almost 40 research projects. The collaboration with Oxford University in the United Kingdom is pursuing a newly emerging technology related to the role of body sugars in biological processes. This technology could help to unlock the mechanisms of many diseases.

Improved participation in the Japanese pharmaceuticals market continues to be an important focus for Searle. Toward that end, Searle increased its ownership interest in its Japanese subsidiary in 1990.

BIOTECHNOLOGY PRODUCT DISCOVERY

The mission of Biotechnology Product Discovery is to generate a continuous pipeline of proprietary product opportunities and new technologies essential to success in the areas of human health, plant-related agriculture and chemical products. For human health care, Monsanto applies biotechnology to provide target proteins for the development of novel pharmaceutical chemicals. The strategy for plant-related agriculture is to generate proteins, the products of which are expressed in genetically transformed plants providing unique agronomic characteristics. The chemical research programs provide novel high-performance chemicals and unique approaches to manufacturing processes and waste minimization. When product leads and new technologies are refined and clarified, they are transferred to the operating units for further development and commercialization.

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GEOGRAPHIC DATA

	Net Sales to Unaffiliated Customers			Operating Income (Loss)			Total Assets		
	1990	1989	1988	1990	1989	1988	1990	1989	1988
United States	$5,685	$5,590	$5,219	$639	$ 721	$638	$6,348	$6,169	$6,240
Europe-Africa	1,995	1,800	1,801	235	282	245	2,061	1,657	1,447
Asia-Pacific	561	546	592	42	60	74	495	388	478
Canada	413	430	377	32	50	37	169	150	149
Latin America	341	315	304	17	23	27	271	254	242
Inter-area Eliminations				(22)	(4)	(26)	(426)	(290)	(358)
Corporate				(34)	(54)	(40)	318	276	263
Total	$8,995	$8,681	$8,293	$909	$1,078	$955	$9,236	$8,604	$8,461

The data above are prepared on an "entity basis," which means that net sales, operating income and assets of a legal entity are assigned to the geographic area where the legal entity is located (for example, a sale from the United States to Latin America is reported as a U.S. sale). Inter-area sales between Monsanto entities have been excluded from the above table; they are shown in the Segment Information note to the financial statements on page 47. The reported operating income for the individual geographic areas does not include the full profitability generated by sales of Monsanto products imported from other locations, principally from the United States.

Sales and operating income for the geographic segments does not include the financial results from those joint venture companies in which Monsanto does not have management control, the largest of which are in Latin America and Asia-Pacific. Monsanto's share of the income or loss of these companies is reflected in "Other income – net" in the Statement of Consolidated Income (a loss of $1 million for Latin America and income of $3 million for Asia-Pacific in 1990). Monsanto's share of these unconsolidated net sales in 1990 was $219 million for Latin America and $187 million for Asia-Pacific.

UNITED STATES RESULTS WERE MIXED

Net sales by entities in the United States were 2 percent higher in 1990 versus those of the prior year. Sales volumes grew for Pharmaceuticals, NutraSweet and Fisher Controls, and selling prices were higher in certain product lines. Sales volumes declined for Chemicals. Agricultural Products net sales were essentially level with the prior year's. Direct export sales from the United States to non-U.S. third party customers were $491 million, $467 million and $502 million for 1990-1988, respectively.

Monsanto's U.S. operating income declined 11 percent, primarily due to higher Chemicals raw material costs, lower Chemicals sales volumes and lower manufacturing capacity utilization.

Net sales by entities in the United States increased 7 percent in 1989 on the strength of sales volume growth of herbicides, *NutraSweet* brand sweetener, *Calan* antihypertensive drugs and *Cytotec* ulcer preventive drug. Chemicals and Fisher Controls products also had a solid year in net sales and operating income in 1989.

EUROPE-AFRICA PROFIT AFFECTED BY DROUGHT

Operating income for 1990 was 17 percent below the record level of 1989, primarily due to lower sales volume for glyphosate and *Avadex* herbicides and lower selling prices for glyphosate herbicides. Operating income was helped by higher sales of Pharmaceuticals and Fisher Controls products. Chemicals performance was in line with the record of 1989.

Net sales in 1990 were 11 percent ahead of 1989's due to the $202 million effect of translating non-U.S. dollar denominated sales into a weaker U.S. dollar and the full-year sales results of the German pharmaceuticals company acquired in October 1989. This acquisition increased

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year-to-year net sales $58 million in 1990. Net sales also increased for Fisher Controls, Pharmaceuticals and *Saflex* plastic interlayer. Drought in western Europe had a severe impact on glyphosate herbicide applications. In addition, poor economic conditions in the Soviet Union resulted in reduced herbicide shipments to that country. Glyphosate herbicide net sales were also affected by reductions in average selling prices.

Net sales in 1989 were level with those of 1988, principally because of divestitures, which had 1988 net sales of $138 million. Higher sales volumes were recorded for glyphosate herbicides, rubber chemicals, *Saflex* plastic interlayer, and *Canderel* low-calorie table-top sweetener, while Fisher Controls sales increased for continuing businesses. In addition, 1989 net sales included the full-year sales of the Italian company formed in late 1988. Operating income for 1989 was a record despite higher BST costs.

ASIA-PACIFIC BUSINESS EXPANDED

In 1990, Asia-Pacific net sales increased 3 percent, but operating income declined 30 percent. The decline in Asian entities 1990 operating income was principally due to unfavorable sales product mix. Net sales in 1990 increased $31 million as a result of the acquisition of certain chemical businesses of a Monsanto joint venture in Japan. Net sales from this acquisition more than compensated for the loss of net sales in this area from the analgesics business, which was divested in 1989. Despite poor weather and a deteriorating farm economy in Australia, sales volume for glyphosate herbicides in Asia-Pacific was about the same as that of the prior year. However, herbicides suffered from lower selling prices and a customer shift toward purchases of lower-margin glyphosate herbicides. Net sales of Pharmaceuticals and Fisher Controls products were about the same as in the prior year.

In 1989, net sales and operating income in Asia-Pacific declined 8 percent and 19 percent, respectively, due to the earnings lost when certain nonstrategic businesses were divested. Glyphosate herbicide sales increased 22 percent due to rapid volume growth in several countries, particularly in Australia. Fisher Controls net sales grew 19 percent. On a continuing product basis, Chemicals net sales were up 15 percent across a diverse group of products.

CANADA RESULTS SUFFER DUE TO WEATHER AND ECONOMIC CONDITIONS

Net sales in Canada were down 4 percent in 1990, while operating income declined 36 percent. Weaker markets for housing and automobiles lowered Chemicals results, while unfavorable weather conditions and lower net farm income levels hurt Agricultural Products results. Customers' new capital investment in Canada declined, slowing the growth of Fisher Controls products, but strength in export markets negated this decline. Pharmaceuticals achieved significant sales increases for *Isoptin* SR calcium channel blocker (sold as *Calan* SR in the United States) and *Cytotec* ulcer preventive drug.

Net sales and operating income increased 14 percent and 35 percent, respectively, in 1989. Strong overall demand, broader applications for glyphosate herbicides and increases in planted acreage for cereal grain produced higher net sales and operating income for Agricultural Products. Strong capital investment and exports from Canada contributed to growth in sales volume for Fisher Controls. Chemicals net sales and operating income were stable. Pharmaceuticals also experienced sales growth for *Cytotec* and *Isoptin*.

LATIN AMERICA HURT BY RECESSIONARY ENVIRONMENT

Net sales by Latin American entities increased 8 percent, while operating income declined $6 million. The decline in operating income was principally due to lower profit on export sales. Net sales of agricultural products increased 10 percent in 1990. Chemicals net sales and operating income improved, despite lower sales volume due to the recessionary business environments in Brazil and Argentina, as the new governments moved to open their economies and drastically reduce inflation.

In 1989, net sales increased $11 million compared with those of 1988, while operating income declined $4 million. Net sales and operating income for herbicides grew in 1989, but profitability for Chemicals and Pharmaceuticals declined. Government-controlled selling price increases were not adequate to compensate for the effect of high inflation rates on costs throughout Latin America.

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STATEMENT OF CONSOLIDATED FINANCIAL POSITION

(Dollars in millions, except per share)	At December 31,	
Assets	**1990**	**1989**
Current Assets:		
Cash, time deposits and certificates of deposit	$ 183	$ 198
Short-term securities, at cost which approximates market	21	55
Trade receivables, net of allowances of $35 in 1990 and $23 in 1989	1,498	1,309
Miscellaneous receivables and prepaid expenses	370	295
Deferred income tax benefit	171	194
Inventories	1,270	1,197
Total Current Assets	3,513	3,248
Intangible Assets, net of accumulated amortization of $1,259 in 1990 and $1,029 in 1989	1,425	1,682
Investments in Affiliates	248	204
Other Assets	558	297
Property, Plant and Equipment:		
Land	112	105
Buildings	1,254	1,100
Machinery and equipment	5,779	5,370
Construction-in-progress	475	362
Total property, plant and equipment	7,620	6,937
Less accumulated depreciation	4,128	3,764
Net Property, Plant and Equipment	3,492	3,173
Total Assets	$9,236	$8,604
Liabilities and Shareowners' Equity		
Current Liabilities:		
Accounts payable	$ 584	$ 514
Wages	237	223
Income and other taxes	95	126
Miscellaneous accruals	692	554
Short-term debt	582	505
Total Current Liabilities	2,190	1,922
Long-Term Debt	1,652	1,471
Deferred Income Taxes	640	621
Other Liabilities	665	649
Shareowners' Equity:		
Common stock – authorized, 200,000,000 shares, par value $2; issued, 164,394,194 shares in 1990 and 82,197,097 shares in 1989	329	164
Additional contributed capital	714	877
Accumulated currency adjustment	188	24
Reinvested earnings	4,421	4,120
Treasury stock, at cost (38,616,140 shares in 1990 and 16,050,656 shares in 1989)	(1,563)	(1,244)
Total Shareowners' Equity	4,089	3,941
Total Liabilities and Shareowners' Equity	$9,236	$8,604

The above statement should be read in conjunction with pages 42 through 47 of this report.

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MONSANTO MAINTAINS STRONG FINANCIAL POSITION

Monsanto's financial position remained strong in 1990, as evidenced by Monsanto's current "A" or better debt rating. Financial resources were adequate to support existing businesses and to fund new business opportunities.

Working capital at year-end 1990 was at the same level as that of the prior year-end. Receivables increased primarily as a result of higher fourth quarter 1990 sales versus the prior year's fourth quarter sales. The increase in current liabilities principally related to the Agricultural Products restructuring and increased short-term debt.

Intangible assets continued to decline in 1990, due principally to amortization of the NutraSweet aspartame patent, which had a recorded value of $346 million at year-end 1990. Net property, plant and equipment increased in 1990, as $750 million of capital additions exceeded depreciation. In addition, net property, plant and equipment increased $90 million from the effect of non-U.S. dollar currency translation. The increase in other assets in 1990 resulted primarily from the deferred costs of the Agricultural Products restructuring and higher miscellaneous long-term investments.

As mentioned in the notes to financial statements on pages 44 and 45, Monsanto has not yet adopted Statement of Financial Accounting Standards (SFAS) No. 96, the new income tax accounting standard, which must be adopted in or before 1992, or SFAS No.106, the accounting standard for postretirement benefits other than pensions, which must be adopted in or before 1993.

Total short- and long-term debt at year-end 1990 was $258 million higher than that of the prior year-end. The additional long-term debt was used principally for capacity expansions. To maintain adequate financial flexibility and access to debt markets worldwide, Monsanto management intends to maintain an "A" debt rating. Important factors in establishing that rating are the ratio of total debt to total capitalization, which was 35 percent, and the interest coverage ratio, which was 4.8 in 1990.

Monsanto uses financial markets around the world for its financing needs and has available various short- and medium-term bank credit facilities, which are discussed in the notes to financial statements (page 44). These credit facilities provide the financing flexibility to take advantage of investment opportunities that may arise and to satisfy future funding requirements.

Monsanto's commitments and contingencies are described in the notes to financial statements on page 47.

Monsanto continually evaluates risk retention and insurance levels for product liability, property damage and other potential areas of risk. Monsanto devotes significant effort to maintaining and improving safety and internal control programs, which reduce its exposure to certain risks. Based on the cost and availability of insurance and the likelihood of a loss, management decides the amount of insurance coverage to purchase from unaffiliated companies and the appropriate amount of risk to retain. Since 1985, Monsanto's liability insurance has been on the "claims made" policy form. Management believes that the current levels of risk retention are appropriate and are consistent with those of other companies in the various industries in which Monsanto operates. Monsanto's liquidity, financial position and profitability are not expected to be affected materially by the current levels of risk retention.

Monsanto's principal financial target is a sustained return on shareowners' equity (ROE) of 20 percent or greater. The ROE and other key financial statistics are presented in the table below.

COMMON STOCK SPLIT TWO-FOR-ONE

During 1990, Monsanto split its common stock two-for-one through a stock dividend. This stock split resulted in $165 million of additional contributed capital being reclassified in 1990 to common stock in the Statement of Consolidated Financial Position.

KEY FINANCIAL STATISTICS	1990	1989	1988
Return on Equity (ROE) (Net income divided by average shareowners' equity)	13.6%	17.6%	15.4%
Working Capital (Current assets less current liabilities)	$1,823	$1,326	$1,117
Current Ratio (Current assets divided by current liabilities)	1.6	1.7	1.6
Trade Receivables-Days Sales Outstanding (Fourth quarter trade receivables divided by fourth quarter net sales times 90 days)	63	61	61
Inventory Turnover Ratio (Cost of goods sold divided by inventory)	4.2	4.2	4.2
Interest Coverage (Income before interest expense and income taxes divided by total interest cost)	4.8	5.9	5.5
Cash Provided by Operations/Total Debt	49%	52%	66%
Total Debt/Total Capitalization*	35%	33%	34%

**Total capitalization is the sum of short-term debt, long-term debt and shareowners' equity.*

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STATEMENT OF CONSOLIDATED CASH FLOW

(Dollars in millions)	1990	1989	1988
Increase (Decrease) in Cash and Cash Equivalents			
Operating Activities:			
Net income	$ 546	$ 679	$ 591
Add income tax expense	263	336	302
Income before income taxes	809	1,015	893
Adjustments to reconcile to Cash Provided by Operations:			
Income tax payments	(244)	(294)	(235)
Items that did not use cash:			
Depreciation and amortization	739	690	703
Other	2	26	21
Working capital changes that provided (used) cash:			
Accounts receivable	(189)	(131)	(46)
Inventories	(75)	(90)	(136)
Accounts payable and accrued liabilities	142	(48)	86
Other	54	(17)	67
Nonoperating pre-tax gains from asset disposals and other items	(134)	(114)	(49)
Cash Provided by Operations	1,104	1,037	1,304
Investing Activities:			
Property, plant and equipment purchases	(750)	(607)	(590)
Acquisition and investment payments	(201)	(211)	(100)
Investment and property disposal proceeds	100	307	121
Cash Used in Investing Activities	(851)	(511)	(569)
Financing Activities:			
Net change in short-term financing	77	(50)	53
Long-term debt proceeds	523	261	21
Long-term debt reductions	(351)	(196)	(167)
Treasury stock purchases	(326)	(335)	(457)
Dividend payments	(242)	(221)	(211)
Other financing activities	17	47	24
Cash Used in Financing Activities	(302)	(494)	(737)
Increase (Decrease) in Cash and Cash Equivalents	(49)	32	(2)
Cash and Cash Equivalents*:			
Beginning of year	253	221	223
End of year	$ 204	$ 253	$ 221

The above statement should be read in conjunction with pages 42 through 47 of this report.
The effect of exchange rate changes on cash and cash equivalents was not material.
Cash payments for interest (net of amounts capitalized) were $166 million, $171 million and $167 million, for the years 1990-1988, respectively.
**Includes cash, time deposits, certificates of deposit and short-term securities.*

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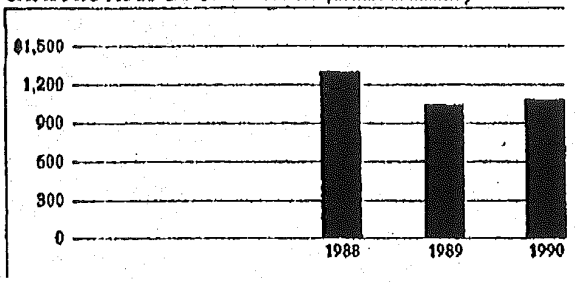
CASH FLOW REMAINED STRONG

Monsanto's cash flow for the three-year period of 1990-1988 is shown in the Statement of Consolidated Cash Flow on the preceding page.

CASH PROVIDED BY OPERATIONS *(dollars in millions)*



Cash provided by operations was strong, totaling $1,104 million. Cash from operations in 1990 was generated principally by Chemicals, with Agricultural Products and NutraSweet also contributing significantly. Monsanto's operations have generated sufficient cash to fund existing businesses, growth-related research and investments. Management expects cash provided by operations, supplemented by periodic borrowings, to be adequate to fund future requirements.

Investment and property disposals in 1990 generated $100 million of cash. The principal proceeds in 1990 were related to the sale of certain assets of a joint venture in Japan; in 1989, to the divestiture of the Electronic Materials and the analgesics businesses; and in 1988, to the sale of the Australian commodity chemicals and plastics businesses.

Major uses of cash for the three-year period included capital expenditures, treasury stock purchases and dividends. The acquisition of a German pharmaceuticals company in 1989 and the formation of an Italian pharmaceuticals company in 1988 were also major uses of cash. Monsanto's 1990 capital expenditures focused on improved technology, capacity expansions, and environmental projects and totaled $750 million. The largest project was the expansion of production capacity for the NutraSweet business.

Long-term debt proceeds in 1990 included $193 million of commercial paper to be refinanced on a long-term basis; $132 million in 80-year variable-rate industrial development bonds; and $156 million from the issuance of medium-term notes. In 1989, long-term debt proceeds included $99 million in 20-year 8⅞ percent debentures and $50 million from the issuance of medium-term notes.

COMMITMENT TO ENVIRONMENT CONTINUES

Monsanto is subject to various laws and governmental regulations concerning environmental matters, product safety and employee health. Monsanto anticipates that increasingly stringent requirements will be imposed upon Monsanto and industry in general. Monsanto is dedicated to a long-term environmental protection program that reduces emissions of hazardous materials into the environment, as well as to the remediation of identified existing environmental concerns. In 1988, management committed to a 90 percent reduction in toxic air emissions by the end of 1992, a goal that will require the development and installation of new technology and additional capital expenditures. Reduction of 39 percent was accomplished through 1989. Compilation of data for 1990 is not complete; however, further reduction has been achieved. The cost to accomplish this target is not expected to materially affect operating results in any given year. Some of these projects will lower operating costs and improve operating efficiency.

Expenditures in 1990 were approximately $85 million for environmental capital projects and approximately $265 million for operation and maintenance of environmental protection facilities. Monsanto estimates that during 1991 and 1992 approximately $85-100 million per year will be spent on additional capital projects for environmental protection.

Monsanto has received notices from the Environmental Protection Agency that it is a potentially responsible party (PRP) at 74 Superfund sites. Monsanto's future remediation expenses are not expected to have a material effect on future operating results because of (1) the low percentage of material attributable to Monsanto at most sites relative to that attributable to other parties, (2) the strong financial capabilities of the other PRPs at most sites, and (3) the accrued liability discussed below.

Monsanto spent $27 million in 1990 for remediation of waste disposal sites. Most of these expenditures relate to the Chemicals unit, and similar or greater amounts can be expected in future years. Monsanto's policy is to accrue these costs in the accounting period in which the responsibility is established and the cost is estimable. At December 31, 1990, Monsanto's balance sheet included an accrued liability of approximately $120 million for the remediation of waste disposal sites. Monsanto's liquidity, financial position and profitability are not expected to be affected materially by the cleanup costs for Superfund and other waste disposal sites.

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COMMON STOCK PURCHASE PROGRAM CONTINUES

In December 1989, the Board of Directors authorized the purchase of 10 million shares of Monsanto common stock. By year-end 1990, Monsanto had purchased 6.7 million shares at a cost of $326 million. Since June 1987, Monsanto has purchased 32.7 million shares at a cost of $1,457 million. Management believes the stock purchase program represents a sound economic investment for Monsanto's shareowners. Stock purchases favorably affect earnings per share and aid in the achievement of management's 20 percent return on equity target.

DIVIDENDS INCREASE FOR THE 18TH CONSECUTIVE YEAR

Monsanto has paid dividends on its common shares without interruption or reduction since 1928, and has increased the dividend per share in each of the past 18 years. Dividend payout for 1990 was 22 percent of cash provided by operations and 44 percent of net income. Monsanto's dividend policy reflects a desired long-term payout percentage based on Monsanto's expectations of future growth and profitability levels. In any individual year, additional consideration is given to expected financial position and results, working and fixed capital needs, scheduled debt repayments and economic conditions, including inflation.

Monsanto's common stock is traded principally on the New York Stock Exchange and is listed on the exchanges in Tokyo and seven European cities. The number of shareowners of record as of February 22, 1991, was 61,999, and the high and low common stock prices on that date were $57⅝ and $56½.

QUARTERLY DATA

		First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total Year
Net Sales	1990	$2,286	$2,367	$2,140	$2,202	$8,995
	1989	2,265	2,348	2,061	2,007	8,681
Gross Profit	1990	987	1,060	801	781	3,629
	1989	979	1,051	845	771	3,646
Operating Income	1990	327	371	142	69	909
	1989	364	397	216	101	1,078
Net Income	1990	194	247	74	31	546
	1989	222	241	126	90	679
Earnings per Share	1990	1.47	1.90	0.59	0.27	4.23
	1989	1.62	1.77	0.94	0.68	5.01
Dividends per Share	1990	0.425	0.485	0.485	0.485	1.88
	1989	0.375	0.425	0.425	0.425	1.65
Common Stock Price						
1990	High	60⅛	55¼	52	49⅛	60⅛
	Low	51¼	46⅛	38¾	39⅝	38¾
1989	High	47⅞	55½	62⅛	61	62⅛
	Low	40¼	47	52½	54⅛	40¼

Monsanto's net income is historically higher during the first half of the year attributable primarily to a concentration of the generally more profitable Agricultural Products sales in the first half of the year.

Second quarter 1990 net income includes a gain of $31 million resulting from the divestiture of certain assets of a joint venture in Japan. Fourth quarter net income includes gains from divestitures totaling $20 million in 1990 and a gain of $36 million in 1989 from the sale of the analgesics business.

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STATEMENT OF CONSOLIDATED SHAREOWNERS' EQUITY

(Dollars in millions, except per share)	1990	1989	1988
Common Stock:			
Balance, January 1	$ 164	$ 164	$ 164
Par value of stock issued in two-for-one stock split	165		
Balance, December 31	$ 329	$ 164	$ 164
Additional Contributed Capital:			
Balance, January 1	$ 877	$ 874	$ 872
Employee stock plans	2	3	2
Par value of stock issued in two-for-one stock split	(165)		
Balance, December 31	$ 714	$ 877	$ 874
Accumulated Currency Adjustment:			
Balance, January 1	$ 24	$ 52	$ 100
Translation adjustments	171	(17)	(53)
Income taxes	(7)	(11)	5
Balance, December 31	$ 188	$ 24	$ 52
Reinvested Earnings:			
Balance, January 1	$ 4,120	$ 3,662	$ 3,282
Net income	546	679	591
Dividends	(242)	(221)	(211)
Common stock purchase rights redemption	(3)		
Balance, December 31	$ 4,421	$ 4,120	$ 3,662
Treasury Stock:			
Balance, January 1	$(1,244)	$ (952)	$ (517)
Shares purchased[1] (6,707,900; 6,548,800 and 11,210,600 shares in 1990-1988, respectively)	(326)	(335)	(457)
Shares issued under employee stock plans[1] (193,072; 1,177,322 and 679,926 shares in 1990-1988, respectively)	7	43	22
Balance, December 31	$(1,563)	$(1,244)	$ (952)

The above statement should be read in conjunction with pages 42 through 47 of this report.

KEY FINANCIAL STATISTICS[1]		1990	1989	1988
Stock Price[2]	High	$ 60⅛	$ 62⅛	$ 46¼
	Low	38¾	40¼	36¾
	Year-end	48¼	57¾	40⅞
Per Share	Dividends	1.88	1.65	1.475
	Shareowners' Equity	32.51	29.79	27.60
Average Daily Share Trading Volume (thousands of shares)		425	426	646

[1]Adjusted for the 1990 two-for-one common stock split.
[2]Based on daily reported high and low stock prices.

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Where applicable, per share amounts and the number of shares have been restated to reflect the May 1990 two-for-one common stock split effected in the form of a stock dividend.

SIGNIFICANT ACCOUNTING POLICIES

Monsanto's significant accounting policies are italicized in the following Notes to Financial Statements.

BASIS OF CONSOLIDATION

The consolidated financial statements include the Company and its majority-owned subsidiaries. Intercompany transactions have been eliminated in consolidation. Other companies in which Monsanto has a significant ownership interest (generally greater than 20 percent) are included in "Investments in Affiliates" in the Statement of Consolidated Financial Position, and Monsanto's share of these companies' income or loss is included in "Other income – net" in the Statement of Consolidated Income.

CURRENCY TRANSLATION

Most of Monsanto's ex-U.S. entities' financial statements are translated into U.S. dollars using current exchange rates. Unrealized currency adjustments in the Statement of Consolidated Financial Position are accumulated in shareowners' equity. The financial statements of ex-U.S. entities that operate in hyperinflationary economies, including Brazil, Mexico and Argentina, are translated at either current or historical exchange rates, as appropriate. These currency adjustments are included in net income.

Major currencies are the U.S. dollar, British pound sterling and Belgian franc. Other important currencies include the Brazilian cruzeiro, Canadian dollar, French franc, German mark, Italian lira, Japanese yen and Mexican peso. Currency restrictions are not expected to have a significant effect on Monsanto's cash flow, liquidity or capital resources.

Currency forward and option contracts are utilized to manage currency exposure. At December 31, 1990, Monsanto had currency forward contracts to purchase $136 million and sell $372 million of other currencies, principally the British pound sterling and German mark. *These contracts are recorded at market value. Gains and losses on contracts that are designated and effective as hedges are recognized in the period of the exposure being hedged. Gains and losses on other currency forward and option contracts are included in net income immediately.* Monsanto is subject to loss in the event of nonperformance by the counterparties to these contracts.

PRINCIPAL ACQUISITIONS AND DIVESTITURES

In June 1990, certain assets of a Monsanto joint venture in Japan were sold. Monsanto recognized a pre-tax gain of $45 million ($31 million after-tax gain and $0.24 per share) on the sale of these assets.

In October 1989, Searle acquired Heumann Pharma GmbH & Co., a German pharmaceuticals firm. The acquisition was accounted for using the purchase method. Intangible assets in 1989 increased by $93 million as a result of this acquisition. Monsanto's Statement of Consolidated Income for 1989 included Heumann's results of operations for the period October through December.

During November 1989, Monsanto sold its analgesics business (with net sales of $70 million for the first 10 months of 1989 and $75 million for the full-year 1988). A pre-tax gain of $56 million ($36 million after-tax gain and $0.27 per share) was recognized on the sale of this business.

In March 1989, Monsanto sold its Electronic Materials business.

Searle's Italian pharmaceuticals subsidiary was merged with another Italian pharmaceuticals company in September 1988. The acquisition was accounted for using the purchase method. This transaction increased intangible assets $50 million.

Monsanto's Australian commodity chemicals and plastics businesses (with net sales of $60 million for the first quarter of 1988) were sold in March 1988.

The pro forma operating results of the acquired businesses and the operating income effect of the divested businesses were not material. The net income impact from the sales of the Electronic Materials and Australian businesses was not material.

RESTRUCTURING

In October 1990, the Board of Directors approved a restructuring of the Agricultural Products operating unit. The restructuring actions included a reorganization of the operating unit along product lines and a decision to sell the animal feed ingredients business. In line with these actions, reductions in employment occurred through an early retirement incentive and other programs.

The cost of the restructuring is estimated to be $108 million, the largest of which relates to the reductions in employment. The sale of the animal feed ingredients business is expected to result in a gain in excess of the restructuring costs. Accordingly, the restructuring costs have been deferred until the animal feed ingredients business is sold. Management expects the restructuring to be completed in 1991.

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DEPRECIATION AND AMORTIZATION

	1990	1989	1988
Depreciation	$465	$438	$435
Amortization of intangible assets	235	226	231
Obsolescence	89	26	37
Total	$789	$690	$703

Property, plant and equipment is recorded at cost. The cost of plant and equipment is depreciated over weighted average periods of 23 years for buildings and 12 years for machinery and equipment, using the straight-line method.

Intangible assets are recorded at cost less accumulated amortization. The components of intangible assets and their estimated remaining useful lives were:

	Estimated Remaining Life*	1990	1989
Goodwill	32	$ 679	$ 737
Patents	4	482	679
Other intangible assets	19	264	266
Total		$1,425	$1,682

**Weighted average, in years, at December 31, 1990.*

Goodwill is the cost of acquired businesses in excess of the fair value of their identifiable net assets and is amortized over the estimated periods of benefit (5 to 40 years). Patents obtained in a business acquisition are recorded at the present value of estimated future cash flows resulting from patent ownership. The cost of patents is amortized over their legal lives. The cost of other intangible assets (principally product rights and trademarks) is amortized over their estimated useful lives.

INVENTORY VALUATION

Inventories are stated at cost or market, whichever is less. Actual cost is used to value raw materials and supplies; standard cost, which approximates actual cost, is used to value finished goods and goods in process. Standard cost includes direct labor, raw material and manufacturing overhead based on practical capacity. The cost of 58 percent of all inventories is determined using the last-in, first-out (LIFO) method, generally reflecting the effects of inflation or deflation on cost of goods sold sooner than other inventory cost methods. The cost of other inventories generally is determined using the first-in, first-out (FIFO) method.

The components of inventories were:

	1990	1989
Finished goods	$ 781	$ 723
Goods in process	349	314
Raw materials and supplies	555	506
Inventories, at FIFO cost	1,685	1,543
Excess of FIFO over LIFO cost	(415)	(346)
Total	$1,270	$1,197

Inventories at FIFO cost approximate current cost.

INCOME TAXES

The components of income before income taxes were:

	1990	1989	1988
U.S.	$513	$ 570	$481
Ex-U.S.	296	445	412
Total	$809	$1,015	$893

The components of income tax expense were:

	1990	1989	1988
Current:			
Federal	$123	$138	$111
State	18	18	18
Ex-U.S.	96	142	139
	237	298	268
Deferred:			
Federal	24	26	31
State	1	3	1
Ex-U.S.	1	9	2
	26	38	34
Total	$263	$336	$302

Deferred taxes result from timing differences in the recognition of revenue and expense for tax and financial statement purposes. The source of these timing differences and the tax effect of each were:

	1990	1989	1988
Depreciation and obsolescence	$10	$25	$28
Restructuring program	19	16	31
Pensions	7	10	(12)
Other	(10)	(13)	(13)
Total	$26	$38	$34

TOWOLDMON0015627

Factors causing Monsanto's effective tax rate to differ from the United States federal statutory rate were:

	1990	1989	1988
Federal statutory rate	34%	34%	34%
Benefits attributable to:			
United States export earnings	(2)	(2)	(2)
Puerto Rico operations	(2)	(2)	(1)
Other	3	3	3
Effective income tax rate	33%	33%	34%

Income and remittance taxes have not been recorded on $659 million of undistributed earnings of subsidiaries, either because any taxes on dividends would be offset substantially by foreign tax credits or because Monsanto intends to indefinitely reinvest those earnings.

The Financial Accounting Standards Board has issued Statement of Financial Accounting Standards No. 96 "Accounting for Income Taxes." This statement changes the method of calculating deferred income taxes and must be adopted in or before 1992. Monsanto has not yet adopted this statement which will have no effect on cash flow and, under existing tax laws, is not expected to have a material effect on Monsanto's financial position, liquidity or future results of operations.

SHORT-TERM DEBT AND CREDIT ARRANGEMENTS

Short-term debt was:

	1990	1989
Notes payable:		
Banks	$ 58	$145
Commercial paper	272	182
Bank overdrafts	134	134
Current portion of long-term debt	118	44
Total	$582	$505
Maximum amount of notes payable and bank overdrafts outstanding at any month-end	$715	$857
Average notes payable and bank overdrafts outstanding	514	623
Weighted average interest rate during the year	9.7%	9.9%
Weighted average interest rate at December 31	7.1%	9.7%

Monsanto has aggregate short-term loan facilities of $443 million, under which loans totaling $58 million were outstanding at December 31, 1990. Interest on these loans is related to various bank rates. Monsanto's worldwide unused short-term loan facilities were $385 million at December 31, 1990.

LONG-TERM DEBT

Long-term debt (exclusive of current maturities) was:

	1990	1989
Industrial development bond obligations, rates ranging from 5.3% to 11.9%, due 1992 to 2021	$ 363	$ 266
Medium-term notes, rates ranging from 7.6% to 9.5%, due 1992 to 1999	196	50
Commercial paper to be refinanced on a long-term basis, weighted average rate of 8.2%	193	
10⅛% notes due 1992		150
9⅝% notes due 1996	150	150
8½% sinking fund debentures due 2000	106	127
8¾% sinking fund debentures due 2008	145	170
8⅞% debentures due 2009	99	99
11⅝% sinking fund debentures due 2015	200	214
Other	200	245
Total	$1,652	$1,471

Maturities and sinking fund requirements on long-term debt are $118 million, $54 million, $84 million, $47 million and $75 million for 1991-1995, respectively.

Interest rate swap options (interest options) are utilized to manage interest expense. At December 31, 1990, Monsanto had sold interest options with an aggregate notional principal amount of $207 million related to existing long-term debt. One interest option would effectively convert $99 million of 8⅞% debentures to commercial paper rates in the period 1994 through 2000. Additional interest options would effectively convert $108 million of variable rate debt to fixed rates ranging from 8⅞% to 9⅛% in the period 1991 to 2000. *Premiums from the sale of interest options are amortized over the related debt period. Interest differentials to be paid or received are accrued as interest rates change over the related debt period.*

A $750 million intermediate-term credit facility expires ratably from 1991 to 1994. There were no borrowings under this facility at December 31, 1990. The credit facility is used to support the issuance of commercial paper ($465 million outstanding at December 31, 1990). Interest on amounts borrowed under this agreement would likely be at money market rates.

Covenants under this credit facility restrict maximum borrowings. It is not anticipated that future borrowings will be limited by these restrictions.

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PENSION BENEFITS

Most Monsanto employees are covered by noncontributory pension plans. The components of pension cost (income) were:

	1990	1989	1988
Service cost for benefits earned during the year	$ 67	$ 63	$ 65
Interest cost on projected benefit obligation	242	227	223
Assumed return on plan assets*	(278)	(251)	(246)
Amortization of unrecognized net gain	(47)	(40)	(38)
Total	$ (11)	$ (1)	$ 4

**Actual return (loss) on plan assets was $(85) million in 1990, $658 million in 1989 and $340 million in 1988.*

Pension benefits are determined based on the employee's years of service and compensation level. Pension plans are funded in accordance with Monsanto's long-range projections of the plans' financial conditions, considering benefits earned and expected to be earned in the future, anticipated future returns on pension plan assets and income tax and other regulations.

Assumptions used for the principal plans in 1990-88 were:

Discount rate	8¼%
Assumed long-term rate of return on plan assets	8½%
Annual rates of salary increase (for plans that base benefits on final compensation level)	6½%

The funded status of Monsanto's pension plans at year-end was:

	1990	1989
Plan assets at fair value	$3,460	$3,647
Actuarial present value of plan benefits:		
Vested	$2,628	$2,299
Nonvested	135	122
Accumulated benefit obligation	2,763	2,421
Effect of projected future salary increases	407	347
Projected benefit obligation	$3,170	$2,768
Excess of plan assets over projected benefit obligation	$ 290	$ 879
Less:		
Unrecognized initial net gain	320	341
Unrecognized prior service costs	(190)	(22)
Unrecognized subsequent net gain	286	683
Accrued net pension liability	$ 126	$ 123
The accrued net pension liability was included in:		
Other assets	$ 74	$ 53
Other liabilities	200	176
Accrued net pension liability	$ 126	$ 123

Projected benefit obligations and plan assets included in the above table for the principal U.S. plans were approximately $2,814 million and $3,087 million, respectively, at December 31, 1990. Plan assets consist principally of common stocks and U.S. government and corporate obligations. Because the Company's pension plans are well-funded, contributions to the Company's principal plans were neither required nor made in 1990-1988.

For some employee savings plans, employee contributions are matched in part by Monsanto. The 1990-1988 expense recorded for such plans was $34 million, $32 million and $34 million, respectively.

OTHER POSTRETIREMENT BENEFITS

Monsanto provides certain health care and life insurance benefits for retired employees. Substantially all of Monsanto's regular, full-time U.S. employees and certain employees in other countries may become eligible for these benefits if they reach retirement age while employed by Monsanto.

At December 31, 1990, approximately 26,000 active employees were eligible upon retirement to participate in these programs. In addition, approximately 18,000 individuals retired from active service were eligible to participate in these programs. *These other postretirement benefits are not funded and are expensed as benefits are paid.* The 1990-1988 expense recorded for other postretirement benefits was $45 million, $39 million and $38 million, respectively.

The Financial Accounting Standards Board has issued Statement of Financial Accounting Standards No. 106 "Employers' Accounting for Postretirement Benefits Other Than Pensions." This statement, which must be adopted in or before 1993, changes the method of accounting for other postretirement benefits by requiring that the cost be accrued by the date employees become eligible for the benefits. In accordance with the statement, the estimated obligation for other postretirement benefits may be recognized as expense in the year of adoption or may be accrued on a straight-line basis over a 20-year period. Monsanto has not decided the year in which it will adopt the new statement, or whether the estimated obligation will be recognized as expense in the year of adoption or over a 20-year period. In addition, the Company is considering modifications to its medical benefits programs for future retirees, so it cannot currently determine the financial impact of the new statement.

TOWOLDMON0015629

STOCK OPTION PLANS

Key officers and employees have been granted Monsanto stock options under the Company's 1974, 1984 and 1988 Management Incentive Plans and the Searle Monsanto Stock Option Plan (Searle Plan). Information about the status of such stock options, adjusted for the 1990 two-for-one stock split, is presented below.

	Shares		Price
	Exercisable	Outstanding	per Share
December 31, 1988	2,639,590	6,626,710	$13.08 - $47.10
1989:			
Granted		1,238,042	40.60 - 61.44
Exercised		(1,361,168)	13.08 - 47.10
Expired		(98,786)	15.69 - 47.10
December 31, 1989	2,631,468	6,404,798	13.08 - 61.44
1990:			
Granted		1,087,417	41.13 - 54.94
Exercised		(335,076)	13.08 - 47.09
Expired		(105,610)	13.08 - 54.94
December 31, 1990	3,360,357	7,051,529	15.69 - 61.44

Under the 1988 Management Incentive Plans and the Searle Plan, 5,448,639 shares remain available for grant.

Stock appreciation rights (SARs) have been authorized to be granted to certain Monsanto officers in tandem with stock options under the plans, including retroactive grants for unexercised options. SARs may be exercised in lieu of stock options included in the table above. At December 31, 1990, SARs related to stock options for 2,359,097 shares were outstanding, of which 863,015 options were exercisable. During 1990, SARs related to stock options for 137,289 shares were granted and for 44,936 shares were exercised.

EARNINGS PER SHARE

Earnings per share were computed using the weighted average number of common shares and common share equivalents outstanding each year, adjusted for the 1990 two-for-one stock split (129,107,666; 135,496,104 and 143,002,644 in 1990-1988, respectively). Common share equivalents (676,393; 1,073,554 and 689,972 in 1990-1988, respectively) consist primarily of common stock issuable upon exercise of outstanding stock options. Earnings per share assuming full dilution were not significantly different from the primary amounts.

CAPITAL STOCK

At December 31, 1990, there were 12,500,168 common shares reserved for employee stock options.

In January 1990, the Company's Board of Directors declared a dividend of one Preferred Stock Purchase Right on each outstanding share of the Company's common stock. If a person or group acquires beneficial ownership of 20 percent or more, or announces a tender offer that would result in beneficial ownership of 20 percent or more, of the Company's outstanding common stock, the rights become exercisable and each right will entitle its holder to purchase one one-hundredth of a share of a new series of preferred stock for $450. If Monsanto is acquired in a business combination transaction while the rights are outstanding, each right will entitle its holder to purchase, for $450, common shares of the acquiring company having a market value of $900. In addition, if a person or group acquires beneficial ownership of 20 percent or more of the Company's outstanding common stock, each right will entitle its holder (other than such person or members of such group) to purchase, for $450, a number of shares of the Company's common stock having a market value of $900. Furthermore, at any time after a person or group acquires beneficial ownership of 20 percent or more (but less than 50 percent) of the Company's outstanding common stock, the Board of Directors may, at its option, exchange part or all of the rights (other than rights held by the acquiring person or group) for shares of the Company's common stock on a one-for-one basis. At any time prior to the acquisition of such a 20 percent position, the Company can redeem each right for 1 cent. The Board of Directors is also authorized to reduce the 20 percent thresholds referred to above to not less than 10 percent. The rights expire in the year 2000.

In connection with this dividend declaration, the Board of Directors also authorized the redemption in February 1990 of the then existing Common Stock Purchase Rights at their redemption price of 5 cents per right.

TOWOLDMON0015630

COMMITMENTS AND CONTINGENCIES

Commitments, principally in connection with uncompleted additions to property, were approximately $173 million at December 31, 1990. Monsanto was contingently liable as guarantor of bank loans and for discounted customers' receivables totaling approximately $209 million at December 31, 1990. Future minimum payments under noncancellable operating leases and unconditional inventory purchases are $176 million; $143 million; $98 million; $69 million and $54 million for 1991-1995, respectively, and $218 million thereafter.

At December 31, 1990, the more significant concentrations in Monsanto's trade receivables were from U.S. and European agricultural product distributors, $150 million and $90 million, respectively, and pharmaceutical distributors, $283 million. Management does not anticipate incurring losses on its trade receivables in excess of established allowances.

Monsanto is a party to a number of lawsuits, which it is vigorously defending, arising in the normal course of business. Certain of these actions seek damages in very large amounts. While the results of litigation cannot be predicted with certainty, management believes, based upon the advice of Company counsel, that the final outcome of such litigation will not have a material adverse effect on Monsanto's consolidated financial position.

SUPPLEMENTAL DATA

Supplemental income statement data were:

	1990	1989	1988
Raw material and energy costs	$2,741	$2,659	$2,587
Employee compensation and benefits	2,184	2,045	2,022
Current income and other taxes	533	562	527
Rent expense	143	119	115
Technological expenses:			
Research and development	612	598	575
Engineering, commercial development and patent	80	74	73
Total technological expenses	692	672	648
Interest expense:			
Total interest cost	208	204	193
Less capitalized interest	(29)	(22)	(19)
Net interest expense	179	182	174
Currency gains (losses) including equity in affiliates' currency gains and losses	(45)	(31)	(20)

SEGMENT INFORMATION

Certain operating unit segment data and geographic data for 1990-1988 appear on pages 27 and 34 and are integral parts of the accompanying financial statements. The principal product lines included in each operating unit are shown in the operating unit segment data.

Sales between operating units were not significant. Inter-area sales, which are sales between Monsanto locations in different world areas, were made on a market price basis.

Certain corporate expenses, primarily those related to the overall management of Monsanto, were not allocated to the operating units or geographic areas. Corporate assets principally include certain miscellaneous receivables and investments.

Inter-area sales by entities in each geographic area were:

	Inter-area Sales (Between Monsanto Entities)		
	1990	1989	1988
World area shipped from:			
United States	$ 813	$ 817	$ 855
Europe-Africa	140	180	167
Canada	13	11	13
Latin America	19	35	22
Asia-Pacific	1	11	39
Inter-area Eliminations	(986)	(1,054)	(1,096)
Total	$ —	$ —	$ —

Following is a reconciliation of ex-U.S. operating income and total assets to the net income and net assets of consolidated ex-U.S. subsidiaries.

	1990	1989	1988
Operating income	$ 326	$ 415	$ 383
Interest expense	(43)	(50)	(54)
Interest income	86	57	45
Other income (expense) — net	(21)	23	38
Income taxes	(97)	(151)	(141)
Net income of consolidated ex-U.S. subsidiaries	$ 199	$ 294	$ 271
Total operating assets	$2,996	$ 2,449	$ 2,316
Total liabilities	1,125	983	1,040
Net assets of consolidated ex-U.S. subsidiaries	$1,871	$ 1,466	$ 1,276

TOWOLDMON0015631

FINANCIAL SUMMARY

(Dollars in millions, except per share)	1990[2]	1989[3]	1988	1987[4]	1986[5]
Operating Results					
Net Sales	$8,995	$8,681	$8,293	$7,639	$6,879
Operating Income	909	1,078	955	784	635
As a Percent of Net Sales	10%	12%	12%	10%	9%
Net Income	546	679	591	436	433
As a Percent of Net Sales	6%	8%	7%	6%	6%
Return on Shareowners' Equity	13.6%	17.6%	15.4%	11.4%	12.0%
Earnings per Share[1]	$ 4.23	$ 5.01	$ 4.14	$ 2.82	$ 2.78
Year-end Financial Position					
Total Assets	$9,236	$8,604	$8,461	$8,455	$8,269
Working Capital	1,323	1,326	1,117	1,203	1,092
Property, Plant and Equipment:					
Gross	$7,620	$6,937	$6,926	$6,730	$6,326
Net	3,492	3,173	3,146	3,076	2,913
Long-Term Debt	$1,652	$1,471	$1,408	$1,564	$1,630
Shareowners' Equity	4,089	3,941	3,800	3,901	3,781
Current Ratio	1.6	1.7	1.6	1.7	1.6
Percent of Total Debt to Total Capitalization	35%	33%	34%	35%	35%
Other Data					
Property, Plant and Equipment Purchases	$ 750	$ 607	$ 590	$ 505	$ 520
Depreciation and Amortization	739	690	703	679	780
Interest Expense	179	182	174	172	201
Research and Development Expenses	612	598	575	557	523
Income Taxes	263	336	302	237	203
Cash Provided by Operations	1,104	1,037	1,304	902	960
Stock Price:[1]					
High	$ 60⅛	$ 62⅛	$ 46¼	$ 50⅛	$ 40¾
Low	38¾	40¼	36¾	28½	22⅝
Year-end	48¼	57¾	40⅞	41½	38¼
Price/Earnings Ratio on Year-end Stock Price	11	12	10	15	14
Per Share:[1]					
Dividends	$ 1.88	$ 1.65	$1.475	$1.375	$1.288
Shareowners' Equity	$2.51	29.79	27.60	26.32	24.34
Shareowners (year-end)	62,230	61,942	66,066	68,032	70,367
Shares Outstanding (year-end, in millions)[1]	126	132	138	148	155
Employees (year-end)	41,081	42,179	45,635	49,784	51,703

[1] Per share amounts and shares outstanding have been restated to reflect the May 1990 two-for-one stock split.

[2] Net income for 1990 includes $56 million ($0.43 per share) in gains resulting from divestitures, including the divestiture of certain assets of a joint venture in Japan.

[3] Net income for 1989 includes a $36 million ($0.27 per share) gain on the sale of the analgesics business.

[4] Net income for 1987 includes net restructuring income of $18 million ($0.12 per share).

[5] Net income for 1986 includes $85 million ($0.55 per share) of net gains, principally from the sale of the Texas City, Texas, petrochemicals plant and related assets, partially offset by the Electronic Materials asset impairment write-down.

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OFFICERS

Chairman and Chief Executive Officer

Richard J. Mahoney

President and Chief Operating Officer

Earle H. Harbison, Jr.

Executive Vice Presidents

Robert G. Potter
Nicholas L. Reding
Robert B. Shapiro

Senior Vice President and Chief Financial Officer

Francis A. Stroble

Senior Vice President, Secretary and General Counsel

Richard W. Duesenberg

Vice Presidents

Barry Blitstein
Earl N. Brasfield
Leonard A. Cohn
Grant W. Denison, Jr.
A. Nicholas Filippello, Ph.D.
Martin J. Kallen
Thomas H. Lafferre
Michael E. Miller
Philip Needleman, Ph.D.
Richard A. Overton
James H. Senger
David L. Sliney
Virginia V. Weldon, M.D.

Vice President, Finance

Lawrence B. Skatoff

Vice President and Treasurer

Juanita H. Hinshaw

MONSANTO ADVISORY DIRECTORS

Michael E. Miller
St. Louis
Vice President, Administration, Monsanto Company
Age: 49
Advisory Director: less than 1 year

Philip Needleman, Ph.D.
St. Louis
Vice President, Research and Development, Monsanto Company
Age: 52
Advisory Director: less than 1 year

Robert G. Potter
St. Louis
Executive Vice President, Monsanto Company; President, Monsanto Chemical Company
Age: 51
Advisory Director: 5 years

Nicholas L. Reding
St. Louis
Executive Vice President, Environment, Safety, Health and Manufacturing, Monsanto Company
Age: 56
Advisory Director: 9 years

Robert B. Shapiro
St. Louis
Executive Vice President, Monsanto Company; President, Monsanto Agricultural Company
Age: 52
Advisory Director: less than 1 year

Francis A. Stroble
St. Louis
Senior Vice President and Chief Financial Officer, Monsanto Company
Age: 60
Advisory Director: 9 years

Virginia V. Weldon, M.D.
St. Louis
Vice President, Public Policy, Monsanto Company
Age: 55
Advisory Director: less than 1 year

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Richard J. Mahoney
St. Louis
Chairman and Chief Executive Officer,
Monsanto Company
Age: 57
Monsanto Director: 12 years

Marguerite Ross Barnett, Ph.D.
Houston
President,
University of Houston
Age: 48
Monsanto Director: 3 years

Joan T. Bok
Westborough, Massachusetts
Chairman,
New England Electric System
Age: 61
Monsanto Director: 4 years

Donald C. Carroll, Ph.D.
West Conshohocken, Pennsylvania
Chairman, Schulco, Inc.;
Retired Dean,
The Wharton School,
University of Pennsylvania
Age: 60
Monsanto Director: 16 years

Earle H. Harbison, Jr.
St. Louis
President and Chief Operating Officer,
Monsanto Company
Age: 62
Monsanto Director: 5 years

Robert M. Heyssel, M.D.
Baltimore
President and Chief Executive Officer,
The Johns Hopkins
Health System and
The Johns Hopkins Hospital
Age: 62
Monsanto Director: 2 years

Philip Leder, M.D.
Boston
Chairman, Department of Genetics,
Harvard Medical School;
Senior Investigator,
Howard Hughes Medical Institute
Age: 56
Monsanto Director: 1 year

Howard M. Love
Pittsburgh
Chief Executive Officer,
National Intergroup, Inc.
Age: 60
Monsanto Director: 13 years

Frank A. Metz, Jr.
Armonk, New York
Senior Vice President,
Finance and Planning, and
Chief Financial Officer,
International Business Machines
Corporation
Age: 57
Monsanto Director: 1 year

Buck Mickel
Greenville, South Carolina
Chairman and Chief Executive Officer,
R.S.I. Holdings, Inc.;
Retired Vice Chairman,
Fluor Corporation;
Retired Chairman,
Daniel International Corporation,
a Fluor subsidiary
Age: 65
Monsanto Director: 16 years

John S. Reed
New York
Chairman, Citicorp and
Citibank, N.A.
Age: 52
Monsanto Director: 6 years

William D. Ruckelshaus
Houston
Chairman and Chief Executive Officer,
Browning-Ferris Industries, Inc.;
Former Administrator,
U.S. Environmental
Protection Agency
Age: 58
Monsanto Director: 6 years

John B. Slaughter, Ph.D.
Los Angeles
President, Occidental College;
Former Director,
National Science Foundation
Age: 56
Monsanto Director: 8 years

Admiral Stansfield Turner
(U.S. Navy, Retired)
McLean, Virginia
Lecturer and Writer;
Former Olin Professor of
National Security,
U.S. Military Academy at West Point;
Former Director,
U.S. Central Intelligence and
Central Intelligence Agency
Age: 67
Monsanto Director: 10 years

TOWOLDMON0015634

COMMITTEES OF THE BOARD

Audit Committee

Buck Mickel, *Chairman*
Joan T. Bok
Robert M. Heyssel, M.D.
William D. Ruckelshaus
John B. Slaughter, Ph.D.

Corporate Social Responsibility Committee

Admiral Stansfield Turner, *Chairman*
Joan T. Bok
William D. Ruckelshaus
John B. Slaughter, Ph.D.

Executive Committee

Richard J. Mahoney, *Chairman*
Marguerite Ross Barnett, Ph.D.
Earle H. Harbison, Jr.
John B. Slaughter, Ph.D.

Executive Compensation and Development Committee

Howard M. Love, *Chairman*
Frank A. Metz, Jr.
Buck Mickel

Finance Committee

John S. Reed, *Chairman*
Marguerite Ross Barnett, Ph.D.
Donald C. Carroll, Ph.D.
Richard J. Mahoney
Frank A. Metz, Jr.

Nominating Committee

Buck Mickel, *Chairman*
Howard M. Love
Frank A. Metz, Jr.

Pension and Savings Funds Committee

Donald C. Carroll, Ph.D., *Chairman*
Earle H. Harbison, Jr.
Robert M. Heyssel, M.D.
Philip Leder, M.D.
Admiral Stansfield Turner

SHAREOWNER INFORMATION

Annual Meeting

The next annual meeting of the shareowners of Monsanto Company will be held at 1:45 p.m., Friday, April 26, 1991, in K Building at the company's world headquarters, 800 N. Lindbergh Blvd., St. Louis, Missouri. A formal notice of the meeting, together with a proxy statement, is being mailed to each shareowner.

10-K Report, Corporate Data Book and Investor News

Monsanto Company's 1990 Form 10-K Report filed with the Securities and Exchange Commission; the 1990 Corporate Data Book, which contains additional information relating to Monsanto; and copies of Investor News, a periodic newsletter for investors, can be obtained by contacting:

Investor Relations Department

Monsanto Company
800 N. Lindbergh Blvd.
St. Louis, Missouri 63167
(314) 694-1000

Stock Symbol — MTC

Stock Exchanges/Bourses

Amsterdam	London
Brussels	New York
Chicago (options)	Paris
Frankfurt	Tokyo
Geneva	Zurich

Transfer Agent and Registrar

The First National Bank of Boston
Box 644
Boston, Massachusetts 02102-0644

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