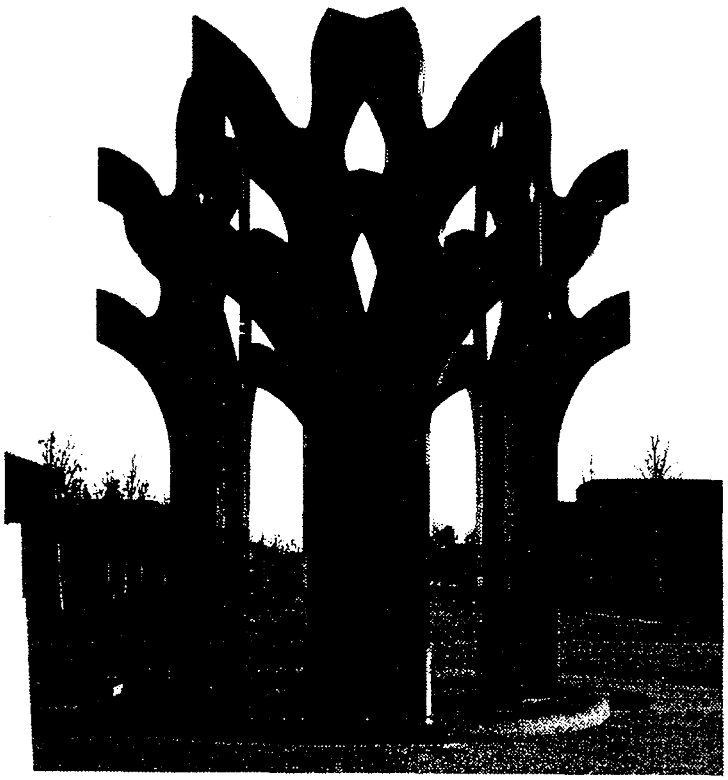
Monsanto

DELIVERING ON COMMITMENTS



1989

ANNUAL REPORT

DSW 021824

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About the Cover

The Branches of Promise, located at Monsanto's world headquarters in St. Louis, Missouri, is a 15-foot sculpture made of glass and *Saflex* plastic interlayer, a Monsanto product. The name comes from a line in an 18th-century hymn: "making the branches of promise grow."

Sculpted by British-born artist Edwina Sandys, the tree image of many branches and a unifying trunk captures the spirit of Monsanto — a company whose values join its employees together in their continued effort to deliver on commitments.

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Monsanto's Commitments

Monsanto Company makes and markets high-value chemical and agricultural products, pharmaceuticals, low-calorie sweeteners, industrial process equipment, man-made fibers, plastics and other performance materials. In doing so, we are committed to serving the interests of all our stake holders around the world by:

- Aiming for a consistent and superior return on equity for our shareowners;
- Meeting the needs of customers with the highest standards of value, quality and service;
- Providing 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 neighbors.

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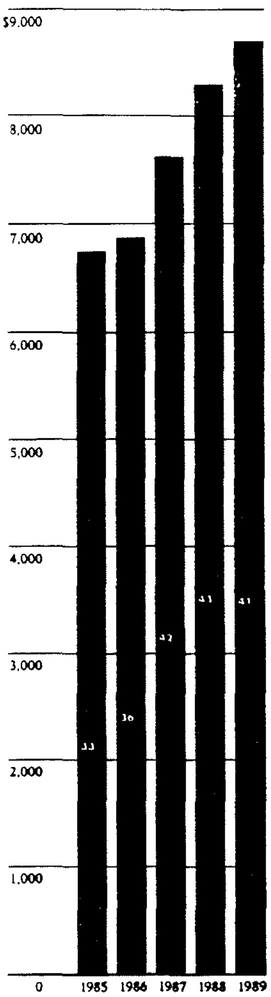
Operational Highlights

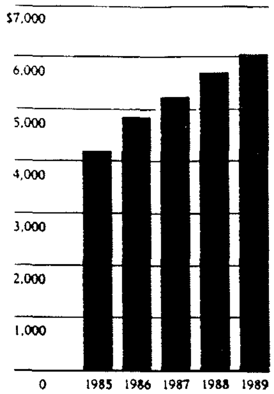
(Dollars in millions, except per share)	**1989**	1988	1987
Net Sales	**$ 8,681**	$ 8,293	$ 7,639
Net Income	**$ 679**	$ 591	$ 436
Per Share:			
Net Income	**$ 10.03**	$ 8.27	$ 5.63
Dividends	**3.30**	2.95	2.75
Shareowners' Equity	**59.58**	55.21	52.65
Depreciation and Amortization	**$ 690**	$ 703	$ 679
Cash Provided by Operations	**$ 1,037**	$ 1,304	$ 902
Research and Development Expenses	**$ 598**	$ 575	$ 557
Return on Shareowners' Equity	**17.6%**	15.4%	11.4%
Percent of Total Debt to Total Capitalization	**33%**	34%	35%
Shareowners (year-end)	**61,942**	66,066	68,032
Shares Outstanding (year-end, in millions)	**66**	69	74
Employees (year-end)	**42,179**	45,635	49,734

Global Sales
(dollars in millions)



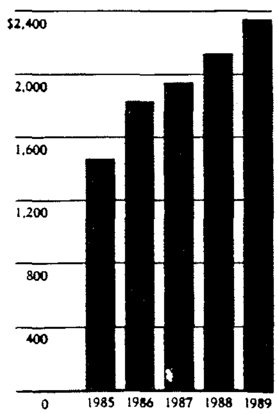
Sales in the United States
Sales outside the United States

Value Added
(dollars in millions)

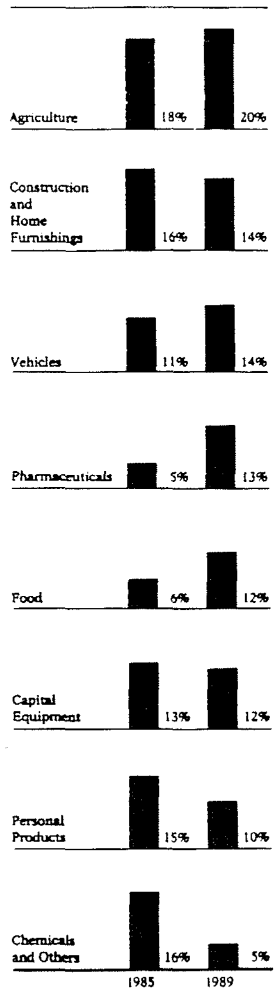


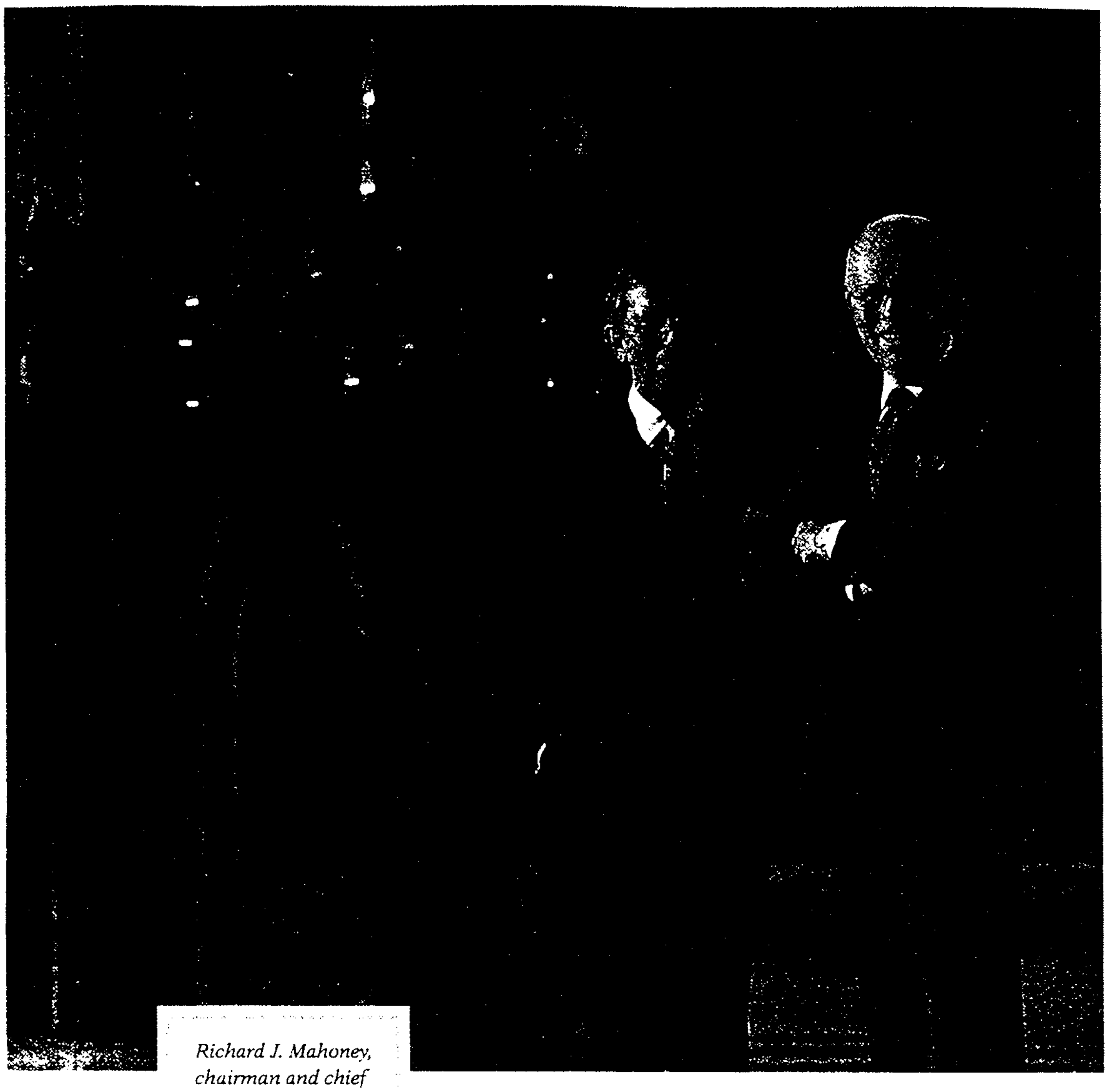
Value Added
(Sales less energy and raw materials)

Marketing, Administration and Technology Expenses
(dollars in millions)



Market Mix
(percent of total sales)





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

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Delivering on Commitments

The statement on the cover of this report — "Delivering on Commitments" — makes a strong assertion. Over the past several years, we have stated publicly our commitment to rewards for those who hold a stake in Monsanto — importantly, shareowners, customers, employees and neighbors.

In 1989, we took a major step toward the fulfillment of those promises.

For the fourth year in a row, we increased earnings: Net income was up 15 percent over 1988 to $679 million. Earnings per share increased by 21 percent to $10.03. Nonrecurring gains from the sale of assets and other items were about the same in both years.

The principal financial goal of the corporation is to reach and sustain a 20 percent return on shareowners' equity (ROE). In 1989, we took another positive step toward that goal with ROE of 17.6 percent, up from 15.4 percent in 1988.

We used our strong cash position in 1989 to repurchase 3.3 million shares of stock and to increase quarterly dividends by 13 percent, the 17th year in a row of dividend increases.

Monsanto's second consecutive year of record sales and earnings is a direct result of the individual accomplishments of our operating units in increasing the *number* of product lines contributing to our gains.

When you look at the Chemical Company as one unit with $497 million in operating income, the breadth of the unit's overall product strength can be obscured. Nylon carpet fibers, *Saflex* plastic interlayer and many other value-added performance materials are the major reasons the Chemical Company has prospered and reduced its dependence on cyclical markets.

Today, only about one-half of the unit's sales are tied to industrial business cycles, down from three-fourths several years ago. This, in turn, has brought Monsanto's aggregate cyclical businesses to less than one-third of total corporate sales. Just as strong markets worldwide supported Chemical Company sales in 1989, the unit's increasing global involvement insulated it from regional economic downturns.

After nearly five years of investment since its acquisition, Searle had a positive operating income for the first time at $6 million, led by *Calan* SR antihypertensive drug, now one of the top 15 U.S. pharmaceuticals in sales. Earnings at Searle now have the potential to grow dramatically with an impressive pipeline of new products.

The NutraSweet Company contributed $180 million in earnings, with strong worldwide growth particularly in the carbonated soft drink segment. New uses for *NutraSweet* brand sweetener abound. Nearly 500 new products sweetened with *NutraSweet* were introduced in 1989, bringing the total to more than 3,000.

Operating income for the Agricultural Products' Crop Chemicals unit increased more than 9 percent to $474 million. *Lasso* and *Avadex* herbicides posted gains in sales, and *Roundup* herbicide showed another dramatic increase, with volumes up 25 percent. In the unit's Animal Sciences Division, profits have been affected by competitive pricing pressures and product development programs.

Fisher Controls achieved the sales and earnings surge we have been confident could be demonstrated. Operating income more than doubled to $64 million, with *PROVOX*plus process control systems becoming an increasingly important contributor.

Monsanto's sales and earnings are well balanced around the world. All world areas saw growth in continuing businesses, with 41 percent of our total sales in markets outside the United States. While that percentage is down somewhat from 1988's 43 percent, our global position is actually stronger than at any other time in our history. Where sales were down, it was because of divestitures that moved us further away from commodity products and toward a stronger, higher-value-added product portfolio.

In spite of our second consecutive record year, it is important to acknowledge that we aren't there yet. Monsanto's long-term goals will be fulfilled only through the continuing extraordinary efforts of our people *and* our continuing investment in future products.

With our improved cash flow position, we reinvested $598 million in research and development for new or improved products and $607 million in capital to reduce costs, expand capacity and improve the environment. Our R&D expenditures remain high — 7 percent of sales — and the results are beginning to flow.

A result with exciting potential is *Simplesse* all-natural fat substitute. In February 1990, this product was affirmed as "generally recognized as safe" (GRAS) by the U.S. Food and Drug Administration (FDA) for use in frozen desserts. And The NutraSweet Company has introduced the first product to be made with *Simplesse — Simple Pleasures* frozen dairy dessert. *Simplesse* may eventually be used in foods like mayonnaise, salad dressings and yogurt.

In December 1988, *Cytotec*, a drug that prevents gastric ulcers in certain high-risk patients, was approved for marketing by the FDA, which called it "the most important [drug] approved this year [1988]." U.S. sales of *Cytotec* reached $39 million in

1989, contributing to worldwide sales of $60 million. *Preventive* medications like *Cytotec* require more physician education than conventional *treatment* drugs. While the educational process takes longer, the effort should pay off in substantial sales increases in 1990 and beyond.

Maxaquin (lomefloxacin), a novel anti-infective drug in the quinolone class, had its first country launch in 1989. We expect approval in several other countries in the next two years.

In 1990, Searle will launch *Kerlone*, a once-a-day beta blocker for the treatment of hypertension.

In the Agricultural Company, we expect *Dimension* herbicide — a crabgrass treatment that really works — to be approved and on the market in 1990. And products in five new classes of chemistry are in early to late development stages in the Agricultural Company; one new product should emerge each year in these new classes of products.

The Chemical Company will continue to launch new high-performance products in 1990. If stain resistance was the carpet trend of the 1980s, durability will set the pace in the 1990s. The Chemical Company is already there with Traffic Control Fiber System, a new performance blend of nylon and acrylic carpet fibers for textured carpets, and with *Acrilan* Plus carpet fibers for fashionable "berber"-style, natural-look carpets.

The growing market for *Saflex* plastic interlayer in laminated architectural glass will be supported by the introduction of *Saflex OptiColor System* interlayer. This new product offers architects hundreds of new colors to enhance the beauty of their designs.

A number of new high-performance *Triax* plastic alloys are slated to come from the Chemical Company. Also coming are several specialties products, including the fifth generation of *Skydrol* fire-resistant hydraulic fluid. Unique, metallized textile materials for electromagnetic shielding for computers and other high-technology applications are also in the offing.

Fisher Controls will introduce new *PROVOX*plus products that will integrate business systems, facilitate system-wide planning and improve engineering productivity and environmental control tools. In 1990, Fisher also will market improved rotary valve seals and the new energy-efficient S.402 gas regulator for homes.

While Monsanto's pipeline is full, we can't help but be disappointed by delays in our efforts to bring bovine somatotropin (BST), a product that increases efficiency and improves milk production, to market. This product, which awaits FDA approval, is another in the continuing series of technology improvements for world agriculture. Opponents of new technologies have raised predictable charges against BST as disruptive to the supply-and-demand balance for milk. Nonetheless, upon its regulatory clearance, BST will join earlier technologies that have provided safe, high-quality food supplies at a low cost to consumers in developed agricultural sectors worldwide.

Looking back on 1989, we see solid performance from today's products and an impressive array of new, important products for future markets. In sum, the strategy is working.

But a financial strategy alone isn't enough for Monsanto to achieve its goals. No strategy can be stronger than the basic values of the company and its people.

The ability to deliver on our promises, to all our stake holders, rests squarely on a set of commitments and values that I believe increasingly characterize Monsanto and its employees. I won't dwell on them here, because we deal with them at length in the next few pages.

I'll simply note that as times and conditions change, so must strategies adapt to those changes. But our commitments and values will endure. And they will always be the bedrock upon which we construct the future strategies that will keep Monsanto prospering.

In April 1990, three of our directors will retire from the board, having reached mandatory retirement age. Raymond Dahl, Richard Fricke and John Hanley will be sorely missed in our corporate deliberations. Their collective contribution to our current results has been invaluable.

Jack Hanley, with 17 years of combined service as chairman, chief executive officer and board member, was instrumental in setting the current course of the corporation. A chronicle of his Monsanto years is on the inside back cover of this report.

In closing, I would like to note that while 1989 was a good year for a number of companies in the industries in which we participate, it was especially important to us as a demonstration of the *durability* of our earnings growth, and we expect to report 1990 as the fifth successive year of income gains.

Our people are delivering on commitments.

Richard J. Mahoney

Richard J. Mahoney
Chairman and Chief Executive Officer
March 5, 1990

Commitment to Greatness

"Money is not the single measure of a company or its managers. Financial performance is the 'enabler' to greatness. To be truly great, a company must merit that title from a varied group of stake holders: its employees, its customers and the communities in which it operates. Only by committing ourselves to both financial results and the highest social, ethical and moral standards — those nonfinancial commitments to greatness — can Monsanto achieve and maintain such a reputation."
— *Richard J. Mahoney,*
A Commitment to Greatness

A Commitment to Greatness was written and published in 1988 for Monsanto employees. It explores nine nonfinancial values that describe what Monsanto stands for, what it expects from its people and what people can expect from the company. They aren't nine easy steps to greatness. Nor are they exclusive to Monsanto. But together, they are what Monsanto must embrace if it is to earn the reputation for greatness from its stake holders.

In the following pages, employees, customers and neighbors describe how Monsanto is delivering on its commitments.

COMMITMENT TO SAFETY

"I meet with every new employee, and my basic message is always the same: Safety comes first," says Achiel Ossaer, manager of Monsanto's Antwerp, Belgium, plant.

Evidence of "Pak de 5," the name of the plant's safety program, can be seen everywhere — on clipboards, bulletin boards, hard hats. "Pak de 5" means "Take five": five seconds, five minutes, whatever time is needed to think through what you're about to do. And do it safely.

Ossaer says that attitude toward safety goes along with lower costs, improved quality and, ultimately, profits. He might have added employee ingenuity, as evidenced by the worker-designed mobile trolley for fire protection.

Up until last year, weekly safety checks far too often uncovered twisted fire hoses, missing branch pipes, wrong spare parts and damaged tools in the several fixed firefighting cabinets located throughout the plant.

It was virtually impossible to keep the equipment in the cabinets shipshape. Various pieces were often removed to be close at hand during any maintenance job that involved "hot work," like welding or spark-generating grinding. Though the condition of the equipment had not caused a problem, it was unacceptable given the plant's high standards.

"We knew we had a conflict," says Eddy De Belva, leader of the quality circle that solved the problem. "So, for standby protection during hot work, our team developed a completely equipped mobile trolley, ready to go anywhere."

Today the firefighting equipment inside the cabinets is neatly arrayed, easily accessible, ready for its primary job: to do battle with fires involving any of the potentially dangerous raw materials used in the plant.

As Ossaer says, safety and lower costs go together. The cost of maintaining the fixed fire cabinets dropped from $17,500 a year to around $1,000. The cost of four trolleys, fully equipped: $7,000.

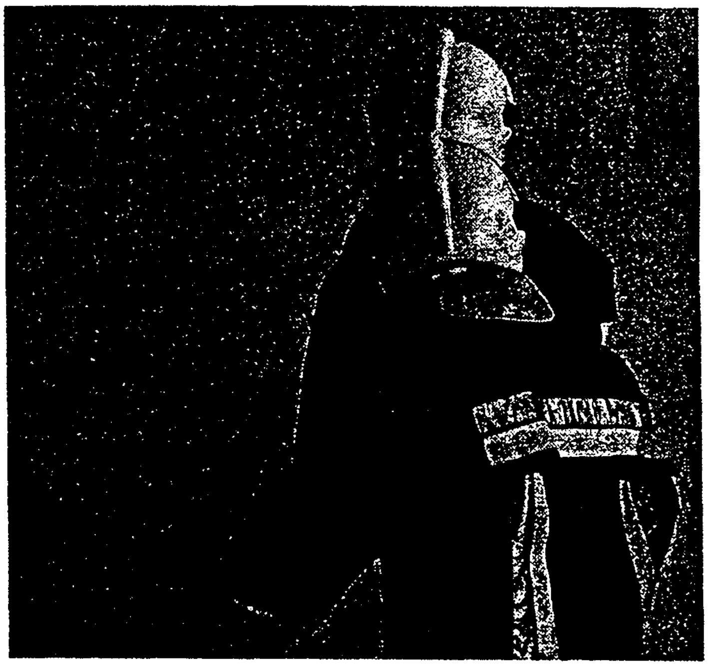
SAFETY DETAIL

DETAIL, a Monsanto training program on safety and environmental issues related to the proper handling of agricultural chemicals, is a winner with farm-chemical dealers and their customers and neighbors. The seven-part video series is an important educational resource in the farm community's drive to address concern for safe chemical handling and environmental protection.

In addition to offering valuable information to farm-chemical handlers and users, their employees and their farmer customers, the videos are shown to civic groups. "This helps the public evaluate the use of chemicals in agriculture," says Lloyd Burling of the Illinois Fertilizer and Chemical Association. "Local fire departments use the tapes to draw up emergency plans in case of spills or accidents."

In several states, including Iowa, New York, Oklahoma and Texas, people licensed to apply agricultural chemicals can receive continuing-education credits by attending DETAIL training sessions. Earning such credits is required for license renewal.

At the dealers' request, the next video series will include a comprehensive program for the farm family entitled "Farm Chemical Safety."



Through a relentless emphasis on safety, workers at the Antwerp, Belgium, plant have achieved one of the best safety records in Europe. Here, employee firefighters keep a blaze under control during a safety drill.

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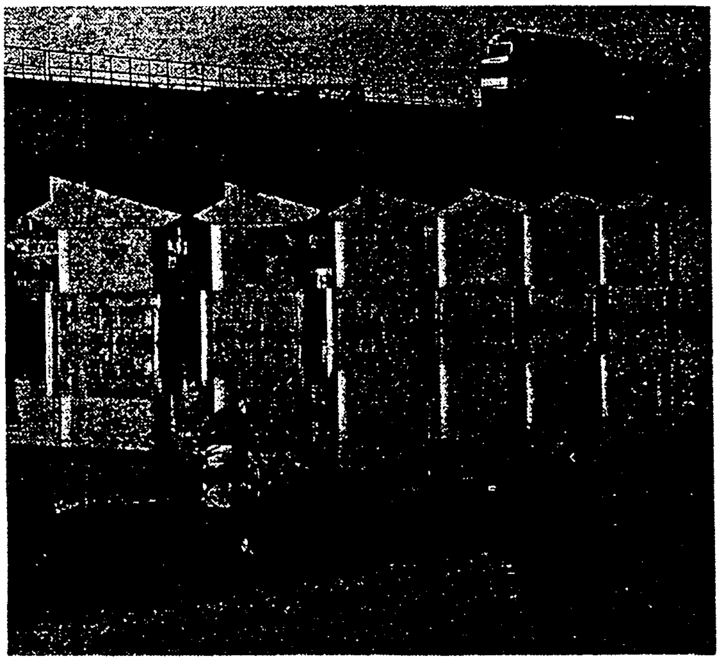
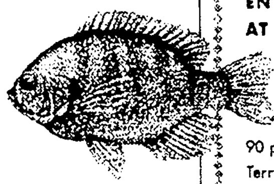
Emission reductions and open communications with neighbors continue to increase community recognition of Monsanto as a responsible corporate citizen in Everett, Massachusetts. Environmental Supervisor Greg DePagter tests water from the Mystic River as part of routine monitoring of the plant's treated discharges.



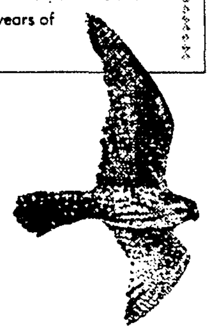


ENVIRONMENTALISTS AT WORK

When Monsanto announced in 1988 its industry-leading goal to reduce toxic air emissions 90 percent by the end of 1992, Terry Anderson, Bob Derrah, Steve Weichens and Russ Roeber were already working hard toward that goal.

In 1985, this team at Monsanto Agricultural Company's Muscatine, Iowa, plant began working on a machine that uses a new recycling technology to eliminate most of the air emissions created in a plastic-making process.

The new technology, expected to go on-line late this year, will achieve most of the 95 percent emission reduction planned for the unit. It will also pay for itself by saving more than $2.5 million in the first two years of operation.



COMMITMENT TO ENVIRONMENT AND NEIGHBORS

In 1986, Monsanto's chemical plant in Everett, Massachusetts, was in trouble with its neighbors in this Boston suburb. "When we polled them, one-third of the people considered us a health threat," recalls John Dushney, plant manager.

Pollution-abatement initiatives costing millions were already under way, but the community wanted more action and more information about what the plant was doing to clean up past problems. The plant was close to losing its neighbor-conferred right to operate. Clearly, everyone agreed, changes were needed.

John Ragucci, an Everett city councilor, recalls, "In 1986, Monsanto began a dialogue that today remains totally open and honest. They tell the community as much as they can as often as they can about their actions to improve the site. John Dushney and his staff are involved members of this community."

In the last several years, community support and acceptance of Monsanto have grown. Since 1988, for instance, Dushney has, by invitation, served on the board of The Boston Harbor Association (TBHA), the acknowledged "conscience of the Boston Harbor."

Dan Curll, president of TBHA, has words of praise for Monsanto's response to a community's need to see and understand changes at the plant. "What they've done exceeds all requirements," Curll says. "Monsanto is a corporate citizen that is as responsible as it can possibly be within technical and economic bounds."

He adds, "They have an honest worldview and a sincere long-term commitment that other industrial firms should emulate. Their investment will pay off."

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Commitment to Globalization

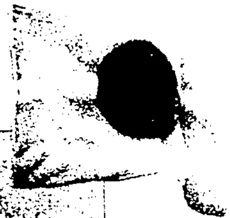
Back in the 1970s, when Monsanto patented and developed *Roundup* herbicide, the company recognized it had an astonishingly effective herbicide for an endless number of applications. And it saw this glyphosate-based product as one with truly global potential.

But merely packaging *Roundup* in five-gallon containers wouldn't satisfy the specific needs of vast numbers of customers. "We asked end-users what they wanted in addition to the results that glyphosate offers," says David Duncan, director of Monsanto Agricultural Company's greens business. "Responding to customer needs means going beyond chemicals. With *Expedite* delivery system, it meant developing an entire system of equipment and new formulations of glyphosate."

Customers' feedback from around the globe taught Monsanto much about tailoring products for local needs. To adapt glyphosate to meet the needs of specific users, Monsanto product development specialists have worked in every world agricultural situation — from French vineyards to develop *Azural* herbicide, to expansive Australian wheat fields to develop *Roundup* CT herbicide for moisture-conservation farming. They studied the weed control needs of Thailand to develop *Scout* herbicide, which they then packaged in liter containers for the convenience of small-plot farmers.

"Every formulation of glyphosate we sell is targeted to a specific need of farmers," says David Clifford, manager, glyphosates international, for Monsanto Agricultural Company. "Monsanto now has close to 100 brands of glyphosate-based products used in more than 100 countries."

No other group of products so well illustrates Monsanto's efforts to market globally by thinking locally.



BULLISH ON JAPAN

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[illegible] communications [illegible] securities com- [illegible] says George [illegible] of Monsanto Japan [illegible] thinking of doing [illegible] can now get informa- [illegible] third party in the [illegible] as customers, [illegible] partners and [illegible] United States. [illegible] the entire group of [illegible] this important [illegible]. As a [illegible] to develop new [illegible] relationships [illegible]

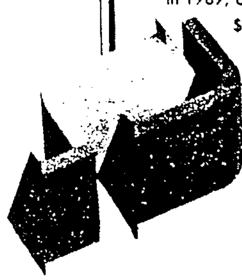
TRADE, COUNTERTRADE

Eastern Europe may be opening up, but without hard currency — that is, money readily accepted worldwide, like the French franc — people there can't buy our products. Or can they?

"There is a solution," says Dan West, director of countertrade for Monsanto. "We exchange our products for some of their products, which we then sell to someone who does have the hard currency. That's countertrade."

As an example, West cites Fisher valves recently sold in Romania. "We took ball bearings from Romania, sold the ball bearings in the United Kingdom and then converted the British pounds into U.S. dollars."

In 1989, countertrade contributed $200 million in sales to Monsanto.



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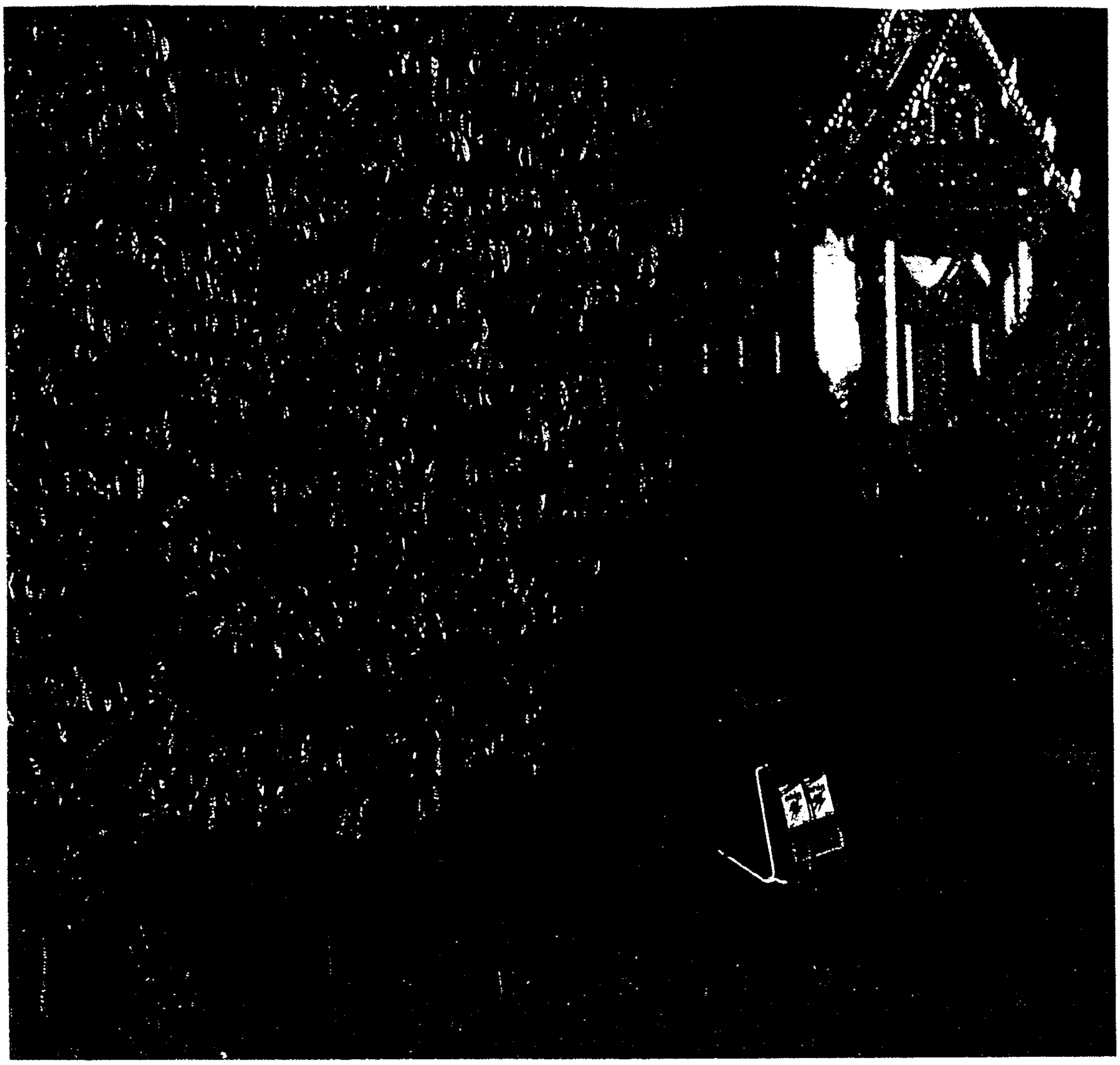


Monsanto's line of glyphosate-based products are tailored to solve unique local agricultural problems around the world. Spark *herbicide was developed for the needs of fruit growers and other small-plot farmers in Thailand.*

COMMITMENT TO RESULTS

Good science, good marketing and a determination to get results make a powerful combination for a pharmaceutical company like Searle.

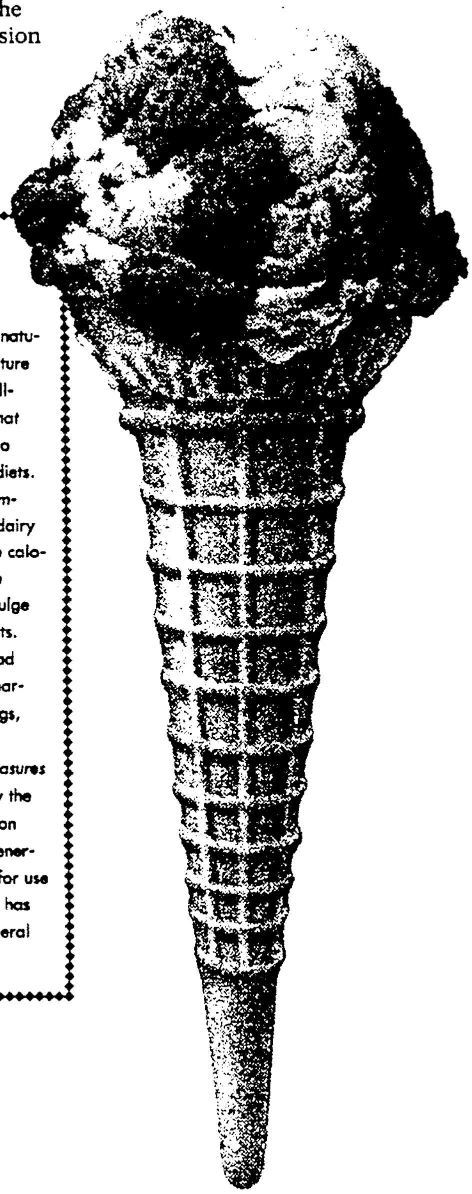
Searle applied that combination to *Cytotec* ulcer-preventive drug. *Cytotec*, originally developed for the treatment of ulcers, had become viewed by many as just another me-too acid suppressant.

But after extensive new clinical studies, Searle was able to reposition *Cytotec* as the first and only medicine that can prevent stomach ulcers caused by chronic use of arthritis medications in high-risk patients.

This drive for results was also behind the repositioning of Searle's high-blood-pressure medicine, *Calan* SR. After years of use for the treatment of angina, *Calan* was reformulated as a slow-release, once-a-day medication for the much larger high-blood-pressure market.

After this reformulation and repositioning in 1986, *Calan* SR quickly became a leader in the highly competitive hypertension market. In 1989, U.S. sales exceeded $364 million, and the *Calan* brand became the 12th most widely sold prescription product in the United States.

Searle's total sales in 1989 passed the billion-dollar mark. The company also showed an operating profit for the first time since being acquired by Monsanto in 1985. Searle people are getting results.



GOOD TASTE,
GOOD HEALTH

Imagine a fat substitute that is all natural, yet provides the taste and texture of fat in foods. That's *Simplesse* all-natural fat substitute, a product that should appeal to people seeking to reduce the amount of fat in their diets.

The first product made with *Simplesse* is *Simple Pleasures* frozen dairy dessert. Fat-free and with half the calories of premium ice cream, *Simple Pleasures* allows consumers to indulge their taste for rich, creamy desserts. *Simplesse* has potential for a broad range of foods — mayonnaise, margarine, sour cream, salad dressings, cheese and many more.

The introduction of *Simple Pleasures* followed the recent affirmation by the U.S. Food and Drug Administration that *Simplesse* fat substitute is "generally recognized as safe" (GRAS) for use in frozen desserts. *Simplesse* also has been cleared for marketing in several other countries.

A LICENSE TO SUCCESS

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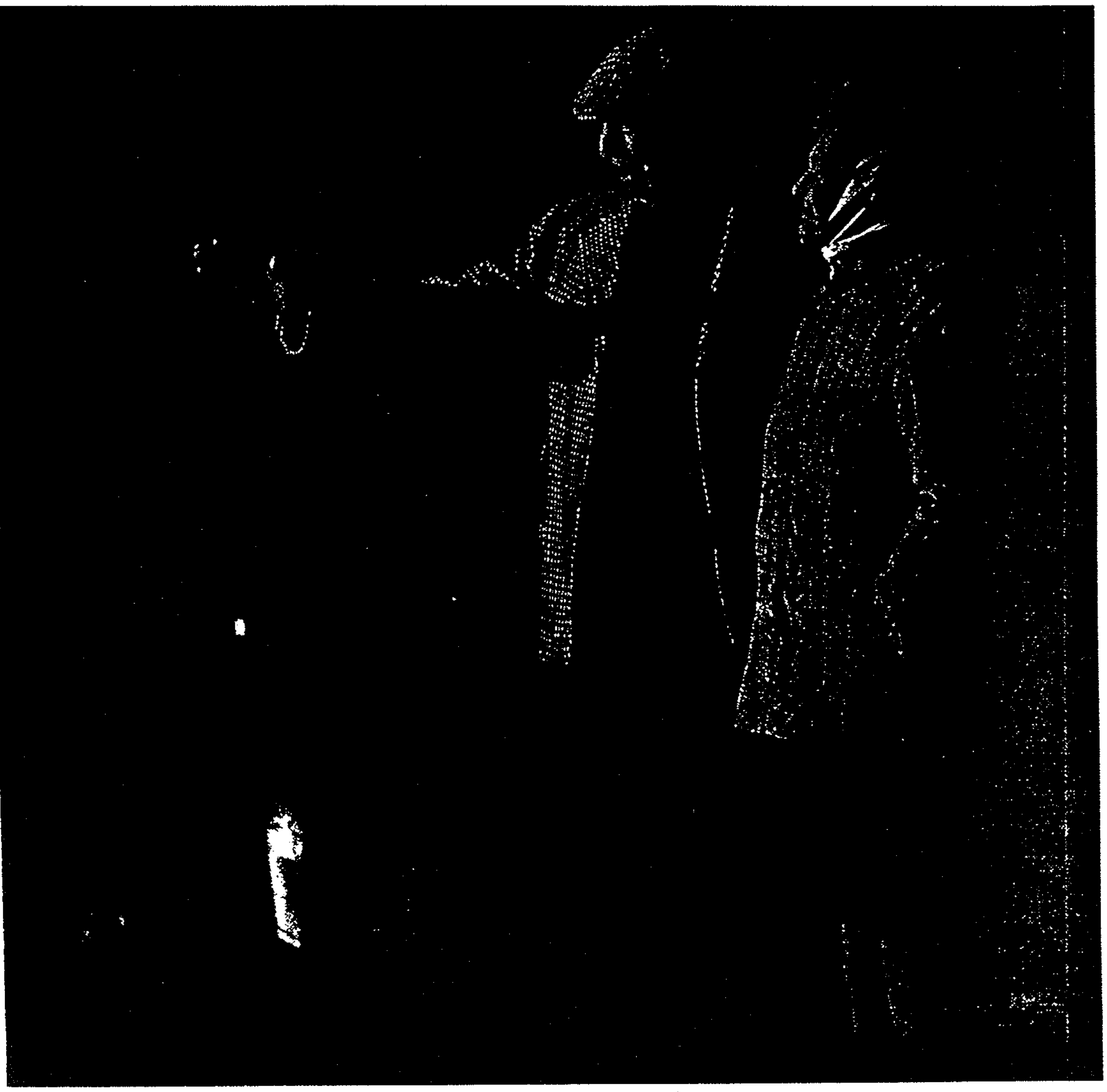
Searle's drive for results helps people like Gladys and Gwillem Hughes, here strolling in a park near their suburban London home, lead healthier and more active lives. For example, by developing Cytotec *as the only drug that can prevent gastric ulcers often caused by arthritis pain medications, Searle removes a significant concern of these patients.*



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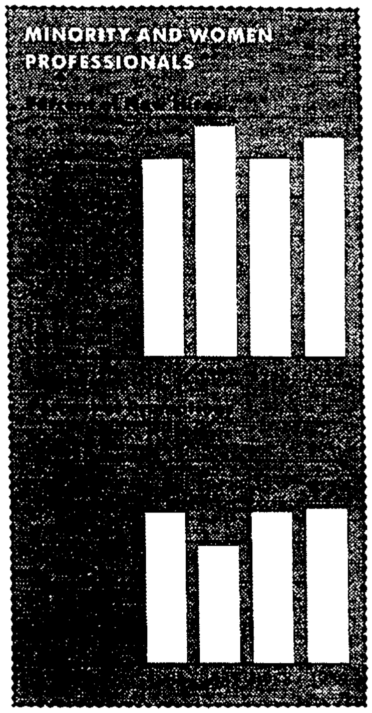
Monsanto encourages minority high school students like Vicki Tibbs to enter science and math careers through its Horizon internship program. Tibbs spent 10 weeks at Monsanto's Environmental Health Lab, some of it working with Dr. William Ribelin in the pathology group.



COMMITMENT TO EQUAL OPPORTUNITY

"You have to be taught
To be afraid
Of people whose skin
Is a different shade."
So goes the song from the musical *South Pacific.*

Once the lessons are taught, the unlearning does not come easy. But it is being done. For instance, Monsanto Chemical Company offers seminars on "Managing a Diverse Work Force" — two days of soul-searching and stereotype-debunking exercises. Through these seminars, more than 2,500 employees have become more sensitive to issues of race, sex, age and culture.

As a supplement to these seminars, the Chemical Company conducts 14-day, intensive workshops on the ebb and flow of relationships. Graduates become "inside consultants" available to anyone having a problem with a co-worker, subordinate or boss.

For any given situation, two consultants are paired together as a team ("consulting pair"), often reflecting the racial or gender makeup of the individuals involved. "Consulting pairs don't give the answer," says Steve Williamson of the Rubber and Process Chemicals Division. "We just get the employees to agree to take steps to address their issues."

To get work relationships off to a good start, new employees go through a "joining up" process in which they, their supervisor and a pair of facilitators from the consulting-pairs program meet and talk. They deal immediately with biases that otherwise might not surface for months, if at all.

Bill Royal, of the finance and planning group, has assisted at more than two dozen "join-ups." Royal says, "Some managers come in thinking, 'Boy, is this a waste of time!' But soon they start talking about what it takes to succeed, about socializing so people do not feel excluded, about seeing their employee as someone who may bring special perspectives."

COMMITMENT TO EMPOWERMENT

"We first came here to work because we were good with our hands. But our empowerment program shows that our heads and hearts will make the difference if our plant is to compete in the 1990s," states Rao Sanampudi, manufacturing engineer and facilitator for the eight-member High-Involvement Work Team at the Fisher Controls plant in McKinney, Texas.

The team's first project was to produce a redesigned service regulator that maintains a constant downstream pressure of natural gas to homes.

The story started when an informal group of managers and design draftsmen, who named themselves "The Skunkworks," decided to replace the 30-year-old S.102 regulator, which had been copied by many competitors. Both salespeople and customers were asked to provide a wish list of features for the "perfect" regulator. The Skunkworks then began to design a prototype of the S.402, a new and improved regulator.

"Developing the design based upon customers' requirements gave the customers satisfaction and us a surprising degree of success -- and new patents have been and are about to be issued," says Don Rice, engineering manager.

The High-Involvement Work Team then took over to guide the new regulator through production. Team members, who previously had worked only single-skill jobs, had to learn every aspect of production. They even redesigned a production line.

"We used to feel like robots. Now we've specified the use of robots to manufacture this product," says team member Maxine Travis. "We learned to do everything required to produce this new product. People all over the plant want to be on a team now."

Success begets success. The McKinney plant manufactures hundreds of types of products, dozens of which are now benefiting from the heads and hearts, as well as hands, of its empowered employees.

HARMONIZING IN WALES

At the Newport plant in South Wales, empowerment was the next logical step in a process begun in 1982 when hourly workers moved to an "annual hours" contract and the time clocks were thrown away. In 1988, "harmonization" gave everyone at Newport an individual staff contract with salary ranges, goals, broader responsibilities and a greater knowledge of the company's aims.

Ian Gadd, a maintenance fitter for 10 years at Newport, has seen the plant culture "go from a hierarchy to a community" in the last two years. Gadd says, "Life is easier and more interesting since we became one staff. Jobs get done quicker, and I'm free to delve into all aspects of my responsibilities."

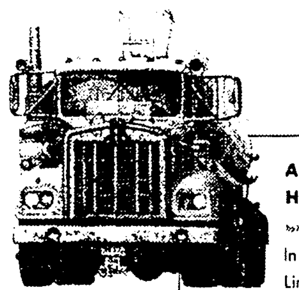
Working with customers, the sales force and technical experts, an eight-member team of empowered workers at the Fisher Controls plant in McKinney, Texas, made the industry's most advanced house service regulator a reality. Shown with manufacturing engineer Rao Sanampudi are Isabel Benitez (left) and Anita Lemmond (right) of the High-Involvement Work Team.

ADOPT-A-SCIENTIST

Last summer, Sheila Schuette, an agricultural scientist for Monsanto Agricultural Company, spent three days at Marvin and Reta Glick's Indiana hybrid-corn farm. Schuette visited as a participant in the American Farm Bureau's "Adopt-a-Scientist" program, through which scientists live with farmers to learn firsthand their practical needs. Researchers can then develop more effective solutions to agricultural problems.

"I never realized how aware farmers are of such things as groundwater contamination and pesticide container disposal," Schuette says. "The importance to farmers of innovations like our mini-bulk refillables for *Lariat* herbicide was quite apparent.

"The experience was irreplaceable."



A CUSTOMER'S HOLIDAY

In July 1989, Polysar Limited in Ontario urgently needed an extra 80 barrels of *Therminol 59* heat-transfer fluid to start up a new $100 million plant. Although it was a holiday weekend in both the United States and Canada, Jean Dussault of Monsanto Canada spent hours making dozens of phone calls to arrange immediate shipment from the Anniston, Alabama, plant.

"We stood to lose $200,000 a day," recalls a grateful Howard Whitton, Polysar's purchasing agent. "Monsanto's people in Canada and Alabama never stopped trying, and they accomplished the impossible. They set up a weekend delivery and saved us five days of production."

COMMITMENT TO SERVING CUSTOMERS

"When you begin formulating products as a direct response to customers' requests, they quickly learn to ask for 'dream products.' Then it's our job to supply them," says John Kilkenny, director of new business development for Monsanto Chemical Company's Plastics Division.

An increased focus on serving customers was basic to restructuring the Chemical Company away from commodities and toward performance materials — products that sell because of the value they add to customers' products.

Two new products for the automotive industry, for instance, satisfy specific customer needs: *Lustran* Elite HH, a high-heat plastic, and *Lustran* Elite LGA, a low-gloss plastic for interior trim.

The list of such responses to customers' needs since 1986 includes more than 60 new and improved products. The number will grow by more than 15 per year into the 1990s.

Exemplifying the attitude toward serving customers is Bill Cloutier, marketing technical service principal for *Saflex* plastic interlayer at the Indian Orchard Plant in Massachusetts. "If I'm at a windshield plant, I consider myself their employee," Cloutier says. "I get a lot of satisfaction from my relationships with my customers."

Satisfaction works both ways. Tom Russell, supply manager at Ford Motor Company's Dearborn, Michigan, windshield plant, loves to see Cloutier walk in the door. "He's so knowledgeable, he anticipates needs we don't even know we have," says Russell.

These kinds of alliances are good business for both customers and Monsanto. They also put Monsanto's global reach as near as a handshake.

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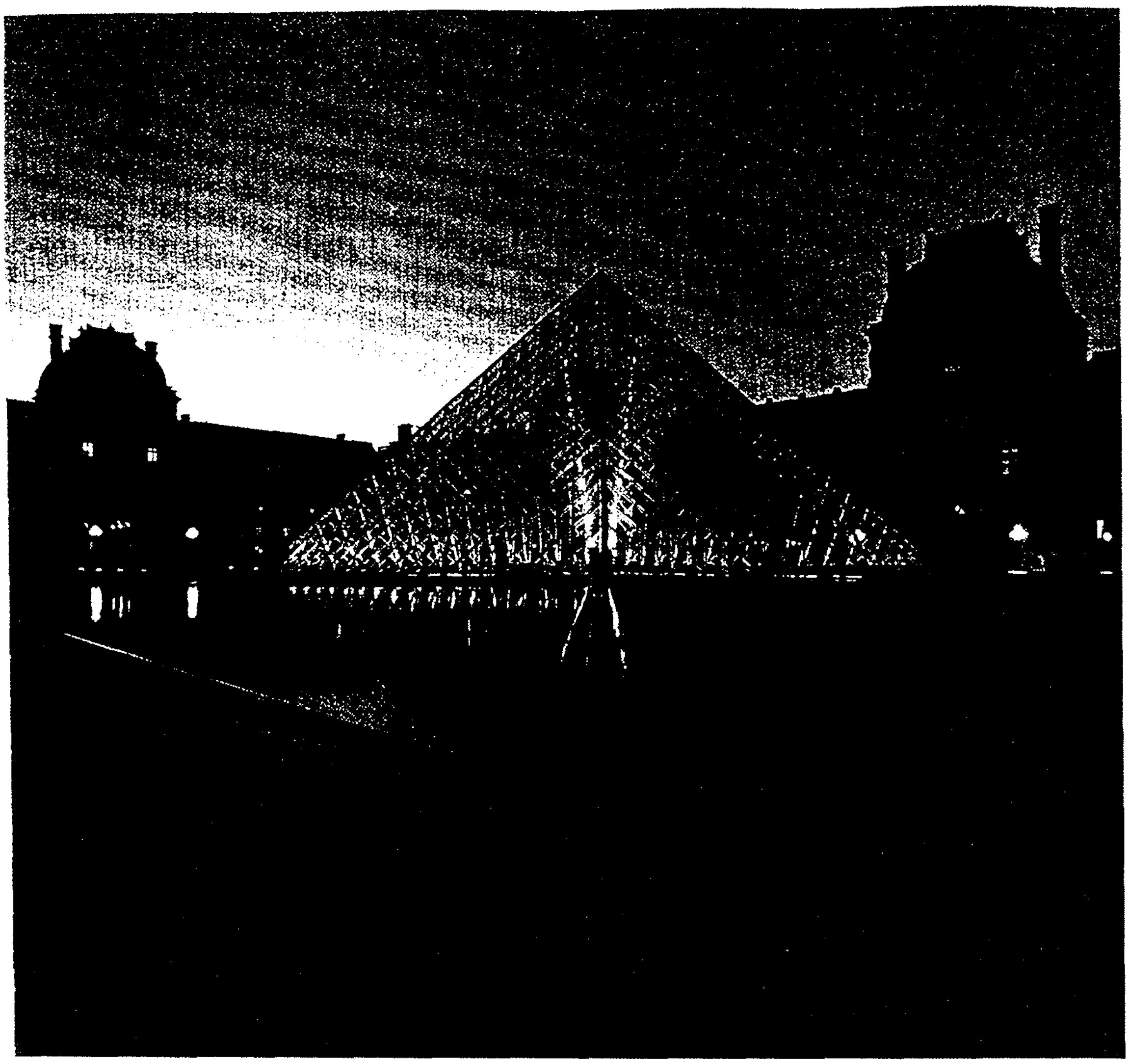

Serving customers through new products or new uses of existing products is exemplified in the growing number of applications for Saflex *plastic interlayer. The world's leading product for making automobile glass shatter-resistant,* Saflex *is increasingly used in architectural glass, in works of art, and in designs such as I.M. Pei's glass pyramids at the entrance to the Louvre in Paris.*

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Commitment to Doing the Right Thing

In Maury County, Tennessee, dignity and stability are synonymous with the local community's strong work ethic. Monsanto's 50 years of mining and processing phosphorus at the Columbia plant provided three generations with good work.

In 1985, however, as the body of ore neared exhaustion and demand for phosphates continued to soften, Monsanto announced that the plant would close a year later. The immediate result was an uncertainty that threatened the quality of life in this lush, rolling hill country in middle Tennessee, where family and jobs are the two central priorities.

"Monsanto's closure announcement was like hearing an old friend say goodbye," remembers Bill Chaffin, president of the Columbia Chamber of Commerce. "They could have just pulled up stakes, but they went out with as much class and concern for Columbia as they had operated with for 50 years."

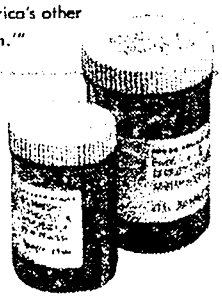
The story of furnace operator Jimmy Massey typifies what the work force of 414 people experienced during the shutdown. "The company did everything it could possibly do to help us all find work," Massey recalls. "They opened up what we called the 'unemployment office,' and brought a firm in from Atlanta to teach us how to write résumés and handle ourselves in interviews. They invited other companies from hereabouts and from other states to come to the plant to do interviews."

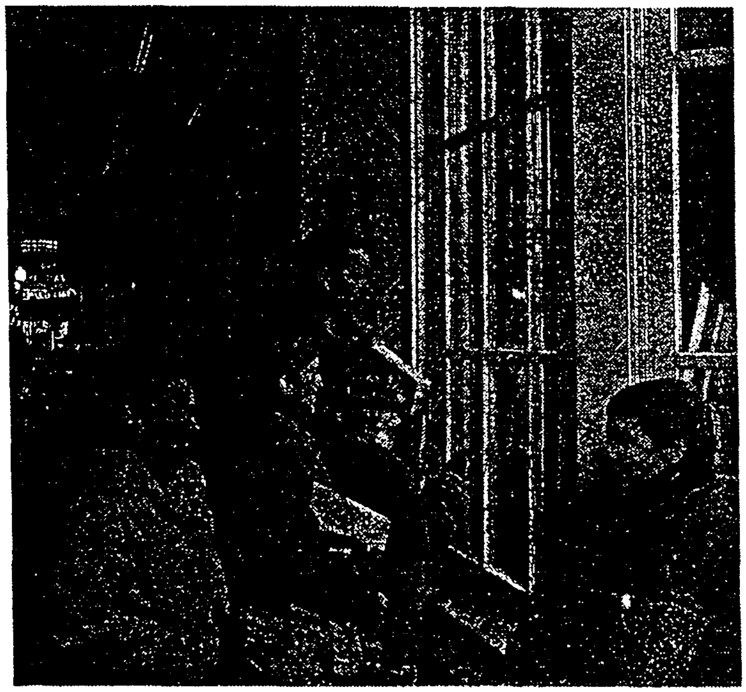
Massey continues, "Monsanto is family. I know that sounds corny, but you ask anybody. All of us got help from Monsanto, and we got jobs we wanted. We're all fine, but we wish Monsanto would somehow return."

PATIENTS IN THE KNOW

Patients have always wanted more information on their illnesses and medications than is often routinely provided by their physicians. Searle's *Patients in the Know* program provides patients with valuable information about their medicine in language they can read and understand.

Acclaim for the program has been universal. As Senator Orrin Hatch of Utah noted the day the program was announced, "This initiative by Searle provides important information to millions of Americans. It is a simple but vitally important step in making progress toward solving what has been termed 'America's other drug problem.'"





After closing its Columbia, Tennessee, plant, Monsanto brought in counselors and recruiters to ensure that employees like Jimmy Massey, shown here with his wife and children in downtown Columbia, could find new jobs with minimal disruption to their personal lives.

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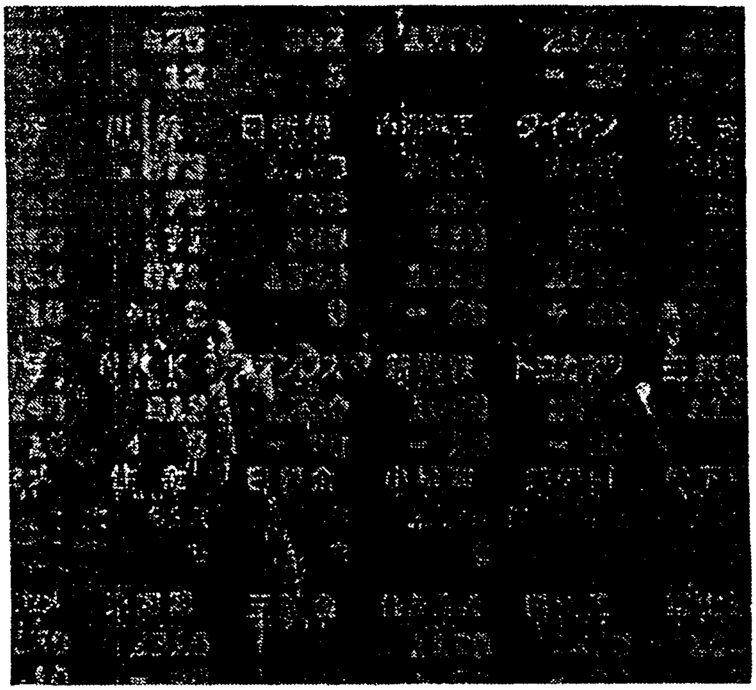
Monsanto's listing on the Tokyo Stock Exchange last October enhanced the company's visibility in Japan, not only with the financial community but also with customers, suppliers and other business partners.



BREAKING THE CYCLE

Monsanto has reduced its reliance on highly cyclical markets. Five years ago, those markets accounted for two-thirds of the company's sales, but today they are less than one-third. To maintain this recession-resistant posture, company strategy will continue to focus on high-value-added products — products whose prices and profit margins are determined more by value created for customers than by raw-material costs or near-term supply-and-demand factors.

"When you add value, as we do to nylon carpet fiber by making it stain-resistant, you are aiming at the upper end of the market, which buys not on price but because of the special need the product fills," says Monsanto Chief Economist Nicholas Filippello.

"Similarly, the tire-replacement market that uses our rubber chemicals and the windshield-replacement market that uses *Saflex* plastic interlayer should support sales even if car production slows. Altogether, this should mean a solid and less volatile earnings base."

COMMITMENT TO SERVING SHAREOWNERS

Monsanto must serve the dual needs of its shareowners. On the one hand, the company must provide consistent near-term returns; on the other, steady long-term growth.

Near-term, shareowners look for continual gains in earnings and dividends from industry leaders, says Monsanto Chief Economist Nicholas Filippello. "We concentrate on high-value-added products that are or can be market leaders," he notes. "We support those leadership positions through R&D, licensing and acquisitions."

The result of that focus is a strong earnings base and substantial cash flow that permit Monsanto to grow its current businesses, to invest in the development of future products, and to pay steadily increasing dividends to shareowners. Monsanto has accomplished all of that while significantly reducing the debt incurred as a result of the acquisition of Searle in 1985. Monsanto's increase in dividend payments has continued during each of the past 17 years.

"Our current leadership positions should carry us while we focus on product innovation, whether to bolster mature businesses or to break new frontiers in biochemistry and nutrition," Filippello explains.

Long-term, therefore, new products top Monsanto's strategic focus. Abandoning its policy in the early 1980s of devoting about 3 percent of sales revenue to research and development, Monsanto has now more than doubled that investment, to about 7 percent of sales today.

Recently developed products include *Kerlone* antihypertensive drug, *Acrilan* Plus carpet fibers, *Simplesse* all-natural fat substitute and *Dimension* herbicide, with more to come. These products promise continued contributions to shareowner value.

As Filippello notes, "Companies that can consistently return 20 percent on shareowners' equity enjoy superior market values." With a 17.6 percent return on equity in 1989 (up from 15.4 percent in 1988 and 11.4 percent in 1987) and with an eye on the 20 percent goal, Monsanto has its sights firmly on serving the dual needs of shareowners.

The Values of a Winner

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

Values — whether for an individual or a corporation — are guideposts on the road to achievement. A great company must produce sustainable financial returns, but that cannot be its only objective. It's unlikely that any company can succeed *over time* without clearly stated and agreed-upon values that reflect firm commitments to those who have a stake in its actions.

We have such values at Monsanto, and they directly affect our way of life. They underlay the steady growth in our sales and income for the past several years, including our record financial performances in 1988 and 1989.

Our values are basic. *Doing the right thing* is the foundation of our entire philosophy. We tell our people, "If you are ever in doubt, do what's right."

We have other important signposts as well. Nothing can come before the *safety* of our workers, or the *protection of the environment and our neighbors*, whether near or distant. If we don't *deliver for our shareowners* as they believe we should, they'll find better things to do with their money.

As the world changes, other values take on added importance because markets are rapidly becoming more and more global. Today's customers have unprecedented options; more than ever before, they can go elsewhere. World-class quality no longer represents the margin of victory — it's merely the entry fee to play the game. Thus, *becoming more global* in our thinking is urgent. *Focusing on customers' needs*, by providing new products and unequaled service, is essential.

What can be more important than tapping the full talents of everyone in this company? That means *empowering* them to do their jobs, and giving each *a real opportunity* to succeed.

And, like doing the right thing, a *drive for results* must reside at the core of every endeavor we undertake.

These are the central values of our company, and we strive to live by them every day. We believe they are the values of a winner.

Financial Section Contents

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.

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 controls as of December 31, 1989, 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 23, 1990

Audit Committee Report

The Audit Committee is composed of five non-employee members of the Board of Directors and met four times in 1989. It reviews and monitors Monsanto's internal 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 1989 Annual Meeting, Deloitte & Touche (formerly Deloitte Haskins & Sells) was 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 23, 1990

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, 1989 and 1988, and the related statements of consolidated income, shareowners' equity and cash flow for each of the three years in the period ended December 31, 1989. 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, 1989 and 1988, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 1989, in conformity with generally accepted accounting principles.

Deloitte & Touche

Deloitte & Touche
Saint Louis, Missouri

February 23, 1990

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Statement of Consolidated Income

(Dollars in millions, except per share)	**1989**	1988	1987
Net Sales	**$8,681**	$8,293	$7,639
Cost of goods sold	**5,035**	4,972	4,755
Gross Profit	**3,646**	3,321	2,884
Marketing expenses	**1,154**	1,013	918
Administrative expenses	**516**	474	424
Technological expenses	**672**	648	615
Amortization of intangible assets	**226**	231	225
Restructuring expense (income) – net			(32)
Operating Income	**1,078**	955	734
Interest expense	**(182)**	(174)	(172)
Interest income	**57**	46	42
Other income — net	**62**	66	69
Income Before Income Taxes	**1,015**	893	673
Income taxes	**336**	302	237
Net Income	**$ 679**	$ 591	$ 436
Earnings per Share	**$10.03**	$ 8.27	$ 5.63

The above statement should be read in conjunction with pages 39 through 44 of this report.

Key Financial Statistics	**1989**	1988	1987
Percent Change from Prior Year:			
Net Sales	**5%**	9%	11%
Operating Income	**13**	30	16
Net Income	**15**	36	1
Earnings per Share	**21**	47	1
As a Percent of Net Sales:			
Gross Profit	**42**	40	38
Marketing, Administrative and Technological Expenses	**27**	26	26
Research and Development Expenses	**7**	7	7
Operating Income	**12**	12	10
Net Income	**8**	7	6
Effective Income Tax Rate	**33**	34	35
Return on Shareowners' Equity	**17.6**	15.4	11.4

1989 – Another Record Year

Monsanto continues to deliver on its commitments as evidenced by the second consecutive year of record sales and earnings — and the fourth consecutive year of improved financial performance. This exceptional performance resulted from a combination of reasonably active markets and successful commercial strategies that increased sales volume. Earnings also benefited from the success of Monsanto's strategy to concentrate on higher value-added products. In addition to strong income performance, the stock purchase program contributed to the improvement in earnings per share and return on shareowners' equity (ROE).

Sales Demand Was Strong Across Most Businesses

Net sales increased 5 percent in 1989, principally from higher sales volume (up 9 percent for retained businesses), as demand was strong across most business and geographic markets. *Roundup* herbicide contributed significantly to volume growth (up 25 percent worldwide) in 1989. Reductions in selling price on most glyphosate products and new formulations continued to make the herbicide cost-effective for weed control for a broad range of crop, industrial and residential uses. Sales of the *Calan* calcium channel blocker products for hypertension grew approximately 50 percent due to the unique once-a-day dosage of *Calan* SR. 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, sales grew 14 percent on continuing operations. Markets outside the United States continued to be significant and contributed 41 percent of Monsanto's 1989 net sales. In comparing year-to-year results, Monsanto's 1988 net sales included $391 million of sales revenue associated with subsequently divested businesses.

Overall selling price increases generated $29 million in additional sales revenue, in spite of the $131 million adverse effect of translation of non-U.S. dollar denominated sales into a generally stronger U.S. dollar. Chemicals, Fisher Controls and Pharmaceuticals selling prices increased, while glyphosate-based herbicides, *NutraSweet* brand sweetener and *Alimet* animal feed supplement prices declined. The global pricing strategy for glyphosate herbicides lowered average selling prices 7 percent, but revenue from the additional sales volume exceeded the pricing loss. Average selling price for *NutraSweet* brand sweetener declined 3 percent due to a combination of price declines and sales mix.

Quality of Product Portfolio Enhanced Operating Income

Operating income in 1989 was a record $1,078 million, and 13 percent higher than the prior year. The operating profit margin was 12 percent of net sales, and operating income improved for the fourth consecutive year. Sales volume and mix was the principal factor for the higher operating income. Higher selling prices and lower raw material costs also contributed to a lesser extent. Monsanto's sales mix was favorable because a larger portion of sales came from higher-margin products (Crop Chemicals, NutraSweet and Pharmaceuticals). Searle achieved a milestone by earning an operating profit in 1989 for the first time since the Pharmaceuticals unit was acquired by Monsanto in 1985. Fisher Controls operating income in 1989 was more than double its 1988 income. Crop Chemicals, Chemicals and NutraSweet had record operating income from continuing businesses, but Animal Sciences operating loss was greater than the prior year.

Marketing expenses increased 14 percent and were 13 percent of net sales in 1989 versus 12 percent the prior year. An increase in sales through commission agents, higher promotional expenditures, and costs associated with product introductions were the principal reasons for the change.

Administrative expenses in 1989 increased 9 percent due principally to the cost of various employee incentive programs and, to a lesser extent, inflation.

Research Expenditures Remained Significant

Research expenditures of 7 percent of net sales demonstrate Monsanto's strong 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 segments. University collaboration and opportunities for licensing remain an integral part of Monsanto's overall research program.

Other income was down slightly in 1989. Significantly higher gains in 1989 from divestitures of various businesses were more than offset by higher currency losses and lower miscellaneous income. The principal 1989 divestiture gain resulted from the sale of the analgesics business — $56 million pre-tax ($36 million, or $0.53 per share after-tax). The impact of nonrecurring items in 1989 was about the same as the total of a number of small, nonrecurring items in the prior year.

ROE Improved

Progress continued toward achieving management's target of a 20 percent ROE by the early 1990s. On the strength of higher profitability and aided by the stock purchase program, ROE for 1989 improved to 17.6 percent (16.6 percent excluding the analgesics divestiture gain), versus 15.4 percent in 1988.

Earnings Potential Emerged in 1988

The continued success of strategies established in prior years and growth in key worldwide markets produced strong sales demand that translated into profit improvements for Monsanto in 1988. The increased sales demand was experienced across all operating units. Markets outside the United States accounted for 43 percent of net sales and contributed heavily to the improved sales performance. New applications and market expansion contributed to robust demand for established agricultural products such as *Roundup* and *Lasso* herbicides. *Alimet* animal feed supplement had a record sales year, with a substantial increase in volume. Products such as *Saflex* plastic interlayer and *Lustran* ABS thermoplastics experienced vigorous demand, and sales of stain-resistant carpet fiber for *Wear-Dated* carpet continued to grow. The volume growth of *NutraSweet* brand sweetener reflected the continued strength of the U.S. diet carbonated soft drink market and further penetration of international markets. Sales of the *Calan* pharmaceutical products increased 79 percent.

Strong demand supported selling price increases for a number of products in 1988, and overall selling prices were favorable despite the reductions in some glyphosate herbicide selling prices. The continued weakness of the U.S. dollar in 1988 gave U.S.-produced goods a competitive advantage in certain world area markets, and the translation of sales denominated in other currencies into the U.S. dollar was also favorable.

Monsanto's strategy to exit from cyclical commodity chemicals businesses in favor of higher value-added products improved the quality of the product portfolio and resulted in a significant improvement in operating income. Additionally, higher selling prices exceeded raw material cost increases.

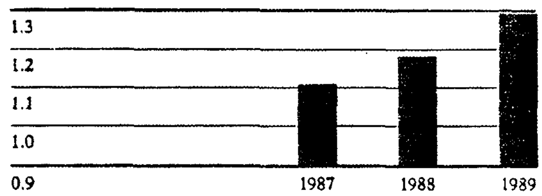
Marketing and administrative expenses increased in 1988 primarily because of inflation, higher sales agents commissions from the higher sales volumes, and greater employee incentive compensation associated with improved earnings.

The higher profit performance, supplemented by the stock purchase program, produced a 15.4 percent ROE. This was a considerable improvement over the 11.4 percent ROE attained in 1987.

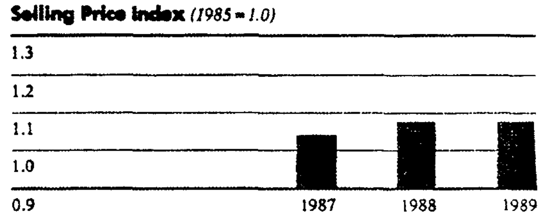
Analysis of Change in Earnings per Share — Better (Worse)

	1989 vs. 1988	1988 vs. 1987
Sales-Related Factors:		
Selling prices	$ 0.26	$ 1.78
Sales volume and mix	3.94	2.47
Total Sales-Related Factors	4.20	4.25
Cost-Related Factors:		
Raw material costs	0.18	(1.02)
Other manufacturing costs	(0.70)	0.19
Marketing, administrative and technological expenses	(2.18)	(1.30)
Total Cost-Related Factors	(2.70)	(2.13)
Other Factors:		
Restructuring — net		(0.24)
Divestitures	(0.41)	(0.26)
Total Other Factors	(0.41)	(0.50)
Operating Income	1.09	1.62
Interest expense	(0.08)	(0.01)
Interest income	0.10	0.03
Other income — net	(0.04)	(0.02)
Change in income taxes	0.16	0.38
Change in shares outstanding	0.53	0.64
Change in Earnings per Share	$ 1.76	$ 2.64

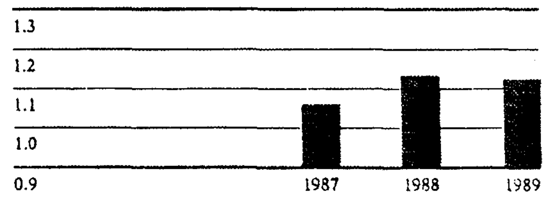
Sales Volume Index *(1985 = 1.0)*



Selling Price Index *(1985 = 1.0)*



Raw Material Cost Index *(1985 = 1.0)*



Operating Unit Segment Data

	Net Sales			Operating Income (Loss)			Research and Development		
	1989	1988	1987	**1989**	1988	1987	**1989**	1988	1987
Agricultural Products:									
Crop Chemicals	**$1,558**	$1,377	$1,178	**$ 474**	$434	$359	**$119**	$110	$ 94
Animal Sciences	**159**	169	127	**(42)**	(10)	(43)	**43**	43	47
Chemicals	**4,065**	3,989	3,858	**497**	486	450	**104**	108	108
Electronic Materials		209	185		11	(5)		6	8
Fisher Controls	**852**	840	749	**64**	29	26	**17**	19	18
NutraSweet	**869**	736	722	**180**	154	145	**39**	35	31
Pharmaceuticals	**1,178**	973	820	**6**	(62)	(119)	**218**	198	199
Biotechnology Product Discovery				**(47)**	(47)	(43)	**47**	47	43
Corporate				**(54)**	(40)	(36)	**11**	9	9
Total	**$8,681**	$8,293	$7,639	**$1,078**	$955	$734	**$598**	$575	$557

	Total Assets			Capital Expenditures			Depreciation and Amortization		
	1989	1988	1987	**1989**	1988	1987	**1989**	1988	1987
Agricultural Products:									
Crop Chemicals	**$1,173**	$1,001	$ 918	**$109**	$101	$ 71	**$ 81**	$ 85	$ 82
Animal Sciences	**316**	260	221	**39**	22	21	**25**	25	22
Chemicals	**2,993**	2,883	2,856	**300**	329	287	**247**	235	231
Electronic Materials		217	234		10	11		20	17
Fisher Controls	**634**	682	654	**29**	25	22	**31**	37	34
NutraSweet	**1,344**	1,484	1,724	**49**	36	31	**215**	209	206
Pharmaceuticals	**1,814**	1,604	1,484	**71**	56	50	**79**	79	75
Biotechnology Product Discovery	**54**	67	78	**6**	7	6	**10**	11	8
Corporate	**276**	263	286	**4**	4	6	**2**	2	4
Total	**$8,604**	$8,461	$8,455	**$607**	$590	$505	**$690**	$703	$679

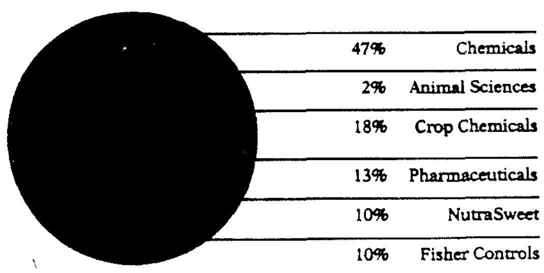
The above data should be read in conjunction with the Segment Information note to the financial statements on page 44.

The countries in which Monsanto operates have experienced varying degrees of inflation; therefore, the historical cost of certain assets is generally lower than current cost. Generally accepted accounting principles require financial statements to be prepared at historical cost. Consequently, the depreciation and amortization expense reported above is less than that which would be reported using current cost.

The 1988 operating results of the Electronic Materials business, which was sold in March 1989, included the 10 months ended October 31. 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' strong performance in 1989 and 1988, along with the factors that are expected to affect operating results in 1990, are described on the following pages.

1989 Net Sales
(percent by operating unit)

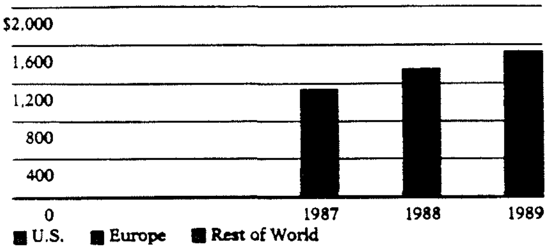


Crop Chemicals

	1989	1988	1987
Net Sales	**$1,558**	$1,377	$1,178
Operating Income	**474**	434	359

The Crop Chemicals operating unit is a leading worldwide producer and marketer of herbicides, including *Roundup, Lasso, Far-Go, Avadex* and *Machete.* Regional weather conditions in the agricultural markets throughout the world affect Crop Chemicals sales volume, and more than half of Crop Chemicals net sales are to markets outside the United States.

Crop Chemicals Net Sales
(dollars in millions)



Crop Chemicals herbicide sales were strong in most key markets in 1989, with net sales increasing 13 percent and operating income growing 9 percent. Sales volume of *Roundup* and other glyphosate herbicides was up 25 percent in 1989 despite dry weather in northern Europe. This excellent 1989 performance is the fourth consecutive year of volume growth of 25 percent or more. Selling price reductions have made glyphosate herbicides more cost effective to use, and the consequent sales volume increase more than compensated for the lower prices. The expansion of existing markets and the entrance into new markets were factors in setting a record sales volume for *Roundup* herbicide. Sales volume for *Lasso* herbicide was strong because of increased plantings of corn and soybeans in the United States despite continuing dry conditions in several sectors of the corn belt.

In 1988, Crop Chemicals net sales increased 17 percent, and operating income improved 21 percent. Selling price reductions for glyphosate herbicides facilitated expansion into new markets, while an increase in the planted acreage of corn and soybean crops in the United States contributed to higher net sales of *Lasso* herbicide. Operating results outside the United States also benefited from the translation of local currencies into the U.S. dollar.

Outlook — Crop Chemicals

Roundup and other glyphosate herbicides constituted the major portion of 1989 Crop Chemicals net sales. They will continue to be the dominant products for Crop Chemicals for the near future. Manufacturing capacity for glyphosate increased significantly in 1989. The patents protecting glyphosate herbicide have dates expiring between 1991 and 2000.

Crop Chemicals has a significant number of new products in the research and development pipeline. The focus continues to be on a number of traditional as well as biotechnology-related products. Some commercialization is in the early stages, but it will not materially affect 1990 sales.

Animal Sciences

	1989	1988	1987
Net Sales	**$159**	$169	$127
Operating Income (Loss)	**(42)**	(10)	(43)

The Animal Sciences business focuses on animal nutrition and growth products. The major commercial products are *Alimet* animal feed supplement and *Santoquin* feed antioxidant.

Sales volume for Alimet animal feed supplement grew substantially in 1989, but net sales and earnings declined because of price attrition brought about by intense competition. Facility start-up costs for several products also adversely affected operating results.

Approval by the U.S. Food and Drug Administration (FDA) is currently being sought for biotechnology-produced BST, a naturally occurring protein that enhances the efficiency of milk production in dairy cows. Expenditures for BST were higher in 1989 than 1988. The BST expenditures and the continuing research and development costs associated with porcine somatotropin (PST), a feed efficiency and growth rate enhancer that results in leaner pork, exceeded the profit generated by Animal Sciences product sales in 1989. The BST-related assets are a significant part of Animal Sciences total assets.

In 1988, Animal Sciences had record sales, primarily because of a substantial increase in the sales volume of *Alimet* animal feed supplement. Profit from product sales was not sufficient to generate operating income for the segment because of the high level of research and development costs associated with BST and PST.

Outlook — Animal Sciences

The market for *Alimet* animal feed supplement is expected to grow 4 to 5 percent per year, but pricing will continue to be a question for 1990 as competition remains intense. An *Alimet* production capacity expansion, started up in late 1989, increased the production capacity for *Alimet* 25 percent, positioning Animal Sciences to participate in the expected market growth.

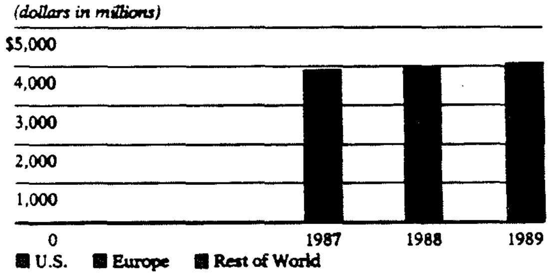
BST is not expected to be approved in the United States before late 1990. This product is also being reviewed for approval by the European Economic Community. BST is believed to have significant value to the dairy industry through the reduction of milk production costs, but it continues to meet opposition from factions that are opposed to products utilizing biotechnology. Animal Sciences is positioned to take advantage of BST's commercial potential immediately upon approval by the various regulatory bodies. The cost to maintain that state of readiness will continue to affect profitability adversely in 1990.

Chemicals

	1989	1988	1987
Net Sales:			
Detergents and phosphates	**$ 492**	$ 465	$ 457
Engineered products	**134**	109	200
Man-made fibers	**986**	962	950
Plastics	**855**	887	804
Resin products	**512**	509	490
Rubber and process chemicals	**627**	588	518
Specialties	**459**	469	439
Total	**$4,065**	$3,989	$3,858
Operating Income	**497**	486	450

The Chemicals 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 recorded another solid year in 1989, with net sales and operating income up 2 percent. Sales volume and selling prices were strong for almost all businesses, although some slackening of demand in the automotive markets in the United States and Canada did occur late in the year. Most raw material costs peaked in the first quarter, then generally decreased throughout the remainder of the year. Raw material costs for the full year 1989 were slightly lower than 1988. Capacity utilization, an important factor for Chemicals profitability, was 82 percent, versus 83 percent in 1988. Operating profit margin was unchanged at 12 percent of net sales.

Sales volume for *Lustran* ABS thermoplastics, *Vydyne* nylon and high-performance alloys and blends remained strong in 1989. Plastics profitability benefited as raw material costs declined year to year. Market demand softened somewhat in the United States and Canada late in the year due to the slowdown in automotive markets.

Saflex plastic interlayer sales benefited from continued advances in quality, technological innovations, and a worldwide motor vehicle market that was reasonably strong during the first three quarters of the year. Market and technology programs, which focused on the architectural business, have helped sustain above average growth rates and market shares. Architectural products have become a larger share of the *Saflex* business, helping to offset some of the cyclicality of the automotive markets. A major Belgian capacity expansion was completed with additional expansions under way in Brazil and Belgium.

Sales volume in 1989 for fibers products increased somewhat from 1988. Stain-resistant carpet fibers for *Wear-Dated* brand carpet continued to generate strong customer acceptance and demand. Selling price increases essentially recovered increases in overall raw material costs. Selling price improvement occurred for acrylic products.

Rubber and process chemicals products set records for sales volume in 1989. The rubber chemicals market is principally the replacement tire segment of the industry, where high demand has sustained pricing and profitability. Maleic anhydride, a process chemical, remained sold out for most of 1989 and additional capacity started up late in 1989.

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Manufacturing difficulties and start-up costs had an unfavorable effect on the detergents and phosphate results in 1989. Demand was also soft for phosphate-based detergent ingredients, as state and local governments continued to consider and enact phosphate bans. Specialties products sales performance was mixed.

In 1988, net sales in the Chemicals business overall increased 3 percent over 1987. Excluding businesses subsequently divested, 1988 net sales increased 9 percent. All continuing product lines enjoyed strong demand, particularly in the international markets. U.S. export sales increased 22 percent and sales of ex-U.S. manufactured products increased 16 percent for the continuing product lines in 1988. Overall, operating income in 1988 was up 8 percent, as higher 1988 sales volume and selling prices generated solid income gains. Higher plant capacity utilization (83 percent versus 80 percent in 1987) also contributed to the improved operating income. In addition, the translation of financial results denominated in other currencies into U.S. dollars had a positive effect on 1988 sales and operating income. Operating income in 1987 included $30 million in income from the actions instituted under the 1985 restructuring program.

Outlook – Chemicals

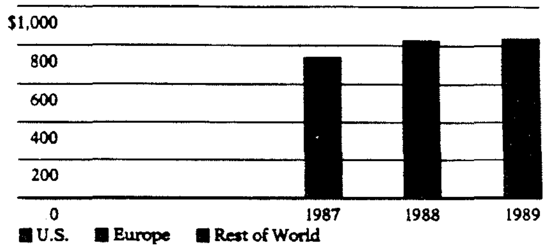
The Chemicals unit will be challenged to improve profitability in 1990 because of an anticipated slowdown in the U.S. economy, particularly the automotive market. But modest growth is anticipated in most other markets, and volume gains are expected from new production capacity for certain products. In addition, continued volume growth is expected in stain-resistant carpet fibers. Resolution of detergents and phosphates manufacturing problems experienced through much of 1989 and elimination of start-up costs in the detergents and phosphates and specialties product areas should provide volume and profit growth opportunities.

Fisher Controls

	1989	1988	1987
Net Sales:			
Final control systems	**$436**	$404	$346
Instrumentation	**208**	196	172
Other	**208**	240	231
Total	**$852**	$840	$749
Operating Income	**64**	29	26

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

Fisher Controls Net Sales
(dollars in millions)



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

In 1988, net sales increased 12 percent on the strength of customer demand and improved selling prices. In addition, this unit benefited from the favorable currency effect of a weaker U.S. dollar. Operating income increased 12 percent in 1988 despite raw material cost increases for specialty metal castings and electronic components and adverse inventory adjustments in part of the European operations.

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Outlook – Fisher Controls

Fisher Controls business is dependent primarily upon worldwide capital expenditures in the chemical, oil and gas, and pulp and paper industries. Sophisticated control valves and control systems may take months to produce. As a result, booked orders for production is a key indicator for future business performance. Booked orders and profit margins on those orders remained strong at year-end 1989, particularly in markets outside the United States. Historically, Fisher Controls performance has lagged behind the capital spending in its customers' markets by about nine months.

NutraSweet

	1989	1988	1987
Net Sales	**$869**	$736	$722
Operating Income	**180**	154	145

The NutraSweet Company manufactures and markets *NutraSweet* brand sweetener, which is sold worldwide. The company also markets *Equal* low-calorie tabletop sweetener throughout the United States.

On the strength of the best operating performance in its history, NutraSweet net sales in 1989 were up 18 percent and operating income up 17 percent. Factors favorably affecting the year-to-year increase in operating income included a 20 percent increase in volume led by strong demand from diet carbonated soft drink markets, and continued decreases in production costs. These factors were somewhat offset by 3 percent lower worldwide average selling prices and 27 percent higher marketing expenses, partially attributable to prelaunch costs for *Simplesse* all-natural fat substitute. NutraSweet assets declined in 1989 primarily because of the amortization of the aspartame patent.

In 1988, operating income increased 6 percent compared to 1987, principally because of production cost reductions and 10 percent higher sales volume for *NutraSweet* brand sweetener. The increased sales volume was attributable to the growth of the diet carbonated soft drink markets worldwide. While sales volume was higher, net sales increased only 2 percent because of lower worldwide average selling prices. Operating expenses increased as a result of higher marketing costs and expanded technological expenses associated with *Simplesse*.

Outlook – NutraSweet

The demand for low-calorie products worldwide is projected to continue to grow. However, the United States will continue to be the principal market for *NutraSweet* brand sweetener in 1990. Several projects to expand production capacity are under construction, including facilities in the United States and Brazil.

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

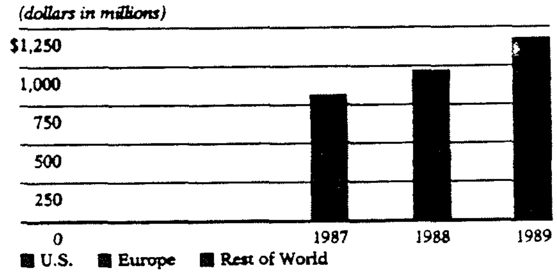
Simplesse all-natural fat substitute was affirmed as "generally recognized as safe" (GRAS) for use in frozen desserts by the U.S. Food and Drug Administration in February 1990. The use of *Simplesse* is already permitted by regulatory authorities in certain countries, including the United Kingdom and West Germany. *Simplesse* will begin generating revenue in 1990 as initial products using the fat substitute are launched, but will not have a material impact on 1990 sales.

Pharmaceuticals

	1989	1988	1987
Net Sales	**$1,178**	$973	$820
Operating Income (Loss)	**6**	(62)	(119)

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

Pharmaceuticals Net Sales
(dollars in millions)



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In 1989, Pharmaceuticals exceeded $1 billion in net sales and recorded its first year of operating profitability since the acquisition of Searle in 1985. Sales grew 21 percent, driven by an approximate 50 percent increase in sales for the *Calan* calcium channel blocker products for hypertension. *Calan* sales were $364 million in 1989. *Cytotec* ulcer preventive drug, the only drug approved for the prevention of gastric ulcers caused by many common arthritis medications, was launched in the United States. Net sales for *Cytotec* grew to $60 million in 1989 versus $13 million in 1988. The marketing and technological expenses associated with the launch and product development negated the profit contribution from *Cytotec*.

In addition to the U.S. market, Pharmaceuticals has significant presence in most other major pharmaceutical markets throughout the world. Sales volume increases were achieved in various markets in Europe and Canada. Net sales in 1989 included full-year results of the Italian pharmaceuticals company formed in September 1988. Another major step toward a stronger presence in Europe was achieved with the acquisition of a West German pharmaceuticals company in October 1989. Improved participation in the Japanese pharmaceuticals market continues to be an important focus for Searle. Japan is the only major market where Searle has not yet established a significant presence. Outside the United States, Searle sells *Equal* low-calorie tabletop sweetener, also marketed as *Canderel*, which accounted for $112 million in sales in 1989, up 32 percent from 1988.

Financial results continue to reflect significant investment in research and development (R&D). Pharmaceuticals R&D expenditures were 19 percent of net sales in 1989. This spending level demonstrates the commitment to product discovery that is aimed at securing a sound long-term financial performance for Pharmaceuticals.

In 1988, Pharmaceuticals had a sales growth of 19 percent, driven by the *Calan* calcium channel blocker products, which had a 79 percent increase in net sales in North America. Pharmaceuticals sales grew 13 percent outside the United States and several strategically important mergers, joint ventures and restructurings were completed to strengthen presence in the key world markets of West Germany, Italy and the United Kingdom. The operating loss in 1988 was reduced by 48 percent from 1987.

Outlook — Pharmaceuticals

Cytotec ulcer preventive drug is expected to begin contributing to profitability in 1990 as volume grows. *Cytotec* is anticipated to be launched in additional countries during the year. The *Calan* products are expected to continue with strong sales. Because patent protection in the United States has expired, this product could be subject to generic competition in 1990. *Kerlone*, a new beta blocker for the treatment of high blood pressure, received U.S. regulatory approval in 1989 and will be launched commercially in 1990.

Several products are positioned in the pipeline for commercialization in the next few years. These include misoprostol/diclofenac, an antiarthritis drug; topical spironolactone for the treatment of acne; *Maxaquin*, the first once-a-day anti-infective drug in the quinolone class; and zolpidem, the first of a new class of sleeping aid. Products currently in various stages of scientific development include products to reduce the rejection of transplanted organs, to treat Alzheimer's disease and schizophrenia, to treat AIDS (acquired immune deficiency syndrome) and other viral diseases, and to treat abnormal heart rhythms. A collaborative discovery program with Washington University in St. Louis continues; it encompasses 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, which could hold the key to unlocking the mechanisms of many diseases.

Biotechnology Product Discovery

The mission of Biotechnology Product Discovery is to generate product candidates and new technology in the area of human health, animal nutrition, plant-related agriculture and chemical products. The biotechnology capabilities developed over the past several years have been integrated with enhanced research expertise to maximize the application of biotechnology for the discovery of protein and chemical (non-protein) products. This research is coordinated with the strategic direction of the Crop Chemicals, Animal Sciences and Pharmaceuticals businesses. When product leads and new technologies are refined and clarified, they are transferred to these operating units for further development and commercialization.

Geographic Data

	Net Sales to Unaffiliated Customers			Operating Income (Loss)			Total Assets		
	1989	1988	1987	**1989**	1988	1987	**1989**	1988	1987
United States	**$5,590**	$5,219	$4,883	**$ 721**	$638	$501	**$6,169**	$6,240	$6,431
Europe-Africa	**1,800**	1,801	1,537	**282**	245	181	**1,657**	1,447	1,256
Canada	**430**	377	329	**50**	37	31	**150**	149	116
Latin America	**315**	304	293	**23**	27	2	**254**	242	235
Asia-Pacific	**546**	592	597	**60**	74	49	**388**	478	513
Inter-area Eliminations				**(4)**	(26)	6	**(290)**	(358)	(382)
Corporate				**(54)**	(40)	(36)	**276**	263	286
Total	**$8,681**	$8,293	$7,639	**$1,078**	$955	$734	**$8,604**	$8,461	$8,455

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 (e.g., a sale from the United States to Latin America is reported as a United States 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 44. The reported operating income for the ex-U.S. geographic areas does not include the full profitability generated by sales of Monsanto products imported from other locations, principally from the United States.

Operating income for the geographic segments does not include the equity income from Monsanto's joint venture companies, the largest of which are in Latin America and Asia-Pacific. Such equity income is reflected in "Other income — net" in the Statement of Consolidated Income. Monsanto's share of these unconsolidated sales in 1989 was $216 million for Latin America and $281 million for Asia-Pacific. Monsanto's net income included equity income of $5 million in Latin America and $9 million in Asia-Pacific.

United States Sales and Profit Increased

Net sales by entities in the United States increased 7 percent in 1989 on the strength of sales volume growth by Crop Chemicals herbicides, *NutraSweet* brand sweetener and, within Pharmaceuticals, the *Calan* antihypertensive drugs and first-year sales of *Cytotec* ulcer preventive drug in the United States. Chemicals and Fisher Controls products also had a solid year in net sales and operating income. Monsanto's U.S. operating income grew by 13 percent, primarily because of the sales growth from higher margin products. Direct export sales from the United States to non-U.S. third party customers were $467 million, $502 million and $408 million for 1989-1987, respectively.

In 1988, net sales increased 7 percent and profit grew 27 percent, with improvement experienced across all business segments. Crop Chemicals herbicides, *Alimet* animal feed supplement, and certain Chemicals and Pharmaceuticals products, primarily *Calan* SR calcium channel blocker, generated the most pronounced improvement. U.S. export sales volume, especially for Crop Chemicals and Chemicals, expanded during 1988 because of worldwide economic conditions and competitive pricing.

Europe-Africa Had Record Profit

Net sales in 1989 were level with 1988, principally because of Fisher Controls and Electronic Materials divestitures, which had 1988 net sales of $138 million. In addition, translation of European denominated currency sales into a strengthened U.S. dollar adversely affected 1989 net sales. Herbicides, rubber chemicals and *Saflex* plastic interlayer had higher sales volumes. Dry weather in northern Europe caused some moderation of the growth of glyphosate herbicides in the second half of the year, but volume still increased 30 percent year to year. Pharmaceuticals sales grew because of increasing market penetration for *Canderel* tabletop sweetener and the full-year sales of the Italian company formed in late 1988. Fisher Controls continuing businesses had significant increases in 1989 sales.

Operating income for 1989 was a record, up 15 percent. European profitability benefited from higher sales of Pharmaceuticals, Chemicals and continuing Fisher Controls products. Operating income was adversely affected by an increase in Animal Sciences BST costs. The expansion of *Saflex* plastic interlayer extrusion capacity and start of construction of a new *Butvar* resin plant, both in Belgium, along with the acquisition of a West German pharmaceuticals company, were highlights for the increasing investment in Europe.

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In 1988, net sales increased 17 percent, and operating income was up 35 percent. Selling price reductions, expansion of differentiated products, and innovative marketing programs produced a significant gain in sales volume and profit for glyphosate herbicides. *Lustran* ABS thermoplastics, *Saflex* plastic interlayer, rubber chemicals and pharmaceutical products also had improved sales volumes and profits due to strong market demand.

Canada Growth Continued

Sales increased 14 percent, while operating income improved 35 percent in 1989. Strong overall demand, broader applications for glyphosate herbicides and increases in the planted acreage for cereal grain produced higher Crop Chemicals sales and income. Strong Canadian capital investment and exports from Canada contributed to growth in sales volume for Fisher Controls. Chemicals sales and operating income were stable, with growth in new products and applications countering the effect of weaker housing and automotive markets. Pharmaceuticals also experienced sales growth for *Cytotec* ulcer preventive drug and *Isoptin* (sold as *Calan* SR in the United States).

In 1988, net sales increased 15 percent, and operating income increased 19 percent. Glyphosate and *Avadex* BW herbicides continued to be the principal products contributing to Canada's financial results. Pharmaceuticals had record sales, and Fisher Controls sales and operating income improved. Translation of a stronger Canadian dollar into the U.S. dollar was favorable for reporting financial results.

Latin America Results Were Mixed

Latin American sales increased $11 million, while operating income declined $4 million. Glyphosate herbicides sales increased 28 percent in 1989 led by growth in Brazil. Chemicals operating income was down year to year, as volume growth in Brazil did not compensate for the depressed economic climate in Argentina. Government-controlled selling price increases were not adequate to recover the high inflation rates on costs throughout Latin America. Profitability of Pharmaceuticals declined. Modest sales of *NutraSweet* brand sweetener were made in Brazil and Mexico during the year. Capital spending continued, with construction of new production facilities in Brazil for *Saflex* plastic interlayer, rubber chemical raw materials and *NutraSweet* brand sweetener.

In 1988, net sales increased 4 percent over 1987 in Latin America, and operating income grew significantly. Increases in glyphosate and *Lasso* herbicide sales volumes contributed to the sales and profit improvement. Sales volumes for rubber chemicals were higher in 1988 than in 1987.

Asia-Pacific Continuing Businesses Prospered

While 1989 net sales and operating income in Asia-Pacific declined 8 percent and 19 percent, respectively, results from continuing operations actually improved in 1989. The growth in the continuing businesses was not adequate to replace the $101 million in sales and $23 million in operating income in 1988 from subsequently divested nonstrategic businesses. Overall economic conditions were generally robust in the major Asian countries, with the exception of the People's Republic of China. Glyphosate herbicides sales increased 22 percent. Extraordinarily rapid volume growth for glyphosate products occurred 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.

In 1988, economic growth was very strong in Asia-Pacific, as operating income increased 51 percent despite a slight decline in net sales caused by the sale of the Australian commodity chemicals and plastics businesses early in 1988. The profit improvement in 1988 was generated principally from Crop Chemicals. The Chemicals businesses, led by plastics and specialties, also had solid financial performance. The Electronic Materials business, sold in 1989, contributed significantly to the positive 1988 results.

Quarterly Data

		First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total Year
Net Sales	**1989**	**$2,265**	**$2,348**	**$2,061**	**$2,007**	**$8,681**
	1988	2,127	2,263	2,022	1,881	8,293
Gross Profit	**1989**	**979**	**1,051**	**845**	**771**	**3,646**
	1988	890	977	764	690	3,321
Operating Income	**1989**	**364**	**397**	**216**	**101**	**1,078**
	1988	329	365	187	74	955
Net Income	**1989**	**222**	**241**	**126**	**90**	**679**
	1988	210	220	116	45	591
Earnings per Share	**1989**	**3.24**	**3.54**	**1.88**	**1.37**	**10.03**
	1988	2.86	3.04	1.67	0.70	8.27
Dividends per Share	**1989**	**0.75**	**0.85**	**0.85**	**0.85**	**3.30**
	1988	0.70	0.75	0.75	0.75	2.95
Common Stock Price						
1989	High	**95¾**	**111**	**124¼**	**122**	**124¼**
	Low	**80½**	**93⅞**	**105**	**108⅛**	**80½**
1988	High	89¾	89½	92⅜	83¾	92⅜
	Low	74	75½	73½	75	73½

Net sales and net income for each quarter of 1989 were higher than the comparable 1988 quarter. Monsanto's net income is historically higher during the first half of the year attributable primarily to a concentration of the generally more profitable Crop Chemicals sales in the first half of the year. In addition, NutraSweet sales fluctuate from quarter to quarter.

The only significant unusual item affecting quarterly net income was the fourth quarter 1989 gain of $36 million on the sale of the analgesics business.

Statement of Consolidated Financial Position

(Dollars in millions, except per share)	At December 31,	
Assets	**1989**	1988
Current Assets:		
Cash, time deposits and certificates of deposit	**$ 198**	$ 203
Short-term securities, at cost which approximates market	**55**	18
Trade receivables, net of allowances of $23 in 1989 and $28 in 1988	**1,309**	1,234
Miscellaneous receivables and prepaid expenses	**295**	284
Deferred income tax benefit	**194**	188
Inventories	**1,197**	1,170
Total Current Assets	**3,248**	3,097
Intangible Assets, net of accumulated amortization of $1,029 in 1989 and $798 in 1988	**1,682**	1,790
Investments in Affiliates	**204**	205
Other Assets	**297**	223
Property, Plant and Equipment:		
Land	**105**	111
Buildings	**1,100**	1,122
Machinery and equipment	**5,370**	5,388
Construction-in-progress	**362**	305
Total property, plant and equipment	**6,937**	6,926
Less accumulated depreciation	**3,764**	3,780
Net Property, Plant and Equipment	**3,173**	3,146
Total Assets	**$8,604**	$8,461

Liabilities and Shareowners' Equity

Current Liabilities:		
Accounts payable	**$ 514**	$ 545
Wages	**223**	208
Income and other taxes	**126**	124
Miscellaneous accruals	**554**	547
Short-term debt	**505**	556
Total Current Liabilities	**1,922**	1,980
Long-Term Debt	**1,471**	1,408
Deferred Income Taxes	**621**	588
Other Liabilities	**649**	685
Shareowners' Equity:		
Common stock — authorized, 200,000,000 shares, par value $2; issued, 82,197,097 shares in 1989 and 1988	**164**	164
Additional contributed capital	**877**	874
Accumulated currency adjustment	**24**	52
Reinvested earnings	**4,120**	3,662
Treasury stock, at cost (16,050,656 shares in 1989 and 13,364,917 shares in 1988)	**(1,244)**	(952)
Total Shareowners' Equity	**3,941**	3,800
Total Liabilities and Shareowners' Equity	**$8,604**	$8,461

The above statement should be read in conjunction with pages 39 through 44 of this report.

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Monsanto's financial position remained strong in 1989. Financial resources were readily available to support existing businesses and to fund new business opportunities.

Working capital at year-end 1989 was $1,326 million, $209 million higher than year-end 1988. The higher 1989 year-end working capital principally resulted from higher trade receivables and lower short-term debt. Trade receivables at year-end 1989 increased $75 million, primarily because of the higher sales level during the last quarter of 1989. Inventories at year-end increased $27 million from 1988, with a turnover ratio approximating 4 times per year.

Intangible assets declined due to amortization, principally of The NutraSweet Company's aspartame patent, which had a recorded value of $518 million at year-end 1989. Intangible assets acquired during 1989, primarily in the Pharmaceuticals business, totaled $120 million. Net property, plant and equipment increased slightly in 1989, as $607 million of capital additions exceeded depreciation and the effect of divested businesses. The increase in other assets in 1989 resulted primarily from miscellaneous long-term investments.

As mentioned in the notes to financial statements on page 40, Monsanto has not yet adopted Statement of Financial Accounting Standards No. 96, the new income tax accounting standard, which must be adopted by 1992.

Total short- and long-term debt at year-end 1989 was about the same level as the prior year-end. Proceeds of $261 million from 1989 long-term debt financings were used to retire existing short- and long-term debt. In order to maintain adequate financial flexibility and access to debt markets worldwide, Monsanto management intends to maintain an "A" debt rating in the United States. An important factor in establishing that rating is the interest coverage ratio, which improved to 5.9 in 1989 from 5.5 in 1988. Monsanto's current debt rating is "A" or better.

Monsanto uses international financial markets 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 41). 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 43.

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. This risk includes liability insurance on the "claims made" policy basis. 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.

Key Financial Statistics	**1989**	1988	1987
Return on Equity (ROE) (Net income divided by average shareowners' equity)	**17.6%**	15.4%	11.4%
Working Capital (Current assets less current liabilities)	**$1,326**	$1,117	$1,203
Current Ratio (Current assets divided by current liabilities)	**1.7**	1.6	1.7
Interest Coverage	**5.9**	5.5	4.5
Cash Provided by Operations/Total Debt	**52%**	66%	43%
Total Debt/Total Capitalization*	**33%**	34%	35%

**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)

Increase (Decrease) in Cash and Cash Equivalents	1989	1988	1987
Operating Activities:			
Net income	**$ 679**	$ 591	$ 436
Add income tax expense	**336**	302	237
Income before income taxes	**1,015**	893	673
Adjustments to reconcile to Cash Provided by Operations:			
Income tax payments	**(294)**	(235)	(229)
Items that did not use (provide) cash:			
Depreciation and amortization	**690**	703	679
Restructuring income — net			(32)
Other	**(27)**	14	37
Working capital changes that provided (used) cash:			
Accounts receivable	**(131)**	(46)	(172)
Inventories	**(90)**	(136)	(22)
Accounts payable and accrued liabilities	**(48)**	86	13
Other	**(17)**	67	(19)
Nonoperating pre-tax gains from asset disposals	**(61)**	(42)	(26)
Cash Provided by Operations	**1,037**	1,304	902
Investing Activities:			
Property, plant and equipment purchases	**(607)**	(590)	(505)
Acquisition and investment payments	**(211)**	(100)	(59)
Investment and property disposal proceeds	**307**	121	75
Cash Used in Investing Activities	**(511)**	(569)	(489)
Financing Activities:			
Net change in short-term financing	**(50)**	53	150
Long-term debt proceeds	**261**	21	26
Long-term debt reductions	**(196)**	(167)	(122)
Treasury stock purchases	**(335)**	(457)	(339)
Dividend payments	**(221)**	(211)	(212)
Other financing activities	**47**	24	33
Cash Used in Financing Activities	**(494)**	(737)	(464)
Increase (Decrease) in Cash and Cash Equivalents	**32**	(2)	(51)
Cash and Cash Equivalents*:			
Beginning of year	**221**	223	274
End of year	**$ 253**	$ 221	$ 223

The above statement should be read in conjunction with pages 39 through 44 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 $171 million, $167 million and $167 million, for the years 1989-1987, respectively.
**Includes cash, time deposits, certificates of deposit and short-term securities.*

Monsanto's cash flow for the three-year period of 1989-1987 is shown in the Statement of Consolidated Cash Flow on the preceding page.

Cash from operations in 1989 was generated principally by the Chemicals unit, with Crop Chemicals and The NutraSweet Company also contributing significantly. Cash provided by operations was strong, totaling $1,037 million, but declined 20 percent from 1988, because of the increased working capital needed to finance sales growth. 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 its future requirements.

Investment and property disposals in 1989 generated $307 million of cash. The principal proceeds in 1989 were related to the divestitures 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 included capital expenditures, stock purchases, dividends and acquisitions. The principal acquisitions were a West German pharmaceuticals company in 1989 and the formation of an Italian pharmaceuticals company in 1988. Monsanto's 1989 capital expenditures focused on improved technology and capacity expansions and totaled $607 million, up slightly versus the prior year. The more significant expenditures were for expansion of production capacity for glyphosate herbicides, *Alimet* animal feed supplement, *Saflex* plastic interlayer and the NutraSweet business.

Long-term debt proceeds in 1989 included $99 million in 20-year, 8⅞ percent debentures and $50 million from the issuance of medium-term notes. These proceeds enabled Monsanto to refinance short-term commercial paper borrowings to obtain a more balanced mix of short- and long-term debt.

Monsanto is subject to various laws and governmental regulations concerning employee health, product safety and environmental matters. Monsanto anticipates that increasingly stringent requirements will be imposed upon Monsanto and the entire chemical industry. 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 hazardous air emissions by the end of 1992, a goal that will require the development and installation of new technology. Reduction of 17 percent was accomplished through 1988. Compilation of data for 1989 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.

Expenditures in 1989 were approximately $60 million for environmental capital projects and approximately $225 million for operation and maintenance of environmental protection facilities. Monsanto is negotiating with various government agencies concerning Superfund cleanup sites and is a defendant in various suits related to a waste disposal site in which the plaintiffs make claims for large amounts of actual and punitive damages. Monsanto spent $27 million in 1989 for remediation of waste disposal sites. Most of these expenditures relate to the Chemicals segment, 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. 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, or the outcome of litigation with other parties.

Monsanto Stock — A Sound Investment

In December 1989, Monsanto's Board of Directors authorized the purchase of an additional 5 million shares of Monsanto common stock. By year-end 1989, Monsanto had purchased all of the 13 million shares authorized in 1987 and 1988, at a cost of $1,131 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 17th Consecutive Year

Monsanto has paid dividends on its common shares without interruption or reduction since 1928, and has increased the dividend in each of the past 17 years. Dividend payout for 1989 was 21 percent of cash provided by operations and 33 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 of Tokyo and seven European cities. The number of shareowners of record as of February 23, 1990, was 61,723, and the high and low common stock prices on that date were $111¼ and $108½.

Statement of Consolidated Shareowners' Equity

(Dollars in millions, except per share)	**1989**	1988	1987
Common Stock:			
Balance, January 1 and December 31	**$ 164**	$ 164	$ 164
Additional Contributed Capital:			
Balance, January 1	**$ 874**	$ 872	$ 861
Employee stock plans	**3**	2	11
Balance, December 31	**$ 877**	$ 874	$ 872
Accumulated Currency Adjustment:			
Balance, January 1	**$ 52**	$ 100	$ (98)
Translation adjustments	**(17)**	(53)	197
Income taxes	**(11)**	5	1
Balance, December 31	**$ 24**	$ 52	$ 100
Reinvested Earnings:			
Balance, January 1	**$ 3,662**	$3,282	$3,058
Net income	**679**	591	436
Dividends	**(221)**	(211)	(212)
Balance, December 31	**$ 4,120**	$3,662	$3,282
Treasury Stock:			
Balance, January 1	**$ (952)**	$ (517)	$ (204)
Shares purchased (3,274,400; 5,605,300 and 4,120,100 shares in 1989-1987, respectively)	**(335)**	(457)	(339)
Shares issued under employee stock plans (588,661; 339,963 and 558,528 shares in 1989-1987, respectively)	**43**	22	26
Balance, December 31	**$(1,244)**	$ (952)	$ (517)

The above statement should be read in conjunction with pages 39 through 44 of this report.

Key Financial Statistics

		1989	1988	1987
Stock Price*	High	**$ 124¼**	$ 92⅜	$ 100¼
	Low	**80½**	73½	57
	Year-end	**115⅝**	81¾	83
Per Share	Dividends	**3.30**	2.95	2.75
	Shareowners' Equity	**59.58**	55.21	52.65
Average Daily Share Trading Volume (thousands of shares)		**213**	323	372

**Based on daily reported high and low stock prices.*

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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 cruzado, Canadian dollar, French franc, Italian lira, Japanese yen, Mexican peso and West German mark. Currency restrictions are not expected to have a significant effect on Monsanto's cash flow, liquidity or capital resources.

Principal Acquisitions and Divestitures

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

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 $0.53 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 and $164 million for the full-year 1987) were sold in March 1988.

The pro forma operating results of the acquired businesses and the income effect of the divested businesses (other than the analgesics business) were not material.

Depreciation and Amortization

	1989	1988	1987
Depreciation	**$438**	$435	$421
Amortization of intangible assets	**226**	231	225
Obsolescence	**26**	37	33
Total	**$690**	$703	$679

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 as follows:

	Estimated Remaining Life*	1989	1988
Patents	4	**$ 679**	$ 864
Goodwill	34	**737**	653
Other intangible assets	21	**266**	273
Total		**$1,682**	$1,790

**Weighted average, in years, at December 31, 1989.*

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. 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). 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 as follows:

	1989	1988
Finished goods	**$ 723**	$ 662
Goods in process	**314**	333
Raw materials and supplies	**506**	545
Inventories, at FIFO cost	**1,543**	1,540
Excess of FIFO over LIFO cost	**(346)**	(370)
Total	**$1,197**	$1,170

Inventories at FIFO cost approximate current cost.

Income Taxes

The components of income before income taxes were:

	1989	1988	1987
U.S.	**$ 570**	$481	$422
Ex-U.S.	**445**	412	251
Total	**$1,015**	$893	$673

The components of income tax expense were:

	1989	1988	1987
Current:			
Federal	**$138**	$111	$ 82
State	**18**	18	14
Ex-U.S.	**142**	139	72
	298	268	168
Deferred:			
Federal	**26**	31	39
State	**3**	1	9
Ex-U.S.	**9**	2	21
	38	34	69
Total	**$336**	$302	$237

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 as follows:

	1989	1988	1987
Depreciation and obsolescence	**$25**	$ 28	$ 46
Restructuring program	**16**	31	43
Employee benefit plans	**10**	(12)	15
Other	**(13)**	(13)	(35)
Total	**$38**	$ 34	$ 69

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

	1989	1988	1987
Federal statutory rate	**34%**	34%	40%
Lower ex-U.S. tax rates	**—**	—	(1)
Capital gains benefits	**—**	—	(2)
Benefits attributable to:			
United States export earnings	**(2)**	(2)	(2)
Puerto Rico operations	**(2)**	(1)	(2)
Other	**3**	3	2
Effective income tax rate	**33%**	34%	35%

Income and remittance taxes have not been recorded on $552 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.

Various ex-U.S. subsidiaries have tax loss carryforwards for which no tax benefits have been recorded. These carryforwards totaled $36 million at December 31, 1989, a portion of which has an unlimited carryforward period.

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 standard 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:

	1989	1988
Notes payable:		
Banks	**$145**	$ 79
Commercial paper	**182**	228
Bank overdrafts	**134**	121
Current portion of long-term debt	**44**	128
Total	**$505**	$556

Maximum amount of notes payable and bank overdrafts outstanding at any month-end	**$857**	$588
Average notes payable and bank overdrafts outstanding	**623**	411
Weighted average interest rate during the year	**9.9%**	9.9%
Weighted average interest rate at December 31	**9.7%**	7.9%

Monsanto has aggregate short-term loan facilities of $404 million, under which loans totaling $145 million were outstanding at December 31, 1989. Interest on these loans is related to various bank rates. Monsanto's worldwide unused short-term loan facilities were $259 million at December 31, 1989.

Long-Term Debt

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

	1989	1988
Industrial development bond obligations, weighted average interest rate of 7¼%, due 1991 to 2021	**$ 266**	$ 256
9¾% Eurodollar notes due 1991	**59**	101
10¼% notes due 1992	**150**	150
9⅜% notes due 1996	**150**	150
8½% sinking fund debentures due 2000	**127**	127
8¾% sinking fund debentures due 2008	**170**	169
8⅞% debentures due 2009	**99**	
11⅜% sinking fund debentures due 2015	**214**	214
Other	**236**	241
Total	**$1,471**	$1,408

Maturities and sinking fund requirements on long-term debt are $44 million, $89 million, $193 million, $30 million and $63 million for 1990-1994, respectively.

A $750 million intermediate-term credit facility expires ratably from 1991 to 1994. There were no borrowings under this facility at December 31, 1989. The credit facility is used to support the issuance of commercial paper ($182 million outstanding at December 31, 1989). 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.

Pension Benefits

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

	1989	1988	1987
Service cost for benefits earned during the year	**$ 63**	$ 65	$ 64
Interest cost on projected benefit obligation	**227**	223	212
Assumed return on plan assets*	**(251)**	(246)	(237)
Amortization of unrecognized net gain	**(40)**	(38)	(32)
Total	**$ (1)**	$ 4	$ 7

* *Actual return on plan assets was $658 million in 1989, $340 million in 1988 and $187 million in 1987.*

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.

The excess of the fair value of plan assets over the projected benefit obligation as of January 1, 1986 for each plan is being amortized over the average expected future service period of employees (ranging generally from 14 to 18 years). The fair value of plan assets was used to calculate the assumed return on plan assets.

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Assumptions used for the principal plans in 1989-87 were as follows:

Discount rate	8½%
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:

	1989	1988
Plan assets at fair value	**$3,647**	$3,169
Actuarial present value of plan benefits:		
Vested	**$2,299**	$2,202
Nonvested	**122**	110
Accumulated benefit obligation	**2,421**	2,312
Effect of projected future salary increases	**347**	328
Projected benefit obligation	**$2,768**	$2,640
Excess of plan assets over projected benefit obligation	**$ 879**	$ 529
Less:		
Unrecognized net gain at January 1, 1986	**341**	386
Subsequent unrecognized net gain	**661**	302
Accrued pension liability	**$ 123**	$ 159

Projected benefit obligations and plan assets included in the above table for the principal United States plans were approximately $2,544 million and $3,273 million, respectively, at December 31, 1989. Plan assets consist principally of common stocks and United States 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 1989-1987.

For some employee savings plans, employee contributions are matched in part by Monsanto. The 1989-1987 expense recorded for such plans was $32 million, $34 million and $33 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 United States 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, 1989, approximately 26,200 active employees were eligible upon retirement to participate in these programs. In addition, approximately 17,300 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 1989-1987 expense recorded for other postretirement benefits was $39 million, $38 million and $37 million, respectively.

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 is presented below.

	Shares		Price
	Exercisable	Outstanding	per Share
December 31, 1987	1,203,305	2,525,057	$26.16 - $94.19
1988:			
Granted		1,226,582	75.88 - 89.44
Exercised		(370,451)	26.16 - 79.31
Expired		(67,833)	45.63 - 94.19
December 31, 1988	1,319,795	3,313,355	26.16 - 94.19
1989:			
Granted		**619,021**	**81.19 - 122.88**
Exercised		**(680,584)**	**26.16 - 94.19**
Expired		**(49,393)**	**31.38 - 94.19**
December 31, 1989	**1,315,734**	**3,202,399**	**26.16 - 122.88**

Under the 1988 Management Incentive Plans and the Searle Plan, 3,269,251 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, 1989, SARs related to stock options for 1,157,127 shares were outstanding, of which 368,286 options were exercisable. During 1989, SARs related to stock options for 192,758 shares were granted and for 164,349 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 (67,748,052; 71,501,322 and 77,498,752 in 1989-1987, respectively). Common share equivalents (536,777; 344,986 and 645,527 in 1989-1987, 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, 1989, there were 6,471,650 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 Company's existing Common Stock Purchase Rights at their redemption price of 5 cents per right.

Commitments and Contingencies

Commitments, principally in connection with uncompleted additions to property, were approximately $214 million at December 31, 1989. Monsanto was contingently liable as guarantor of bank loans and for discounted customers' receivables totaling approximately $94 million at December 31, 1989. Future minimum payments under noncancellable operating leases and unconditional inventory purchases are $128 million; $146 million; $139 million; $123 million and $46 million for 1990-1994, respectively, and $221 million thereafter.

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 as follows:

	1989	1988	1987
Raw material and energy costs	**$2,659**	$2,587	$2,383
Employee compensation and benefits	**2,045**	2,022	1,955
Current income and other taxes	**562**	527	398
Rent expense	**119**	115	108
Technological expenses:			
Research and development	**598**	575	557
Engineering, commercial development and patent	**74**	73	58
Total technological expenses	**672**	648	615
Interest expense:			
Total interest cost	**204**	193	188
Less capitalized interest	**(22)**	(19)	(16)
Net interest expense	**182**	174	172
Equity in affiliates' income (loss)	**1**	(5)	7
Currency gains (losses) including equity in affiliates' currency gains and losses	**(31)**	(20)	(11)

Segment Information

Certain operating unit segment data and geographic data for 1989-1987 appear on pages 25 and 31 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)		
	1989	1988	1987
World area shipped from:			
United States	**$ 817**	$ 855	$ 624
Europe-Africa	**180**	167	103
Canada	**11**	13	8
Latin America	**35**	22	12
Asia-Pacific	**11**	39	35
Inter-area Eliminations	**(1,054)**	(1,096)	(782)
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.

	1989	1988	1987
Operating income	**$ 415**	$ 383	$ 263
Interest expense	**(50)**	(54)	(52)
Interest income	**57**	45	38
Other income – net	**23**	38	2
Income taxes	**(151)**	(141)	(93)
Net income of consolidated ex-U.S. subsidiaries	**$ 294**	$ 271	$ 158
Total operating assets	**$2,449**	$2,316	$2,120
Total liabilities	**983**	1,040	801
Net assets of consolidated ex-U.S. subsidiaries	**$1,466**	$1,276	$1,319

Financial Summary

(Dollars in millions, except per share)	**1989[1]**	1988	1987[2]	1986[3]	1985[4]
Operating Results					
Net Sales	**$8,681**	$8,293	$7,639	$6,879	$6,747
Operating Income (Loss)	**1,078**	955	734	635	(598)
As a Percent of Net Sales	**12%**	12%	10%	9%	(9)%
Income (Loss) Before Extraordinary Gain	**679**	591	436	433	(128)
Net Income (Loss)	**679**	591	436	433	(98)
As a Percent of Net Sales	**8%**	7%	6%	6%	(1)%
Return on Shareowners' Equity	**17.6%**	15.4%	11.4%	12.0%	(2.8)%
Earnings per Share					
Before Extraordinary Gain	**$10.03**	$ 8.27	$ 5.63	$ 5.55	$ (1.67)
Net Income (Loss)	**10.03**	8.27	5.63	5.55	(1.27)
Year-end Financial Position					
Total Assets	**$8,604**	$8,461	$8,455	$8,269	$8,877
Working Capital	**1,326**	1,117	1,203	1,092	899
Property, Plant and Equipment:					
Gross	**$6,937**	$6,926	$6,730	$6,326	$6,840
Net	**3,173**	3,146	3,076	2,913	3,034
Long-Term Debt	**$1,471**	$1,408	$1,564	$1,630	$2,087
Shareowners' Equity	**3,941**	3,800	3,901	3,781	3,407
Current Ratio	**1.7**	1.6	1.7	1.6	1.4
Percent of Total Debt to Total Capitalization	**33%**	34%	35%	35%	45%
Other Data					
Property, Plant and Equipment Purchases	**$ 607**	$ 590	$ 505	$ 520	$ 645
Depreciation and Amortization	**690**	703	679	780	599
Interest Expense	**182**	174	172	201	178
Research and Development Expenses	**598**	575	557	523	470
Income Taxes	**336**	302	237	203	(170)
Cash Provided by Operations	**1,037**	1,304	902	960	535
Stock Price:					
High	**$124¼**	$ 92⅜	$100¼	$ 81½	$ 55⅜
Low	**80½**	73½	57	44¾	40⅝
Year-end	**115⅝**	81¾	83	76½	47¾
Price/Earnings Ratio on Year-end Stock Price	**12**	10	15	14	–
Per Share:					
Dividends	**$ 3.30**	$ 2.95	$ 2.75	$2.575	$ 2.45
Shareowners' Equity	**59.58**	55.21	52.65	48.69	44.38
Shareowners (year-end)	**61,942**	66,066	68,032	70,367	72,081
Shares Outstanding (year-end, in millions)	**66**	69	74	78	77
Employees (year-end)	**42,179**	45,635	49,734	51,703	56,103

(1) Net income for 1989 includes a $36 million ($0.53 per share) gain on the sale of the analgesics business.

(2) Net income for 1987 includes net restructuring income of $18 million ($0.24 per share).

(3) Net income for 1986 includes $85 million ($1.10 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. In addition, net income was increased $25 million ($0.32 per share) from adopting the requirements of Statement of Financial Accounting Standards No. 87, "Employers' Accounting for Pensions."

(4) Net loss for 1985 includes net restructuring expense of $542 million ($7.04 per share), the gain from the sale of the oil and gas operations of $201 million ($2.61 per share) and an extraordinary gain of $30 million ($0.40 per share) from repayment of debt.

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Officers

Chairman and Chief Executive Officer

Richard J. Mahoney

President and Chief Operating Officer

Earle H. Harbison, Jr.

Executive Vice President

Nicholas L. Reding

Senior Vice Presidents

Harold J. Corbett
Howard A. Schneiderman, Ph.D.

Senior Vice President and Chief Financial Officer

Francis A. Stroble

Senior Vice President, Secretary and General Counsel

Richard W. Duesenberg

Group Vice President

Robert G. Potter

Vice Presidents

Barry Blitstein
Earl N. Brasfield
Leonard A. Cohn
A. Nicholas Filippello, Ph.D.
S. Allen Heininger, 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 Controller

B. Clare Harris

Vice President and Treasurer

Juanita H. Hinshaw

Monsanto Advisory Directors

Harold J. Corbett
St. Louis
Senior Vice President, Environment, Safety and Health, Monsanto Company
Age: 62
Advisory Director: 5 years

Robert G. Potter
St. Louis
Group Vice President, Monsanto Company; President, Monsanto Chemical Company
Age: 50
Advisory Director: 4 years

Nicholas L. Reding
St. Louis
Executive Vice President, Monsanto Company; President, Monsanto Agricultural Company
Age: 55
Advisory Director: 8 years

Howard A. Schneiderman, Ph.D.
St. Louis
Senior Vice President, Research and Development, Monsanto Company
Age: 63
Advisory Director: 8 years

Francis A. Stroble
St. Louis
Senior Vice President and Chief Financial Officer, Monsanto Company
Age: 59
Advisory Director: 8 years

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Board of Directors

Richard J. Mahoney
St. Louis
Chairman and Chief Executive Officer, Monsanto Company
Age: 56
Monsanto Director: 11 years

Marguerite Ross Barnett, Ph.D.
St. Louis
Chancellor, University of Missouri–St. Louis
Age: 47
Monsanto Director: 2 years

Joan T. Bok
Westborough, Massachusetts
Chairman, New England Electric System
Age: 60
Monsanto Director: 3 years

Donald C. Carroll, Ph.D.
King of Prussia, Pennsylvania
Chairman, Schulco, Inc.;
Retired Dean, The Wharton School, University of Pennsylvania
Age: 59
Monsanto Director: 15 years

C. Raymond Dahl
San Francisco
Retired Chairman and Chief Executive Officer, Crown Zellerbach Corporation
Age: 68
Monsanto Director: 12 years

Richard I. Fricke
Montpelier, Vermont
Retired Chairman and Chief Executive Officer, National Life Insurance Company
Age: 67
Monsanto Director: 15 years

John W. Hanley
Palm City, Florida
Chairman, Hanley Hazelden Center; Retired Chairman and Chief Executive Officer, Monsanto Company
Age: 68
Monsanto Director: 17 years

Earle H. Harbison, Jr.
St. Louis
President and Chief Operating Officer, Monsanto Company
Age: 61
Monsanto Director: 4 years

Robert M. Heyssel, M.D.
Baltimore
President and Chief Executive Officer, The Johns Hopkins Health System and The Johns Hopkins Hospital
Age: 61
Monsanto Director: 1 year

Philip Leder, M.D.
Boston
Chairman, Department of Genetics, Harvard Medical School; Senior Investigator, Howard Hughes Institute
Age: 55
Monsanto Director: less than 1 year

Howard M. Love
Pittsburgh
Chairman and Chief Executive Officer, National Intergroup, Inc.
Age: 59
Monsanto Director: 12 years

Frank A. Metz, Jr.
Armonk, New York
Senior Vice President, Finance and Planning, and Chief Financial Officer, International Business Machines Corporation
Age: 56
Monsanto Director: less than 1 year

Buck Mickel
Greenville, South Carolina
Chairman and Chief Executive Officer, R.S.I. Corp.; Retired Vice Chairman, Fluor Corp.;
Retired Chairman, Daniel International Corp., a Fluor subsidiary
Age: 64
Monsanto Director: 15 years

John S. Reed
New York
Chairman, Citicorp and Citibank, N.A.
Age: 51
Monsanto Director: 5 years

William D. Ruckelshaus
Houston
Chairman and Chief Executive Officer, Browning-Ferris Industries, Inc.;
Former Administrator, U.S. Environmental Protection Agency
Age: 57
Monsanto Director: 5 years

John B. Slaughter, Ph.D.
Los Angeles
President, Occidental College;
Former Director, National Science Foundation
Age: 56
Monsanto Director: 7 years

Admiral Stansfield Turner
(U.S. Navy, Retired)
West Point, New York
Olin Professor of National Security, U.S. Military Academy at West Point; Lecturer and Writer;
Former Director, U.S. Central Intelligence and Central Intelligence Agency
Age: 66
Monsanto Director: 9 years

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

John W. Hanley, Chairman
Marguerite Ross Barnett, Ph.D.
Earle H. Harbison, Jr.
Richard J. Mahoney

Executive Compensation and Development Committee

Howard M. Love, Chairman
Richard I. Fricke
John W. Hanley
Buck Mickel

Finance Committee

Donald C. Carroll, Ph.D., Chairman
Marguerite Ross Barnett, Ph.D.
C. Raymond Dahl
John W. Hanley
Richard J. Mahoney
John S. Reed

Nominating Committee

Buck Mickel, Chairman
C. Raymond Dahl
Howard M. Love

Pension and Savings Funds Committee

Richard I. Fricke, Chairman
Donald C. Carroll, Ph.D.
Earle H. Harbison, Jr.
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 27, 1990, 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
A copy of Monsanto Company's 1989 Form 10-K Report filed with the Securities and Exchange Commission; 1989 Corporate Data Book, which contains additional information relating to Monsanto; and Investor News can be obtained by writing to:

Investor Relations Department
Monsanto Company
800 N. Lindbergh Blvd.
St. Louis, Missouri 63167

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

A Tribute to John Hanley

John W. Hanley will retire from Monsanto's Board of Directors on April 27, 1990, after serving the company and its stake holders with distinction for more than 17 years.

Hanley, elected president and chief executive officer in November 1972, led an era of dramatic change at Monsanto.

Hanley expanded Monsanto's commitment to scientific research by establishing new relationships with leading academic institutions, and he advanced the company's entry into the promising field of biotechnology. One of the world's premier biotechnology research laboratories was constructed near St. Louis under Hanley's leadership.

In addition, Hanley set up major new internal management systems and implemented development programs for managers to provide for the long-term leadership of the company.

When Hanley joined Monsanto, the company's annual net sales were $2.2 billion. By 1984, when he stepped down as chief executive officer, net sales had reached $6.3 billion. During his tenure, the market value of Monsanto's stock rose 119 percent.

Hanley's dedication to professional management, product excellence and scientific innovation, and his concern for corporate citizenship and industrial responsibility are commitments Monsanto preserves to this day.

Now, at the mandatory retirement age of 68, he steps down. His many contributions helped put Monsanto on course to becoming one of the world's leading corporations. For this, we extend our deep-felt thanks to Jack Hanley.

Monsanto Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63167