Monsanto



1978 ANNUAL REPORT

MONSANTO COMPANY

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The Cover

Monsanto provides scores of products to meet the needs of the consuming public worldwide. The cover depicts products and activities illustrative of the Company's five operating units.

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Annual Meeting

The next Annual Meeting of the shareowners of Monsanto Company will be held at 2:30 p.m., Friday, April 27, 1979, at the Company's General Offices, 800 N. Lindbergh Blvd., St. Louis County, Mo. A formal notice of the meeting, together with a proxy statement and form of proxy, is being mailed to each shareowner.

10-K Report Available

A copy of Monsanto Company's Form 10-K Report filed with the Securities and Exchange Commission for 1978, which contains additional information relating to Monsanto, can be obtained by writing to: Shareowner Relations Department, Monsanto Company, 800 N. Lindbergh Blvd., St. Louis, Mo. 63166.

Italics identify Monsanto's trademarks.

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OPERATIONAL HIGHLIGHTS

(Dollars in millions, except per share)

	1978	1977
Net Sales	**$5,018.7**	$4,594.5
Net Income	**$ 302.6**	$ 275.6
Per Common Share:		
Primary Earnings	**$ 8.29**	$ 7.46
Fully Diluted Earnings	**8.21**	7.37
Dividends	**3.175**	3.025
Shareowners' Equity	**71.26**	66.16
Property, Plant and Equipment Additions	**$ 479.9**	$ 607.1
Depreciation, Obsolescence and Depletion	**$ 288.3**	$ 296.0
Taxes—Income, Payroll, Property and Other	**$ 419.0**	$ 375.2
Research and Development	**$ 144.3**	$ 132.3
Year End:		
Shareowners—Common Shares	**86,775**	85,021
Employees	**62,851**	61,519

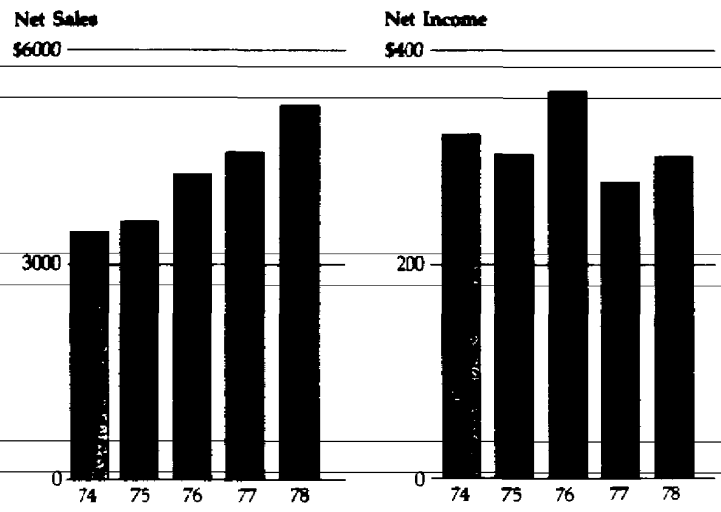
Operating Results by Operating Company

	1978		1977	
	Net Sales	**Income**	Net Sales	Income
Operating Company:				
Agricultural Products	**$ 734.4**	**$303.8**	$ 654.0	$274.3
Chemical Intermediates	**523.2**	**75.1**	522.0	128.0
Industrial Chemicals	**1,290.1**	**218.7**	1,156.4	211.9
Plastics & Resins	**1,223.6**	**57.6**	1,111.2	76.3
Textiles	**963.2**	**(29.2)**	884.3	(39.0)
Total Operating Companies	**4,734.5**	**626.0**	4,327.9	651.5
Fisher Controls	**284.2**	**37.0**	263.5	37.9
Total Operating Companies and Fisher Controls	**5,018.7**	**663.0**	4,591.4	689.4
Cycle-Safe Containers			3.1	(51.9)
Eliminations and Unallocated Corporate Expenses		**(31.3)**		(27.8)
Sales and Operating Income	**$5,018.7**	**631.7**	$4,594.5	609.7
Income Charges (Credits)—Net		**55.4**		86.0
Income Before Income Taxes		**576.3**		523.7
Income Taxes		**273.7**		248.1
Net Income		**$302.6**		$275.6

As more fully explained on page 36, operating results for the operating companies have been restated from the prior year principally because of a reorganization of responsibilities among operating companies. Monsanto Company's consolidated operating results were not affected by these changes.

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TO OUR SHAREOWNERS

An Annual Report, by name and by nature, tends to focus on a finite period of history. But this information is most useful to investors when it helps them judge the company's future prospects. A truly effective Annual Report must balance quantitative results—last year's financial data—with qualitative considerations of how the company is positioned for the future.

I can report to you that, quantitatively, 1978 was a reasonable year for our Company. We set a new sales record, surpassing $5 billion for the first time. Our net income of $302.6 million, while not a record, was a 9.8 percent increase over 1977. Primary earnings per common share were $8.29 compared with $7.46 for 1977. Fully diluted earnings per common share were $8.21 in 1978 versus $7.37 in 1977.

But I am even more pleased to report on our qualitative progress for 1978. It is clear that Monsanto Company made significant progress in executing strategies that will carry our Company to new earnings records in the 1980s. Quantitative and qualitative progress went hand-in-hand in each of our operating companies during 1978.

- Monsanto Agricultural Products Company again produced strong volume and income gains. The company continues to invest in manufacturing facilities for our fast-growing *Roundup* herbicide, while *Lasso* remains the largest-selling herbicide in the U.S.
- Monsanto Industrial Chemicals, our oldest company, showed its youthful vigor by setting a new record in sales for the eighth straight year.
- Monsanto Textiles Company, still plagued by worldwide industry overcapacity and generally depressed selling prices, nevertheless reduced its losses worldwide and achieved pretax profitability in the U.S. Among the bright spots illustrating sharpened product strategy, Monsanto became the clear U.S. market leader in nylon carpet staple while introducing its new soil-resistant, anti-static *Ultron* carpet staple.
- Monsanto Plastics & Resins Company moved to consolidate and capitalize on exceptional strengths in many of its plastics businesses. For instance, the company is enhancing its competitive position in *Lustran* ABS/SAN—already Monsanto's largest selling plastic—through a new low-cost production process and plant expansions in the U.S. and Europe.
- Monsanto Chemical Intermediates Company moved forward with construction of its joint plant with the Continental Oil Company (Conoco) to make ethylene and co-products at Chocolate Bayou, Texas. The Conoco joint venture will also provide Monsanto with additional feedstock security when our partner completes a new crude processing unit at its Lake Charles, La., refinery.

On the international side, Monsanto's positive contribution to the U.S. balance of trade increased again in 1978, as exports reached $631 million. This is more than double the $296 million we exported in 1974.

Manufacturing operations outside the United States showed improved results, although some problems remain. Operating income abroad rose to $35.7 million in 1978 from $27.4 million the year before. Monsanto continued making capital investments in selected major growth businesses around the world, including *Saflex* plastic interliner in Belgium, rubber chemicals in Wales, and phosphate products in Brazil.

Selectivity in Growth

Through the diversity of Monsanto's businesses, geographical areas, and growth strategies, there runs a common thread. I articulated this at last year's Annual Meeting, referring to it as "selectivity."

Selectivity means that we are streamlining Monsanto to achieve higher levels of profitability in the 1980s. We are selectively building on our strengths, developing more secure raw material bases, and pursuing innovative ideas that should lead to profitable new proprietary products.

But to have the capability to concentrate on strengths, we must trim our weaknesses. To this end, 1978 saw further divestitures and terminations of businesses which did not meet our long-term corporate growth objectives.

U.S. businesses sold during 1978 included high density polyethylene plastics, and the flavors and fragrances group. We moved to divest our Opto-Electronics III-V business (electronic light-emitting materials and devices), and agreement was reached on this early in 1979. We sold our polystyrene plastics business in Europe and, in addition, Monsanto wrote off the remaining assets associated with Olympia Industries, Inc., a specialty knitting operation located in South Carolina.

Some of these businesses, while substantial in sales volume, were only marginally profitable. Others were operating at a loss. More to the point, they offered limited growth potential or, because of cyclicality and other shortcomings,

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simply did not fit our overall corporate plans. They could only distract us from more important and more profitable tasks. Clearly, the human and financial resources formerly devoted to these businesses can be put to better use.

Of course, the streamlining process itself can produce distractions and disruptions. Fortunately, the process is essentially complete for our U.S. operations. A few minor businesses are still being studied for possible divestiture or closing.

In Europe, however, two of our businesses continue to face serious problems and both produced unacceptable losses in 1978—our European nylon operation and our Spanish subsidiary, Aiscondel. In nylon, our plants are not world scale and we have a small share of a relatively stagnant market in Europe. Aiscondel, a company whose product line is primarily related to vinyl plastics, historically was managed and 50 percent owned by Spanish interests. We became two-thirds owner in 1978 to gain management control in an effort to remedy the unsatisfactory business results. Monsanto has initiated programs aimed at resolving both these business problems.

New Fisher Controls Corporation

On a more positive note, the formation of the new Fisher Controls Corporation of Delaware represents an outstanding example of how management is pursuing selectivity—in this case by coupling internal and external resources. Monsanto and The General Electric Company Limited of the United Kingdom (GEC) announced on February 28, 1979, the creation of this self-contained enterprise to serve the worldwide process controls market. It is owned approximately two-thirds by Monsanto and one-third by GEC.

The new corporation combines all operations of Monsanto's Fisher subsidiary (formerly wholly owned) with related units of GEC. The Boards of the two parent companies believe that this combination of resources will not only enhance Fisher's existing leadership in control valve markets, but also make worldwide leadership in electronic and pneumatic instrumentation systems a realistic target. These products are essential to the world's energy and processing industries, including chemicals and petrochemicals, oil and gas production and refining, power, metal processing, and pulp and paper.

Monsanto management recognizes that continued success in the 1980s will require constant reevaluation of our business positions in light of evolving markets and changing technology. We have to expect that some of today's products and processes will be made obsolete by tomorrow's developments. Furthermore, it is our intention that such displacements will be importantly the result of new products and technology introduced by Monsanto—whether developed internally or in conjunction with outside resources. This, too, is part of the overall strategic direction we call "selectivity."

Perspective on 1979

Despite our progress in reducing the cyclicality of our overall portfolio of businesses, we are still heavily influenced by national and world economies. Because of economic uncertainties in the United States and abroad, we do not expect 1979 to be an easy year for Monsanto or the chemical industry as a whole.

If a general economic downturn does occur in the United States this year, it is likely to weaken such key markets as automobiles and housing. This would adversely influence many Monsanto businesses, including industrial chemicals, plastics and textiles.

Let's recognize, however, that the strategy of selectivity has given Monsanto important strengths to help offset adverse economic conditions in 1979 and beyond.

The leadership positions we have achieved in many of our businesses offer a measure of protection. Under unfavorable economic conditions, companies with leading market shares generally fare much better than their competitors with smaller shares.

Our increasing strengths in raw materials and feedstocks will further insulate Monsanto from economic swings; so will our stringent cost-cutting program that includes every Monsanto operation. This continuing success story promises to help maintain profit margins despite a serious cost-price squeeze.

On the strength of technical excellence in our plants and research laboratories, we are moving forward with proprietary new products and processes. This year we will begin large-scale field testing of an innovative technology for separating industrial gases. We foresee a whole new business for Monsanto selling separating equipment to chemical processing and refining plants.

Despite a proper concern for difficult national and international economies in 1979, I believe we should be equally concerned with long-term prospects. Those prospects appear quite favorable. We expect the chemicals and synthetic materials industry to grow an average of 6 percent annually over the next decade. This is substantially better than the past five years and faster than we believe the gross national product will grow. We believe Monsanto is ready to take advantage of those favorable long-term trends.

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Accounting for a Declining Dollar

Again in 1978, Monsanto recorded foreign exchange losses—89 cents per share—due to the U.S. dollar's decline against foreign currencies. The Financial Accounting Standards Board (FASB) Statement No. 8 requires U.S. companies to reflect the impact of changes in currency exchange rates in quarterly and annual earnings reports. Unfortunately, this requirement can distort periodic earnings reports and confuse shareowners because a significant portion of these losses are unrealized.

As Monsanto constructed major production complexes in Europe over the past several decades, sound financial practice dictated that these projects should be financed primarily with long-term debt denominated in the host country's currency. This foreign currency debt is principally payable over the very long term. But FASB Statement No. 8 requires that we reflect this on our balance sheets as if we had to pay this debt off at current exchange rates—which would require more dollars when the U.S. currency is weak.

These are, for the most part, unrealized or "paper" losses rather than real losses. Should the dollar regain its traditional strength, we would have the opportunity to recoup these losses. Either way, we believe that the shareowner gets a distorted picture of the Company's true operating earnings.

To minimize these currency-related distortions, Monsanto has begun major financial hedging through the purchase of forward currency contracts in the British pound sterling, the Belgian franc, and other currencies in which we have significant exposure. We recognize that this involves some real financial risk. But we believe this is a wiser course than leaving Monsanto exposed to the full impact of translation losses as required by FASB Statement No. 8.

The Financial Accounting Standards Board has scheduled a review of all its accounting standards, with Statement No. 8 getting first priority. We applaud this open-mindedness and trust that Statement No. 8 can be modified to allow a more accurate depiction of true operating results while still acknowledging the risk of investing capital outside the U.S. We hope that this change can be implemented in time for reporting 1979 financial results.

Our Greatest Strength

There remains one more qualitative aspect of Monsanto's stance for the future that cannot be overlooked. The people of Monsanto are still its greatest asset and its greatest strength for the future.

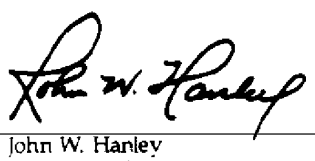
It is particularly appropriate that I express my deep appreciation and that of all Monsanto shareowners to three people on whom the Company has relied for many years. These three Directors will retire from the Board in April.

Two of these Directors are also retiring this spring from active employment with Monsanto. Tom K. Smith, Jr., will leave his post as Senior Vice President-Marketing Coordination after a distinguished career of 40 years. John R. Eck, Senior Vice President-Manufacturing Coordination, will retire with 43 years of highly productive service.

The third retiring Director is Charles H. Sommer, whose 45 years of service includes 20 years on the Board, making him the senior member. His career with Monsanto goes back to 1934. He became President of the Company in 1960 and served as Chairman of the Board from 1968 to 1975. His illustrious leadership has been invaluable in bringing Monsanto to where it is today, poised for substantial advances.

I can think of no better representatives of Monsanto's greatest strength than these three Directors and long-time employees. Their exemplary service reminds us anew of the enormous debt of gratitude we owe the 63,000 men and women around the world whose energies and dedication have lifted Monsanto to new levels of achievement.

Our people are ready for the future. Our objectives are clear. Our strategies are in place. We are anxious to get on with what promises to be among the most exciting eras in Monsanto's history.



John W. Hanley
Chairman of the Board
and President

March 28, 1979

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AGRICULTURAL PRODUCTS

(Dollars in millions)

	Sales	Operating Income	Total Assets
1978	$734.4	$303.8	$629.0
1977	654.0	274.3	579.4
1976	573.2	242.0	463.4
1975	547.4	255.6	347.6
1974	410.7	181.5	283.7

The Monsanto Agricultural Products Company continued its record pace during 1978, recording all-time highs in sales and operating income. Brisk herbicide sales worldwide led the 12 percent growth in sales. Operating income increased 11 percent despite higher operating costs and pricing pressure on nitrogen-based products.

Sales of *Roundup* Herbicide Surge

Increased acceptance of *Roundup* herbicide, Monsanto's newest herbicide product, resulted in substantial sales and income gains for 1978. Strong volume gains in the United States and Europe were bright spots in 1978. New marketing programs generated sizable early-year sales increases and resulted in continued new demand throughout the year. A program initiated during the first quarter in the United States and Canada provided easy customer access to one-gallon containers and generated demand by first-time users.

Roundup is a post-emergent, nonselective herbicide that controls a broad spectrum of problem weeds. It has been registered in the United States for major agricultural cropping systems such as corn, soybeans and small grain crops since late 1975, and it has received wide acceptance by growers. During December 1978, the U.S. Environmental Protection Agency issued new label registrations expanding the use of the herbicide. The sales potential of *Roundup* will be enhanced by the new labels, which include expanded agricultural cropping systems, tree crops, grapes, seed production and minimum tillage systems in the U.S.

Markets for *Roundup* herbicide are international in scope, and during 1978 more than half of all sales were outside the United States. Europe has become an important market with strong demand in France, Italy and Spain for use on vineyards and orchards. It is used on forestry preserves in Scandinavia and has had outstanding growth in the United Kingdom for the treatment of crop stubble. Customer acceptance was also encouraging during 1978 in Asia and Latin America as *Roundup* was in increasing demand for use on plantation crops such as coffee, citrus, sugarcane, rubber and oil palm.

Industrial uses of *Roundup* herbicide were expanded in 1978. Highway authorities in the United States exhibited their preference for *Roundup* as an economical means of controlling noxious weeds along highway systems. New specialty uses for *Roundup* are also being developed, such as for turf renovation and spot weed removal on golf courses.

The selling price of *Roundup* was increased during November 1978, the first increase since the herbicide was introduced in the marketplace in 1975.

Sales of *Lasso* at High Levels

Lasso continued its position as the largest selling herbicide in the United States for control of many grassy weeds, such as barnyardgrass, crabgrass and foxtail found in corn and soybeans. Shipments of *Lasso* herbicides were at high levels in 1978 as farming communities in the United States increased the number of corn and soybean acres treated with herbicides.

Shipments of *Lasso* resumed during December in order to provide adequate supplies of herbicide for the upcoming 1979 season. Selling prices were increased for *Lasso* in liquid form and *Lasso* II in granule form to offset higher costs.

Outside of the United States, *Lasso* had excellent volume growth on soybeans in Brazil and on corn in Europe.

Plans for a manufacturing facility in Brazil were formalized as construction began on a new plant to manufacture *Lasso* herbicide. Construction is expected to be completed in late summer 1979. The facility will also include manufacturing capabilities for *Roundup* herbicide and *Machete* rice herbicide by Monsanto.

Roundup herbicide, Monsanto's newest and fastest growing herbicide for annual and perennial weed control, is being used throughout the world in crops, rubber plantations, vineyards and forestry applications. Its development is supported by extensive research efforts.

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Other Products Score Gains

Sales of *Avadex* herbicide, the principal herbicide for control of wild oats in wheat and small grains and sugar beets, were up substantially in 1978. Good farming conditions and a strong marketing presence enabled Monsanto to gain a greater share of the wheat herbicide market in Canada and the United States. Strong shipment rates were also achieved in Europe.

Shipments of *Machete* rice herbicide were excellent in the Republic of Korea and good growth was achieved in India, Japan and the Philippines. The herbicide controls many grasses in transplanted and directly seeded rice crops.

During 1978, the company continued to broaden the base of sugar mills that use *Polaris* plant growth regulator. *Polaris* increases the sucrose value of sugarcane.

Parathion Sales Off

Several negative influences resulted in an off-volume year for parathion, the insecticide used to control bollworms and boll weevils in cotton crops. Fewer U.S. cotton acres were planted and insect infestation was at lower levels. In addition, there was a shifting pattern to alternate approaches for the control of insects. On the positive side, export sales showed a year-to-year increase.

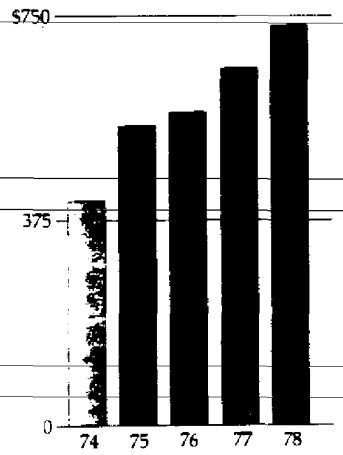
Nitrogen Product Sales Grow

A nationwide coal strike in early 1978, combined with a wet, cold spring, adversely impacted first-half sales of nitrogen-based products including blasting agents and fertilizer. As the year progressed, increased use of fertilizer on pastures in the Southern United States and strong recovery in surface-mined coal enabled the company to record a year-to-year increase in volume sales of nitrogen products. Income from these operations was off on a year-to-year basis because of pricing pressures.

Farmers Hybrid Co., Inc., shipped a record number of hybrid boars, in line with the strong hog market in the U.S. This wholly owned subsidiary of Monsanto markets swine breeding stock through a network of sales centers in the Mid-West.

Farmers in many world areas find that Monsanto herbicides, such as *Lasso* herbicide for corn and soybeans and *Avadex* herbicide for small grain crops, help to control weeds and substantially increase crop yields.

Agriculture Products Net Sales
(Dollars in Millions)



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CHEMICAL INTERMEDIATES

(Dollars in millions)

	Sales	Operating Income	Total Assets
1978	$523.2	$ 75.1	$849.8
1977	522.0	128.0	735.9
1976	498.2	156.7	611.1
1975	426.2	105.9	450.4
1974	443.2	91.8	379.0

Intercompany sales made on a market basis were $116.3, $129.5, $117.2, $100.2 and $104.2 for 1978 through 1974, respectively.

Sales of the Monsanto Chemical Intermediates Company were virtually level with 1977 and operating income was, as expected, off from last year. Excess industry capacity throughout the world continued into 1978, resulting in downward pressure on prices for a good portion of the year. Operating costs continued to rise, resulting in lower profit margins. Prices generally "bottomed" during the third quarter, however, and price increases were announced for several major chemicals during the fourth quarter.

This operating unit of Monsanto manufactures and sells intermediate chemicals that are used as "building block" materials for many industrial and consumer products. It is a major long-term supplier of these chemical materials to the merchant market, and it also supplies many of the raw materials needed for Monsanto's downstream businesses. Approximately one-half of production is sold in the merchant market. The balance is used internally, principally as raw materials in the manufacturing process of Monsanto Plastics & Resins Company, Monsanto Textiles Company and Monsanto Industrial Chemicals Company.

Early in 1979, the production of elemental phosphorus at company locations at Columbia, Tennessee and Soda Springs, Idaho were transferred to Monsanto Chemical Intermediates Company. This action reflects a corporate objective of having this operating unit responsible for basic manufacturing activities. Downstream phosphorus products will continue to be manufactured and marketed by other Monsanto operating companies.

Modest Petrochemical Sales Gains

Sales of a broad range of petrochemicals were up modestly for 1978. There was reasonably good market demand for most petrochemicals as a result of a better-than-expected pace of U.S. economic growth and late-year exports. Significant worldwide overcapacity resulted in pricing pressure in many products, such as acrylonitrile, phenol and styrene monomer, which also faced steadily growing raw material and energy costs. Start-up costs on new plant facilities also continued to be a significant cost factor for this operating unit.

Monsanto is the world's largest producer of acrylonitrile, which is important to several downstream product lines. Acrylonitrile is used to produce nylon fiber intermediates and acrylic fibers such as *Acrilan* acrylic fiber by Monsanto. It is also an important raw material for *Lustran* ABS/SAN plastics. Construction continued on a new 420 million pound plant at Teesside, England, to manufacture acrylonitrile.

Also at Teesside, a new nylon intermediate raw material plant was in final start-up at the end of the year. The plant, a joint venture with the Montefibre subsidiary of Montedison of Italy, produces hexamethylenediamine (HMD), an important raw material for nylon fibers and nylon resin plastics. The new facility is based on the Monsanto-developed electrohydrodimerization process for converting acrylonitrile into adiponitrile, the precursor to HMD.

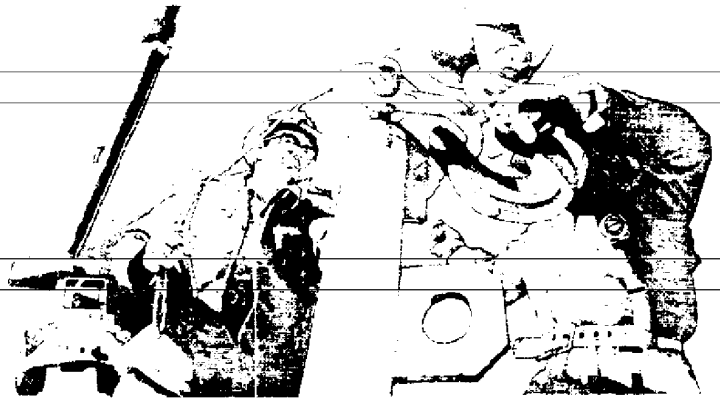
More Expansion Underway

Another expansion aimed at assuring a reliable long-term supply of raw materials and intermediates was in field construction. This joint project with the Continental Oil Company (Conoco) will more than double the ethylene and co-product operations at Monsanto's existing Chocolate Bayou plant near Alvin, Texas, for the mutual benefit

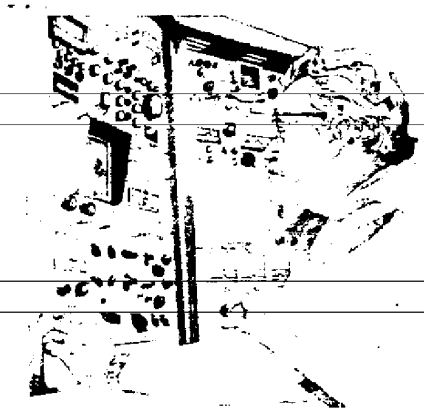
To help assure long-term supplies of raw materials, construction proceeded on schedule to double the size of the Chocolate Bayou plant near Alvin, Texas. The project is a joint venture with the Continental Oil Company.

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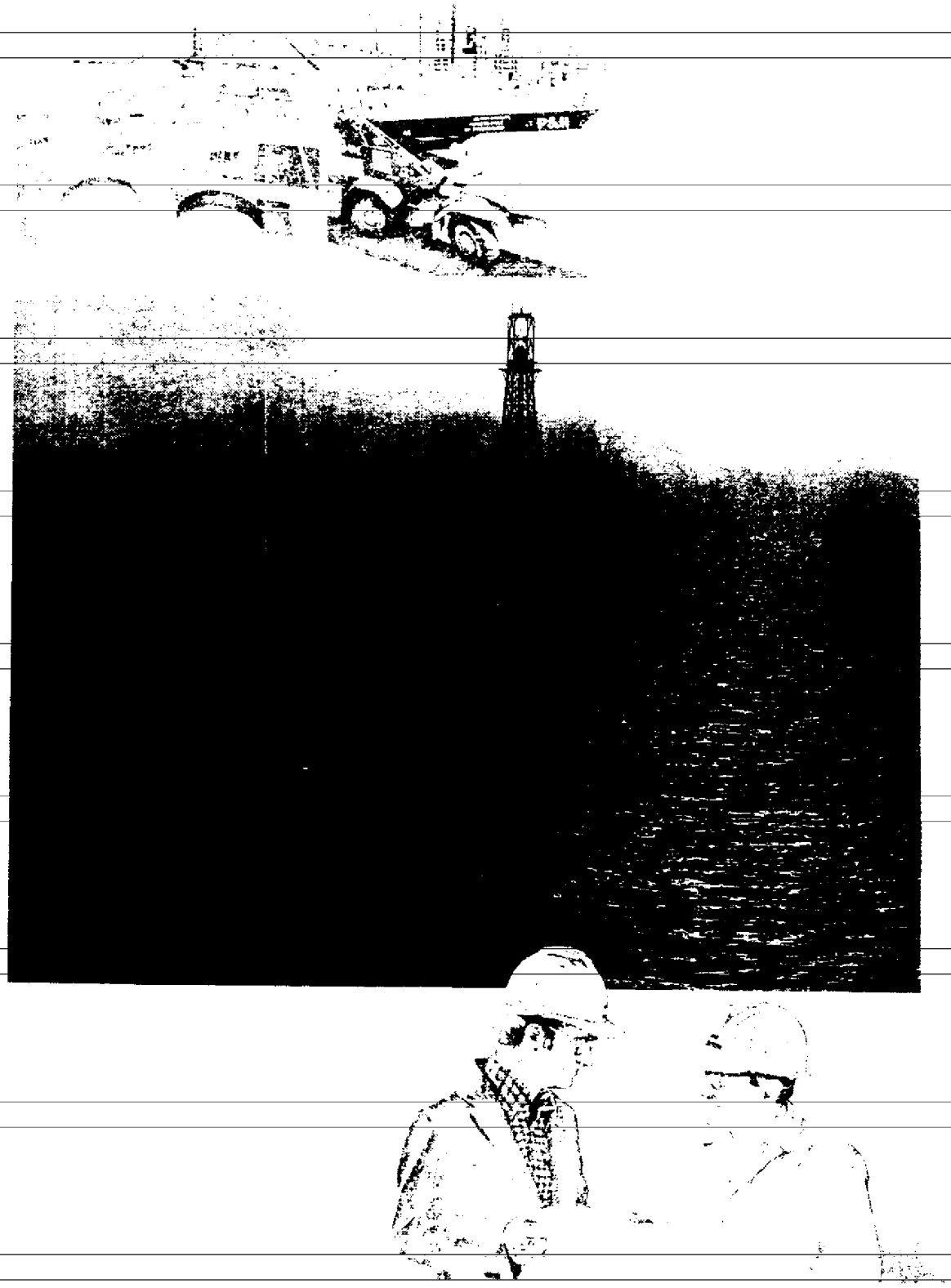








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of both companies. The agreement with Conoco will also provide Monsanto with additional security for feedstock when a new unit at Conoco's Lake Charles, Louisiana, refinery is completed. Feedstock for the new Chocolate Bayou plant will be based on crude oil.

Monsanto's acetic acid technology continues to be licensed extensively throughout the world and represents about 90 percent of the new capacity announced during the last five years. In early 1978, it was announced that Rhone Poulenc Industries, S.A. of Paris, France, was the seventh licensee of Monsanto's acetic acid process. At year-end, an eighth contract was signed with MSK-Methanol and Acetic Acid Complex, Kikinda, for a plant in Yugoslavia. Acetic acid is used as a raw material for diversified products such as man-made fibers, adhesives, paints, solvents, herbicides, food additives and pharmaceuticals.

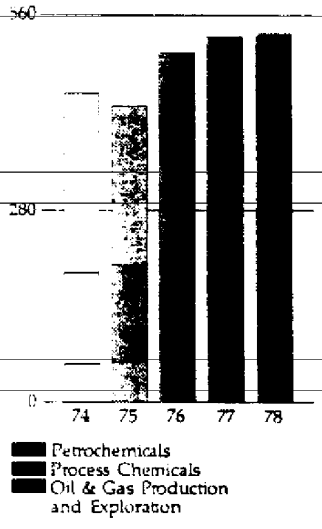
Sales of process chemicals were off modestly from 1977 record levels. The decline in sales resulted from industry excess capacity and pressure on some prices such as maleic anhydride, the principal raw material for polyester resins. Sales of most other process chemicals were strong, including phosphorus intermediate chemicals, chlorobenzenes and industrial acids which serve a broad range of industries including agricultural chemicals, rubber chemicals, oil additives and general chemicals.

Concerted Energy Efforts

Revenues from Monsanto's oil and gas businesses were lower because of sluggish demand for higher priced intrastate natural gas and failure of the Federal Energy Regulatory Commission to approve new connections to interstate systems. While the production and exploration efforts of Monsanto are relatively modest compared with those of major oil companies, they do provide the Company with an important captive source of energy and raw materials. Exploration efforts at year-end were located at off-shore and on-shore Texas locations as well as at sites in New Mexico, Wyoming and Oklahoma. Efforts are also under way in Canada, the North Sea, Java Sea and Guatemala.

In another energy-related development, Monsanto in 1978 was exploring the feasibility of energy co-generation which could lead to more efficient, and more secure utilities for manufacturing operations. Plans for a large coal-fired generation plant in Texas City, Texas, to produce both steam and electricity are being developed by Monsanto, Union Carbide and Amoco. Combining the production of steam needed for refinery and chemical processes with electric generation in a large plant achieves about twice the fuel efficiency compared with the fuel efficiency factor for a plant generating only electricity.

Chemical Intermediates Net Sales
(Dollars in Millions)



Monsanto continued its oil and gas exploration activities to provide captive sources of raw materials and energy. Exploration efforts were under way at off-shore and on-shore Texas locations as well as in other U.S., Canadian, North Sea, Java Sea and Guatemalan locations.

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INDUSTRIAL CHEMICALS

(Dollars in millions)

	Sales	Operating Income	Total Assets
1978	$1,290.1	$218.7	$849.6
1977	1,156.4	211.9	750.3
1976	1,108.6	220.1	651.9
1975	948.6	186.9	572.7
1974	925.1	151.4	514.7

Intercompany sales made on a market basis were $26.6, $24.0, $22.9, $19.6 and $19.1 for 1978 through 1974, respectively.

For the eighth consecutive year, Monsanto Industrial Chemicals Company set a new sales record, showing strong growth across most product lines. Sales for 1978 increased by 12 percent over 1977. Operating income was up 3 percent over the preceding year. Higher manufacturing costs, including the start-up of new facilities, moderated the increase in operating income.

Phosphates Business Improves

Sales of detergent and phosphate products increased 12 percent for 1978 as several product lines made gains. Monsanto increased its market penetration in sodium tripolyphosphate which is the industry's leading builder for most brands of detergents. Looking to the future, however, detergent raw materials are generally expected to have moderate growth based upon slower population growth and as a result of legislation in some states that limit or eliminate the use of phosphates in detergents.

Monsanto's sales of linear alkylbenzene, the largest volume detergent surfactant, increased over 1977 levels despite reduced raw material availability in the last half of the year.

The Canadian demand for sodium nitrilotriacetate (NTA) was strong throughout the year. NTA is a nonphosphate detergent builder that has experienced excellent acceptance by consumers in Canada.

Operating results in Brazil were important to the income performance of the phosphates product line. Facilities for the production of phosphoric acid and various phosphate salts, originally completed in mid-1976, achieved significant volume and profit gains over 1977.

Production of TCC bacteriostatic agent was expanded by nearly 25 percent during 1978. The increased capacity enables Monsanto to meet expected increases in worldwide demand for TCC, used exclusively in bar soap.

Another Good Year for Specialty Chemicals

Demand was strong for the broad range of specialty chemicals produced by Monsanto and a number of expansions were implemented to strengthen Monsanto's market position.

Plants for the production of ACL sanitizer and bleaching compounds operated above design capacities, setting new records in 1978. The company emphasized its dedication to the cyanurate market by announcing expansions at Sauget, Illinois, and Luling, Louisiana.

Dequest phosphonates, used primarily in industrial water conditioning, registered another record volume year. Investments to significantly improve operations and reduce costs at Everett, Massachusetts, neared completion in 1978.

Monsanto became the second largest producer of acetaminophen, APAP, with start-up of a new plant at Luling, Louisiana, in 1978. The acetaminophen process is integrated back to basic hydrocarbon raw materials. This product complements Monsanto's leadership position in aspirin and strengthens Monsanto as the world's leading analgesic producer.

During December 1978, Monsanto completed the sale of the assets of the flavor, fragrances and essential oil business of its wholly owned subsidiary, Monsanto Flavor/Essence, Inc. The sale of this business is part of Monsanto's program of withdrawing from operations that no longer fit in with long-term corporate growth objectives.

Strong Demand for Rubber Chemicals

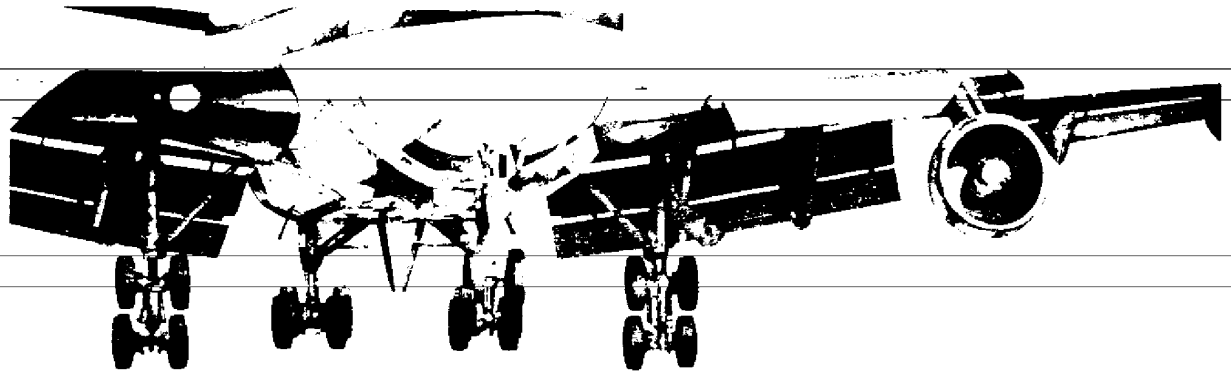
Monsanto is a major worldwide supplier of chemicals used for processing natural and synthetic rubber. More than half of the sales are outside the United States.

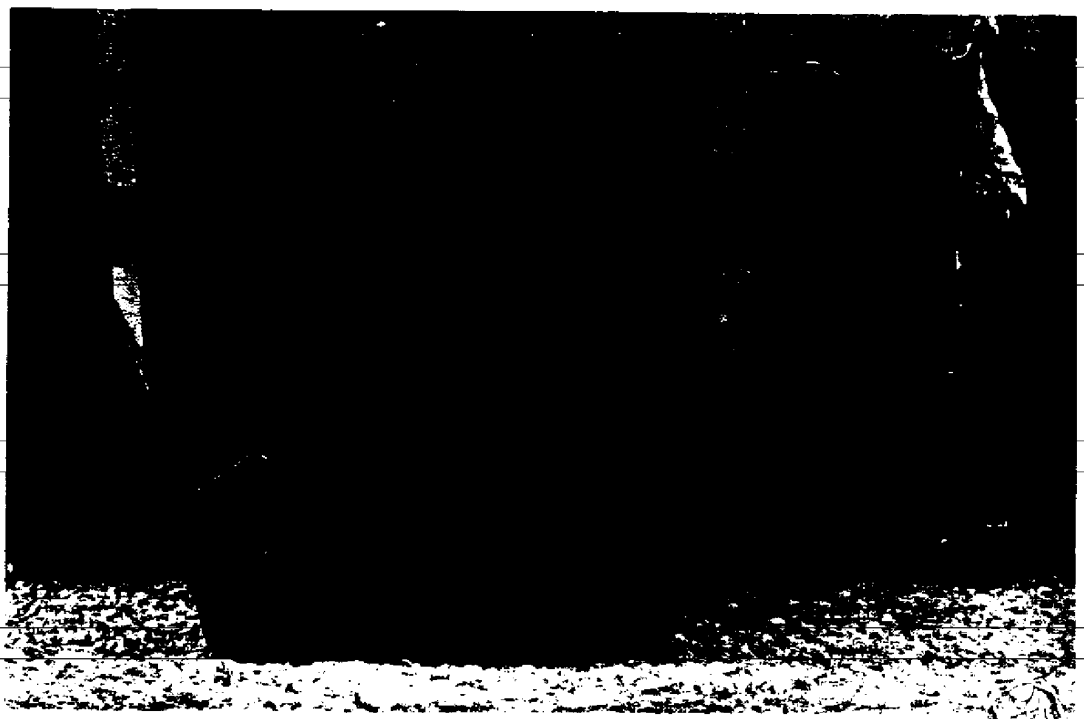
Rubber chemical sales for the year were comfortably higher than a year ago, up 12 percent. Car makers achieved their third-best year ever in 1978. Consequently, strong production of automobiles around the world increased demand for all Monsanto products. Exports to Eastern Europe were one of

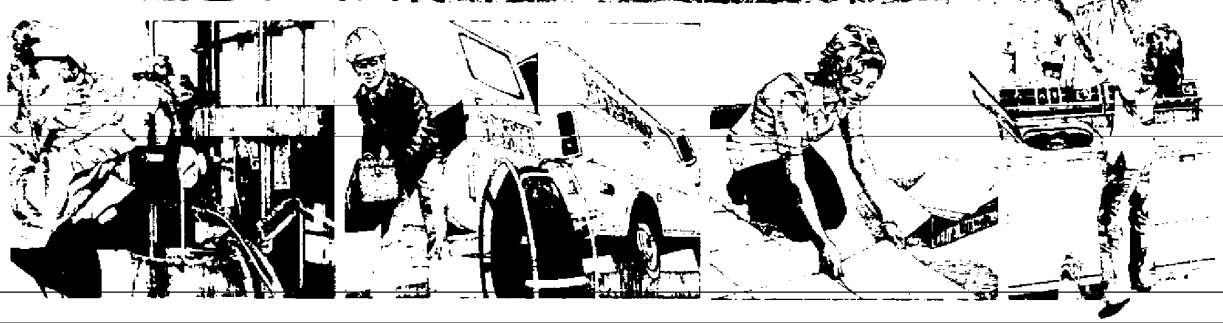
Chemicals and testing equipment from Monsanto aid in the production and add to the long life of tires while plasticizers impart flexibility to plastics for flooring and electrical cable insulation. Products for the detergents industry help make clothes cleaner.

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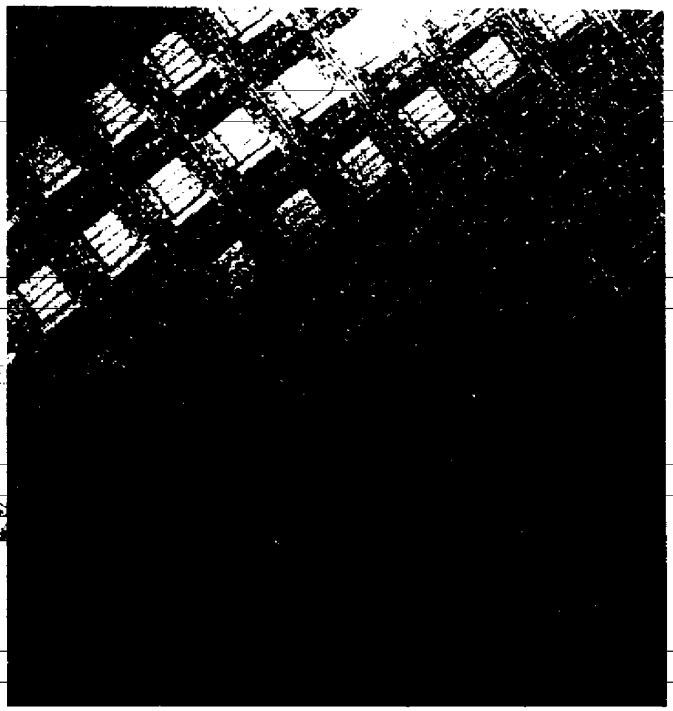






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several bright spots for rubber chemicals during 1978.

Monsanto's line of rubber equipment and precision testing instruments for improved quality control have experienced a high rate of acceptance by the rubber and tire industry. New x-ray testing equipment for auto and truck tires is gaining importance in the industry.

Rubber chemicals are important ingredients in the production of faster-growing industrial rubber products such as conveyor belts, hoses, gaskets and belting. The new *Santoweb* composite fibers of Monsanto allow use of cellulosic fibers in industrial rubber products providing the manufacturer with increased stiffness and other desirable properties in rubber compounds.

Plasticizer Sales Set Record

Worldwide plasticizer sales for 1978 were up 12 percent over those for the previous year. Capacity for high performance *Santicizer* 160 plasticizer, a product which provides especially useful properties in the manufacture of vinyl flooring, was expanded with the start-up of a new plant in the United States. The plant increased Monsanto's capacity by over 40 percent. Market penetration was achieved during the year, not only in the flooring market, but in a number of non-flooring applications, including adhesives and sealants.

During the year, construction began on a new plant for *Santicizer* 160 in Brazil. Plant completion is expected in the fourth quarter of 1979.

Strong demand for *Santicizer* 711 general purpose plasticizer resulted from growth in the automotive and housing industries. *Santicizer* 711 is used for vinyl upholstery in automobiles and in a variety of wire and cable applications essentially tied to new construction.

Silicon Sales Set Record

Sales of high purity single crystal silicon rod and polished wafer products for the electronics industry were at record levels in 1978. Demand pushed plant operating rates to capacity.

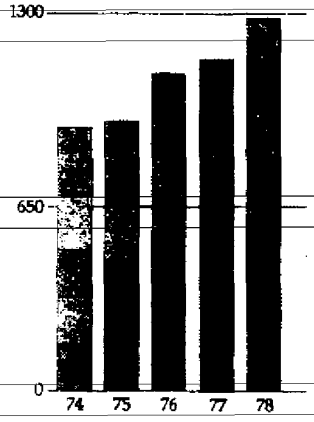
The second phase of a major multi-million dollar expansion and cost reduction program is scheduled for completion late in 1979, reinforcing the company's commitment to meet the growing requirements of the electronic components industry. Silicon is a major product line for Monsanto and the company intends to continue to invest heavily in technology and equipment. A second plant site in the United States, as well as another major expansion at an existing plant, are being planned.

Acting on the plan to divest the Optoelectronics and III-V Materials businesses, agreement in principle was reached at year end with the purchaser of these businesses.

Enviro-Chem Sales Decline

Construction of sulfuric acid plants from prior year awards to wholly owned Monsanto Enviro-Chem Systems, Inc., was successful and rewarding in spite of lower sales in 1978. Active bidding in 1978 on the limited number of industry awards resulted in a highly successful level of five new projects for construction by Enviro-Chem over the next two years. Sales of vanadium catalyst for sulfuric acid plants was excellent and sales of mist eliminator systems to control air pollution and to improve process operations continued strong during 1978.

Industrial Chemicals Net Sales
(Dollars in Millions)



Monsanto is a major producer of silicon chips for the electronics industry (photo), an increasingly important business area. Monsanto's specialty chemicals sanitize and condition water, protect foods and provide analgesic relief compounds.

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PLASTICS & RESINS

(Dollars in millions)

	Sales	Operating Income	Total Assets
1978	$1,223.6	$ 57.6	$1,088.2
1977	1,111.2	76.3	891.9
1976	1,018.7	100.8	752.9
1975	768.3	41.9	677.9
1974	812.6	99.0	625.1

Worldwide sales of the Monsanto Plastics & Resins Company increased 10 percent in 1978. However, operating income outside of the United States declined primarily due to operating losses and write-offs associated with Aiscondel, Monsanto's majority-owned Spanish subsidiary whose financial results are consolidated with the Plastics & Resins Company. Income from operations in the United States and from export sales increased significantly over 1977 levels.

Record Demand for Plastics

Industry production of plastics and resins broke all records in 1978 in the United States. Stronger economic conditions led to increased demand for a number of plastics and resins by the construction, durable goods and the automotive sectors of the economy. These markets consume nearly two-thirds of the output of the Monsanto Plastics & Resins Company. Around the world, overcapacity continued in certain portions of the thermoplastic industry resulting in a cost/price squeeze for most manufacturers.

Monsanto's largest selling plastic product, *Lustran* ABS and SAN plastics, completed another record year. Major markets for ABS plastics are automotive, major household appliances (particularly refrigerators), and pipe and fittings used in residential and commercial construction.

Monsanto is a leader in the production of ABS/SAN plastics. This position was enhanced during 1978 with process and product innovations and new plant expansions in the United States and Europe.

Bright Developments for *Lustran*

Monsanto has a favorable cost position as the only producer of ABS/SAN with in-house production of the three principal raw materials—acrylonitrile, butadiene and styrene. This favorable position will be enhanced in the future as a new low-cost process for the production of *Lustran* ABS is commercialized. The process offers lower capital equipment requirements, reduced energy and labor cost and lower manufacturing conversion costs. The new process will continue to ensure that ABS materials produced by Monsanto remain price and performance competitive with other thermoplastics.

On the new product front, three recently introduced grades of *Lustran* ABS plastics have opened new markets for Monsanto, including dashboard panels in buses and trucks and air conditioning units in recreational vehicles.

Continuing with plans to be the low-cost producer of ABS/SAN plastics and the leader in the industry, the company brought on stream an additional 50 million pounds of capacity at Antwerp, Belgium, and 100 million pounds of capacity in the United States during 1978. In addition, construction continues on an additional 50 million pounds of capacity at Antwerp. Upon completion of the European expansion, Monsanto's annual worldwide capacity of *Lustran* will exceed one billion pounds.

Record Year for *Saflex*

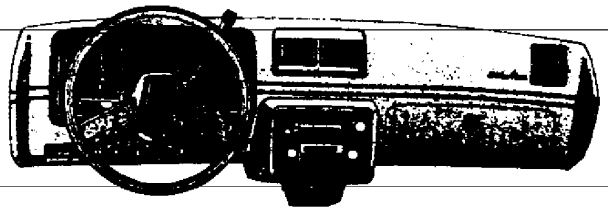
Saflex plastic interlayer enjoyed another record year worldwide. The polyvinyl butyral interlayer is used primarily in laminated safety glass for automobile windshields and in laminated architectural glass applications.

Automotive demand remained strong throughout the year for *Saflex* and good growth in laminated architectural uses in commercial construction resulted in high plant utilization rates. The approximate doubling of capacity at Ghent, Belgium, will enable Monsanto to maintain its strong market position in this important product line and better serve the growing Europe-Africa market.

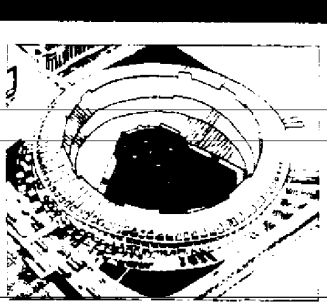
Weight reduction in the automotive industry and design and engineering requirements in the appliance industry have led to increased sales of *Lustran* ABS plastics and *Vydyne* nylon resins. *AstroTurf* artificial surfaces for stadia and other applications continue to be

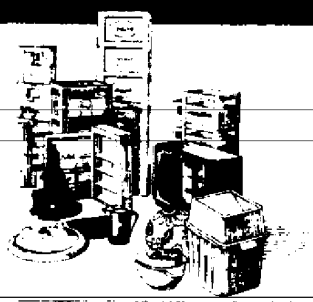
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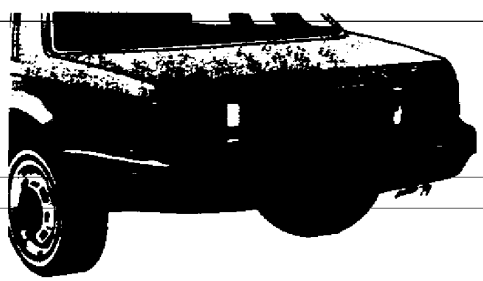
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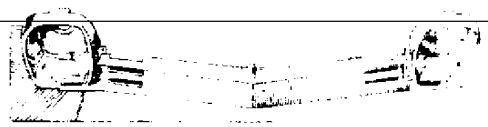




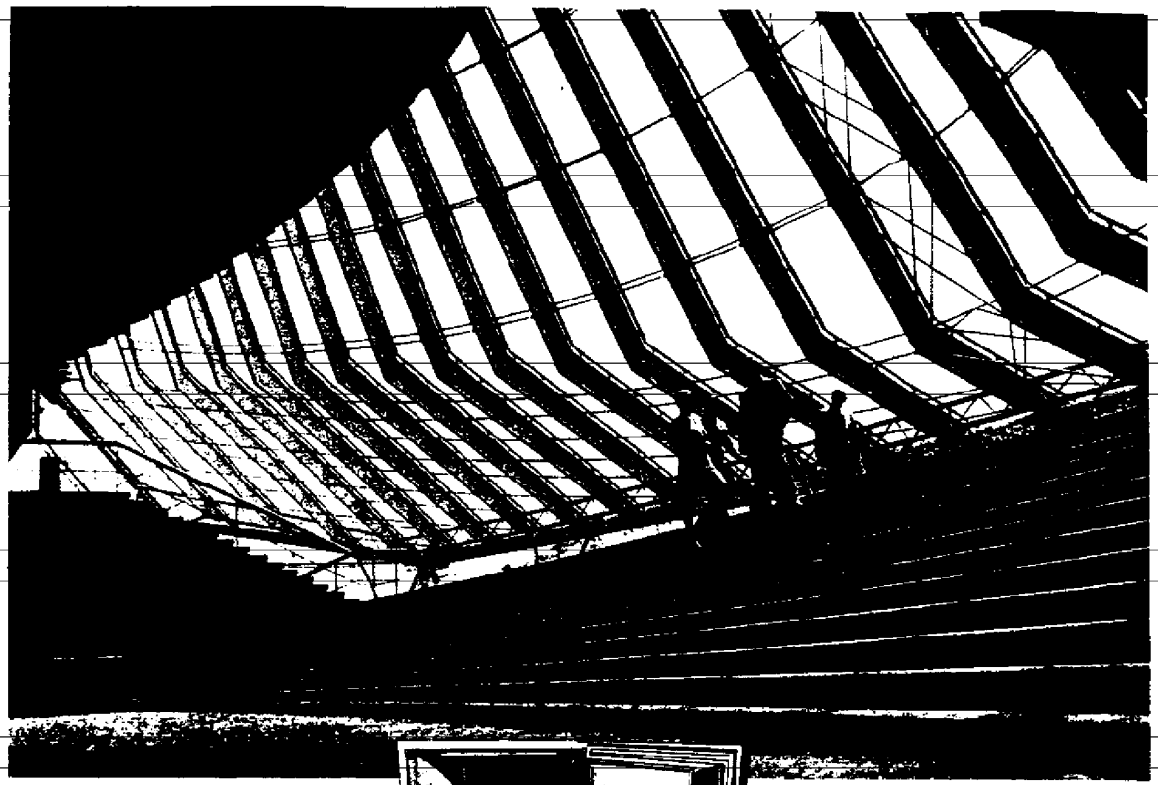


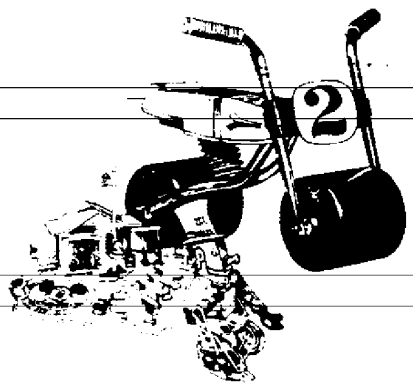


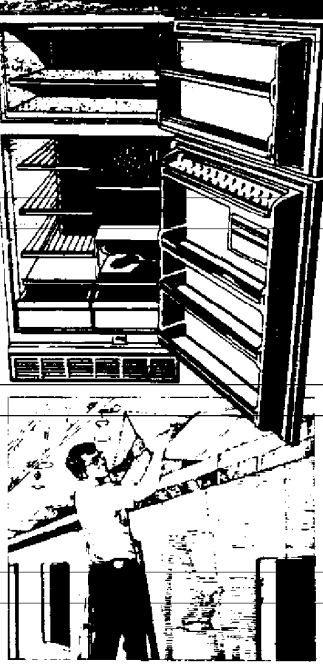


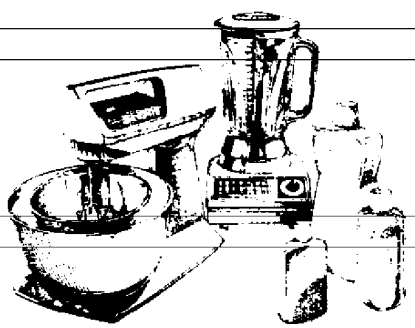


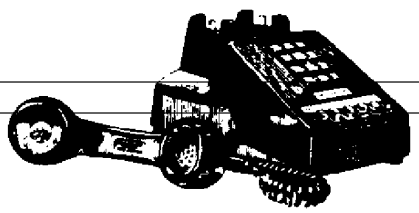
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Fome-Cor Offers Energy Savings

Fome-Cor board by Monsanto had another strong sales performance in 1978. *Fome-Cor* is a lightweight rigid board of expandable polystyrene foam bonded between two layers of kraft liner board. Its major uses are as headliners in automobiles, sheathing in manufactured housing and re-siding underlayment in the home improvement market. The insulation characteristics of *Fome-Cor* sheathing board and the resultant savings in energy is an added advantage for use in the manufactured housing industry and home improvement market.

New Products of *Vydyne* Nylon Introduced

Two new products of *Vydyne* nylon resin, modified with fire retardant additives to assist customers in meeting flammability specifications, were introduced during the year. They are aimed at growing electrical and appliance applications. Monsanto's family of *Vydyne* nylon resin has major applications in the automotive, industrial machine, appliance and electrical industries.

Polystyrene Sales Grow

Shipments of *Lustrex* polystyrene plastics were modestly higher in 1978. However, excess industry capacity continued to keep selling prices low and impede satisfactory levels of profitability. During 1978, Monsanto completed the sale of its polystyrene and expandable polystyrene businesses in Europe to BP Chemicals, a wholly owned subsidiary of the British Petroleum Company. The future for Monsanto in polystyrene was not attractive because, in Europe, Monsanto was not fully integrated into the basic raw materials. The company will continue its long-term commitment to polystyrene in the United States and other world areas, where it has a strong raw material and market position.

In a related effort to concentrate on strength in plastics businesses, such as *Lustran* ABS/SAN plastics and *Vydyne* nylon resins, Monsanto sold its high density polyethylene business to Cities Service Company. This step was based on the Company's earlier strategic decision that the polyethylene business did not represent an area of long-term growth for Monsanto.

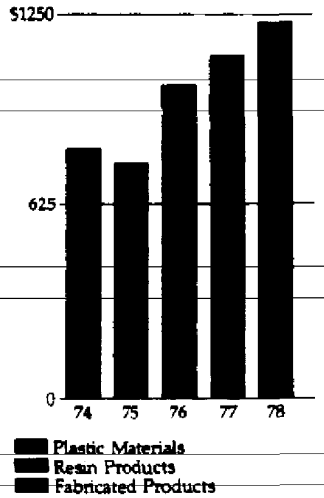
New Fabricated Plastic Products

Sales of the various fabricated plastic products manufactured by Monsanto also improved in 1978. Shipments of polyethylene film grew as the film gained recognition as an energy efficient insulation material for glass agricultural greenhouses.

A major new market for *AstroTurf* artificial surfaces is developing with schools and communities in urban areas where there is little land for recreational services. As an example, the City of New York is surfacing five fields with *AstroTurf*, one in each borough. During November, Monsanto completed the first of the five installations at Midwood High School in Brooklyn.

A new product of Monsanto, *Spray Guard* mud flaps, has been road tested in the United States and Europe. This product appears to be the most cost effective system of improving visibility for safer driving on wet surfaces by controlling splash and spray problems.

Plastic & Resins Net Sales
(Dollars in Millions)



Tough, resilient and optically excellent interlayers of *Saflex* polyvinyl butyral sheet in architectural glass allowed designers of the Sydney, Australia opera house to install wide expanses of windows. Monsanto's *Lustrex* polystyrene plastics and Monsanto resins are used extensively by the home building, appliance and packaging industries.

DSM 021162

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TEXTILES

(Dollars in millions)

	Sales	Operating Income	Total Assets
1978	$963.2	$(29.2)	$1,050.1
1977	884.3	(39.0)	1,011.2
1976	853.5	(1.2)	947.5
1975	747.2	(12.7)	812.2
1974	770.0	77.1	684.0

For 1978, Monsanto Textiles Company recorded a sales gain of nine percent over 1977 levels. In the United States, exclusive of the Olympia Industries asset write-off, operations were profitable. In Europe, however, substantial losses were recorded.

While 1978 was a year in which industry overcapacity and depressed selling prices continued to impact Monsanto, particularly in Europe, measurable progress was achieved in several important areas—all directed toward a future earnings turnaround.

Innovative new fibers were introduced during the year and these met with excellent consumer acceptance. Selective reductions were made in the existing product line and resources redirected toward areas of proven strengths. Technological advances were implemented in process and production activities resulting in cost reductions.

Consistent with Monsanto's policy of selectively withdrawing from those areas not meeting corporate growth objectives, the assets of Olympia Industries, Inc. were written off and its Spartanburg, South Carolina plant was closed. Olympia had been in a loss position in recent years.

U.S. Fiber Operations

The strength of the U.S. economy, particularly residential and commercial construction, led to strong sales gains for nylon products for the carpeting and home furnishings markets. Sales volumes for nylon, acrylic and polyester fibers serving the apparel industry also improved on a year-to-year basis.

Nylon Sales Brisk

Monsanto, the second largest supplier of nylon in the United States, has world-scale plants, modern technology and a strong raw material position. The nylon business area is fully supported with human and capital resources and has been consistently profitable but not at levels necessary for reinvestment.

Strategic decisions implemented prior to 1978 to position Monsanto as a major supplier of nylon staple and filament to the carpet industry resulted in significant sales gains during the year.

Using additional nylon staple capacity made possible through previous, low-cost capacity increases, Monsanto became the clear market leader of this preferred carpet fiber, growing significantly faster than the industry. During the year, a number of new products, including *Ultron* nylon staple, received excellent acceptance from Monsanto's direct customers—the carpet producers—as well as the ultimate consumer. *Ultron* nylon is an advanced generation fiber that incorporates soil-resistance and anti-static features.

The company maintained its substantial market share position for nylon filament sold to the tire industry primarily for applications in off-the-road tires used in construction and mining.

Adding to its strength as a major supplier of nylon carpet filament, another new product, *Ultron* nylon filament for residential markets was commercialized late in the year and early reports indicate strong consumer acceptance. Also in the new product area, an undrawn hosiery feeder yarn was introduced for the apparel market.

In total, nylon volume set a new record for Monsanto in the United States primarily due to the success of nylon carpet staple. Manufacturing utilization rates were high and modest price increases were implemented in all segments of the nylon business.

Polyester Sales Improve

Polyester filament, because of its easy care characteristics and its system cost advantages to apparel producers, continued to gain importance in United States' markets. Demand increased steadily throughout the year as consumers purchased knit and woven fabrics made from non-glitter and lighter weight polyester fibers.

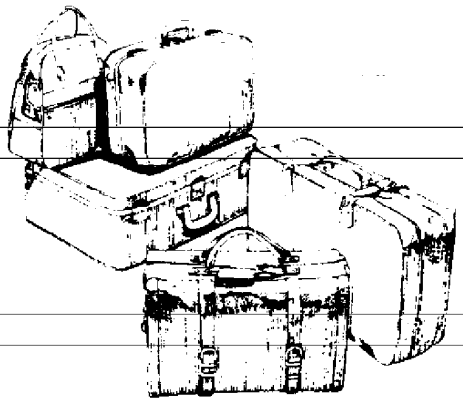
Although industry, as well as Monsanto volume sales, increased significantly on a year-to-year basis, supply continued to outstrip demand resulting in severely depressed selling prices for polyester filament.

Elegance and easy care are important characteristics of Monsanto's polyester filament products for the apparel industry. The production of these and other fibers, such as *Acrilan* acrylic fiber for home furnishings and for luggage, are supported by extensive research and development programs.

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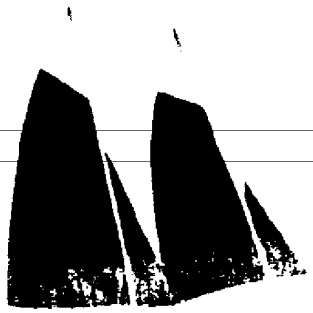


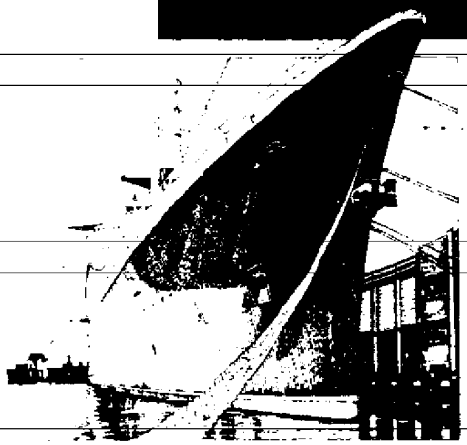




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Monsanto successfully developed and commercialized an anti-glitter polyester filament during the year. Acceptance of the new fiber by major apparel manufacturers positions Monsanto to supply fiber for the higher fashion fabrics now preferred by consumers.

Start-up of Monsanto's Fayetteville, North Carolina plant, purchased late in 1977, proceeded smoothly. The plant, doubling Monsanto's polyester filament capacity, has allowed the company to strengthen its position in this growing fiber area.

Acrylic Sales Grow

Monsanto has the world's largest capacity for acrylic fibers with significant potential for low-cost additional capacity. In addition, the company is the largest worldwide producer of raw materials for acrylics. During 1978, capital investments and technological efforts were directed toward cost reductions and product improvements.

In the United States, demand for *Acrilan* acrylic fiber improved for applications in pile liners, blankets and home furnishings. Strong export sales were an additional, important factor to increased sales volumes.

Increasingly, acrylics are finding applications in sweater markets and this demand is expected to grow in the future. To meet this growth, a new acrylic fiber was introduced, high bulk *Bi-Loft* acrylic fiber.

European Results Improved

The operational results of Monsanto's nylon and acrylic plants in Europe improved during 1978 as a result of moderate economic growth and consolidation actions implemented by Monsanto in 1977. The chronic supply-demand imbalance, rising costs and high garment imports resulted in unacceptable fiber prices and consequently, while European operations improved, a significant loss was recorded.

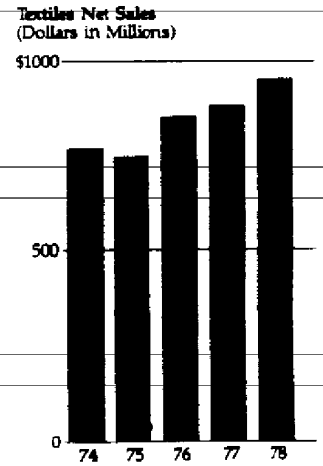
Monsanto, in its European acrylic business, enjoys a strong market position with recognized quality acrylic tow products. Its plants are world-scale and employ the most modern technology. Its raw material position is excellent and the company has an important share of the acrylic market.

During 1978, shipments of *Acrilan* acrylic fibers were up marginally over 1977 levels and prices improved during the year. The acrylic knitware business continued strong throughout 1978, and as a result, the acrylics' operations were nearing a break-even point at year-end.

The company's nylon position in Europe is not as significant as its acrylic position. Its plants are relatively small and its share of the European nylon fiber market is not large. For 1978, nylon fiber shipments were level with those of 1977. While there was some selling price improvement, it was not nearly enough to result in any meaningful improvement in the operating loss reported by this business segment.

Bidim Nears Commercialization

Considerable effort was directed toward the commercialization of a new, non-woven polyester filament product to serve the civil engineering field. *Bidim*, a heavy duty fabric is being used in road building, earthen dams, railroads and drainage systems. The fabric distributes the load and prevents fine silt from contaminating the ballast of the road bed. In asphalt paving systems, *Bidim* fabric reinforces the asphalt overlay to help eliminate cracks caused during the freeze/thaw cycles many roads go through each year. Prospects for future sales are bright.



Monsanto's new and exciting *Ultron* nylon products recorded major gains and provided soil-resistance and anti-static features for the carpet industry. Nylon sales for industrial and leisure applications grew in volume while *Bidim* engineering fabric, a non-woven polyester filament product, neared commercialization.

DSW 021166

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RESEARCH AND DEVELOPMENT

For Monsanto, as for any company, research and development is a delicate gamble, with the whole future riding on the assurance that each investigation — regardless of its eventual success — will contribute to the bank of knowledge from which new products are born. Of the multitude of research projects which are instituted every year, most will not be able to meet Monsanto's exacting standards for consumer or environmental acceptability, and will be discontinued. Others will not be commercialized simply because they do not fit with existing product lines, or because, ultimately, they are not compatible with Monsanto's long range plans.

Every year, growing awareness of the environment and human health causes researchers to take closer looks at fledgling projects. Dozens of tests are conducted for health and safety; dozens more for economy of production. During 1978, Monsanto continued a systematic study of the long-term value of existing businesses to the Company. This is an unending process in the research laboratory, where it is possible for as many as 10,000 potential chemicals to be considered before a new pesticide is born. It is not unusual for a new product to be 10 to 20 years in the making.

In an effort to bring more balance in the research and development picture, Monsanto's research is divided into three broad areas. Efforts to develop new products related to the existing Monsanto portfolio are underway in the operating unit research laboratories. Longer-term research with potential for providing whole new business areas is funded through the Corporate Research and Development Staff. Underlying all product investigations, however, is basic research in the physical and process sciences to provide Monsanto scientists with the know-how to analyze, measure and characterize the results from each step along the path, from laboratory to marketplace.

In 1978, Monsanto total research and development efforts included about 2500 professional people, working both in the laboratories and in related process technology areas. Expenditures totalled $144.3 million.

During the past year, several important research projects were brought to fruition across the Company. Among these is a new generation of nylon carpet fiber, and successful application of non-woven polyester fabric for engineering uses. A new generation of ABS plastic was developed which extends Monsanto's broad base of technology in this important line. Technological developments were evidenced in electronics and specialty chemicals, and a proprietary short-fiber reinforcing material was introduced in the rubber chemicals market.

Ongoing research projects in the operating companies are involved with such things as studies to discover new properties for non-woven synthetic fabrics — which are expected to have major apparel applications in the 1990s and beyond. Agricultural research scientists continue to investigate the possibilities of plant growth regulators for major crops. Cell biology is also under investigation as a possible answer to the agricultural production problems of the future.

Concurrently, long-range research which has little to do with today's products or business groups is nurtured within the Corporate Research and Development Staff. As part of this organization, a New Ventures Development group provides Monsanto with an additional "window on technology" to evaluate new ideas and new research concepts which would have even longer range applications.

During the 1980s, part of Monsanto's thrust in research and development will be into biochemistry and the biological sciences as well as chemistry.

The growing BioMed program has several projects underway, all of which are many years from commercialization. These include the unprecedented Harvard Project, in which a joint team of researchers from Monsanto and Harvard are investigating the molecular basis of organ and tissue development. Other biomedical research projects are involved with a hypocholesteremic drug, cancer diagnostics, investigation of biopolymers for medical uses and exploratory chemotherapy.

The increasing value of energy has opened new areas of investigation and opportunity for Monsanto researchers. Teams of scientists are continually searching for new processes which will enhance Monsanto's energy capabilities within our manufacturing plants. Other researchers at Monsanto Research Corporation's Mound Laboratory are launched on government-funded investigations into various energy sources.

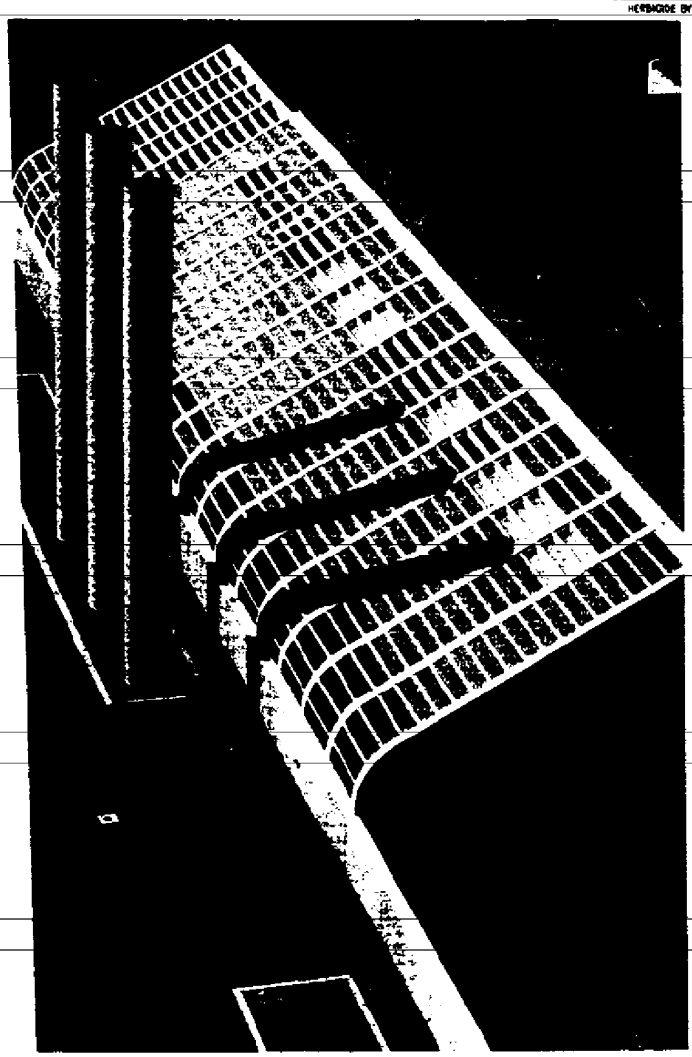
Monsanto is doing everything possible to assure a full complement of new products, new processes and new business areas for the world of the 1980s, 1990s and beyond.

A broad range of proprietary products have emerged from Monsanto's extensive research and development programs. Existing and emerging products will now be tested in a new $12 million laboratory in St. Louis. In prior years, this work was carried on by specialists outside of the Company.

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Santogard PVI
Polaris
Monsanto
WEAR DATED
SANTICIZER711
Monsanto
Machete
DEQUEST PHOS-CHEK
SAFLEX
ACL
Round
Far-go
ACRILAN
ULTRON
Avadex BW

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SOCIAL RESPONSIBILITY

Monsanto instituted a variety of measures during 1978 to reaffirm its commitment to broad social responsibility objectives which help guide the Company in its relationship with its employees, plant communities and with society at large.

The thrust of these measures is to assimilate social responsibility objectives into the day-to-day working life of all units of Monsanto. Significant progress was made in the past year in shaping the internal environment so that social responsibility is a part of the daily fabric of business life.

The Environment

Safeguarding the health of Monsanto employees and protecting the environment in plant communities continued to command considerable Monsanto human and financial resources.

Environmental standards establish precise on-going operating guidelines, and formed the basis for the unit-by-unit evaluation of effluents and emissions in Monsanto plants worldwide.

Disposal of solid wastes, an issue of considerable national attention, is closely regulated in Monsanto, both at disposal sites under direct Company control and at independent site operations. Where private contractors are used, Monsanto carefully monitors handling practices so that the appropriate environmental standards are observed.

Workplace Safety

The workplace environment likewise is being monitored under stringent rules of proper industrial hygiene practice. In 1978, Monsanto made major strides forward in constructing, what is generally acknowledged to be, one of the most far-reaching industrial health monitoring systems in existence. Using sophisticated Monsanto-developed computer programs, the Company now has the ability to closely monitor the workplace environment and employee health experience. The system will, in effect, medically track an employee through his or her entire career, helping to assure an early alert to any hazard that could have an adverse health effect.

Consistent with this exacting worker safety program, the Company's established policy guidelines help to ensure that female employees of childbearing ages will not be exposed in the workplace to any hazard to the human fetus. Monsanto believes this policy not only protects the health of certain female employees but also can be implemented in ways that carefully ensure equal job opportunities and pay for women.

For many years, Monsanto's product line has been subjected to extensive testing procedures to assure their safe production and use. Until 1978, most of this testing was conducted by professional laboratories outside of the Company.

To further ensure the safety of Monsanto products, the Company began operation of its new $12 million Environmental Health Laboratory in St. Louis in 1978. A staff of trained toxicologists are now testing the medical and environmental effect of Company products, raw materials and chemical intermediates. The laboratory itself meets another social goal. Built in a redevelopment area of St. Louis in the midst of the city's principal medical center, it features one of the nation's largest industrial-use solar collection systems to serve the laboratory's energy needs.

Community Support

Support of a broad range of community programs at Monsanto locations around the United States increased during 1978 in number and in dollar amounts. These programs are administered through the Monsanto Fund, the Company's philanthropic arm, and amounted to $4.8 million in 1978. This level of contributions, augmented by $900,000 from corporate funds, exceeds the national average of donations by industrial funds to wide-ranging educational, cultural and health and welfare efforts.

Education received the largest share of Fund contributions, rising to more than $2 million and representing a 70 percent increase over 1977. Grants were made principally to higher education in the form of unrestricted support of colleges and universities, a toxicology fellowship program, selected support of specific departments within colleges and universities and a program matching gifts of employees.

United Way Supported

There was an 11 percent increase in donations to 110 United Way organizations in communities where Monsanto employees live and work. Cultural programs receiving Fund contributions included donations to public television, art museums and other cultural institutions.

Monsanto's commitment to social responsibility is evidenced in many ways—from providing funds for a theatre renovation to house such activities as this orchestra in Pensacola, Florida, to a Science Fair in St. Louis. Through a Chemical Facts of Life program, the Company attempts to stimulate responsible discussion of public issues involving chemicals.

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Educational support was selectively broadened to include grants to upgrade the quality of secondary education. More than 100 modest "seed money" contributions went to various community programs in the arts, health, youth activities as well as education.

Equal Employment Opportunity

Enhanced opportunities for minorities and females at Monsanto was another social objective where marked progress was recorded during the year. Still more progress is required in the Company and in the nation before these groups reach their fullest potential.

Minorities and women now constitute 6.3 percent of all employees in managerial positions throughout the Company. This represents a sixfold increase in the past five years. Another measure of progress in attaining key business positions for minorities and females is that they now represent 16 percent of Monsanto's total professional workforce. Five years ago, these groups comprised 7.4 percent of all professional employees.

New Job Opportunities

Possibly of greater significance is that minorities and females continue to move into non-traditional jobs. In the last two years there have been appointments of minority plant managers, female chemical operators, female structural engineering supervisors and other challenging managerial and professional assignments. This represents a growing shift from measuring numbers of new jobs to the quality of the opportunity.

Minority Economic Development

The minority economic development program is a corporate-wide effort to seek out minority and female-owned firms as suppliers and contractors to Monsanto plants and offices throughout the United States. In 1978, additional minority resources were identified to serve all Monsanto locations and purchases from this network of suppliers grew to a total of $12 million, more than doubling 1977 purchases.

Monsanto now ranks second within the chemical industry in terms of the dollar value of business placed with minority and female-owned firms. The Company also is a recognized leader in this effort, both at its St. Louis headquarters and nationally.

The economic development program serves several important social responsibility and business objectives.

By supporting local suppliers and contractors from minority and female ranks, Monsanto helps increase employment and business opportunities for those groups where joblessness and limited opportunity is a critical national problem. The effort also benefits Monsanto by stimulating further competition for the multi-million dollar purchases the Company makes each year for equipment, supplies and services. Cost effectiveness is enhanced through this competitive stimulation.

Privacy Protection

During the year, Monsanto became one of a handful of major organizations to establish a formal corporate policy protecting employee privacy. This new policy sets guidelines for information maintained in personnel records and limits the release of such information to outside sources.

Other than for specific legal requirements, an employee's written consent is now required before information in personnel files can be released. Employees also may review and submit amendments to information held in a personnel file that the employee does not feel is accurate, timely or complete.

The intent of the policy, which reaffirms many privacy safeguards long practiced in Monsanto, is to standardize Company practice and to guarantee every employee's right to privacy.

Chemical Facts of Life

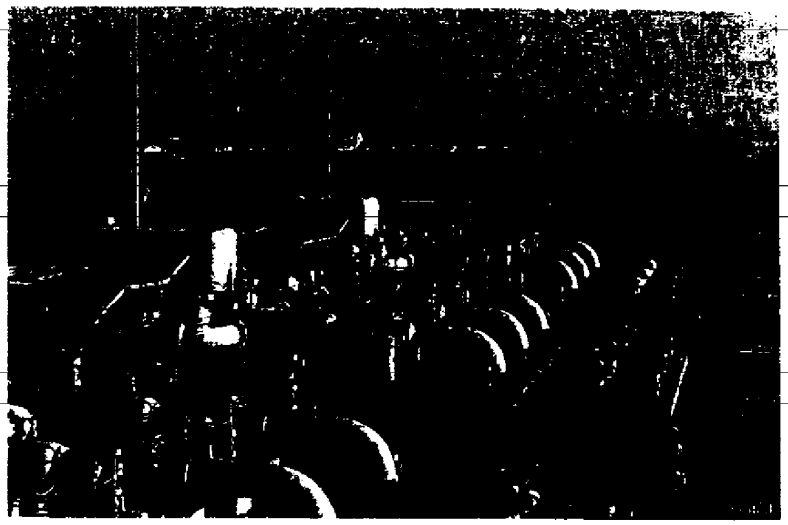
The Company's social responsibility commitment is inherent in its Chemical Facts of Life Program. Since the program's inception in 1977, Monsanto has sought to contribute to a more balanced national dialogue on chemical risks and benefits through television and magazine statements and public appearances at national and community forums across the country. The objective has been to stimulate full and responsible discussion of public issues involving chemicals, and their effect on the environment and the individual, before policy decisions are made.

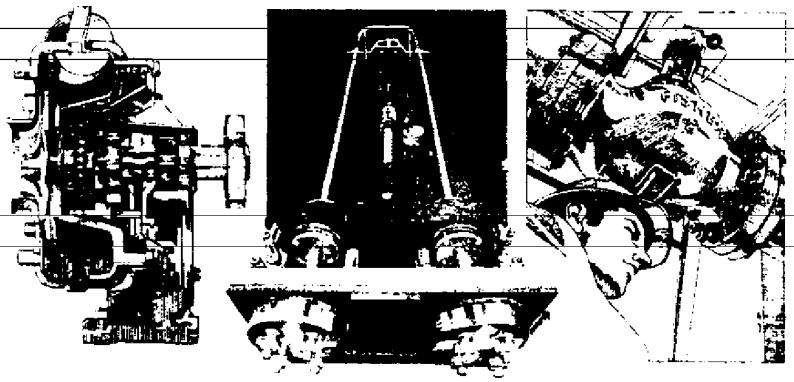
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FISHER CONTROLS CORPORATION

of Delaware





North Sea natural gas, providing fuel and energy for homes, business and industry throughout the United Kingdom, flows through Fisher Controls Corporation valves at Bacton, England. Controllers and regulators, designed by Fisher engineers, have scores of industrial uses throughout the world.

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FISHER CONTROLS CORPORATION

(Dollars in millions)

	Sales	Operating Income	Total Assets
1978	$284.2	$37.0	$202.5
1977	263.5	37.9	181.7
1976	210.8	24.3	148.6
1975	186.3	20.6	137.4
1974	136.3	9.2	127.1

This special section of the Annual Report has been added to provide shareowners a broader understanding of the various business elements that comprise the newly-created, Fisher Controls Corporation of Delaware. On February 28, 1979, the operations of the former wholly owned Monsanto subsidiary, Fisher Controls Company, Inc., were merged with the control valve and process instrumentation divisions of The General Electric Company Limited of the United Kingdom (GEC) to form a separate and free-standing enterprise serving worldwide markets. Monsanto is an approximate two-thirds owner of the new company and GEC has a one-third ownership interest.

The new corporation is a marriage of the talents and resources of two highly successful organizations. The former Fisher operations concentrated primarily in North America. The addition of the units from GEC provides increased opportunity for greater sales penetration into the important European market. The new company has been organized with a view toward maintaining continuity while preparing for growth and expansion.

Had the company been operational during 1978, its sales would have been in excess of $450 million. Its customers would have been served by more than 10,000 employees worldwide.

The management of the new Fisher Controls Corporation has been drawn from senior executives of Monsanto, GEC and Fisher. Technical centers are located in the United Kingdom, France and the United States while manufacturing operations are conducted in eleven countries throughout the world. Sales offices are located in 82 nations.

Fisher's worldwide businesses are principally in two broad areas. The first and oldest segment of its business—dating to 1880—is valves, regulators and pneumatic controllers. The second is newer and is characterized by faster evolving technology concerned with electronic controls and electronic control room instrumentation. The businesses complement each other in helping to form a complete system for the control of gasses and fluids.

Diverse Markets for Valves, Regulators and Controllers

The valve, regulator and controller segment of the new Fisher business currently contributes the bulk of its worldwide sales and operating income. Its markets are diverse and its product line broad. It ranges from low-cost regulators that control the flow of natural gas into millions of homes throughout the world to sophisticated products performing yeoman-like chores of controlling the flow of crude oil from the terminus of the Alaskan pipeline into waiting tankers at Prudhoe Bay to controlling vast volumes of natural gas flowing from the North Sea to homes, business and industry throughout the United Kingdom.

Technologically, Fisher is recognized as the industry leader anticipating the needs and creating an array of new products necessary for customers to compete in a more complex and more critical worldwide environment.

Fisher's engineering and manufacturing personnel are skilled in providing the company's vast marketing organization with the type of product so vital for maintaining the company's reputation for quality and reliability.

At Marshalltown, Iowa, the company's principal U.S. manufacturing and engineering location, over 5,000 valves are shipped each week in up to 70,000 different configurations meeting customer specifications for both standard and unique applications.

At manufacturing facilities in Rochester, England and Cernay, France, smaller volumes of valves, but with equally sophisticated specifications, are constructed from Fisher engineering designs. Differing governmental control requirements, particularly those associated with energy production, create unusual demands for the use of special alloys and pre-installation testing.

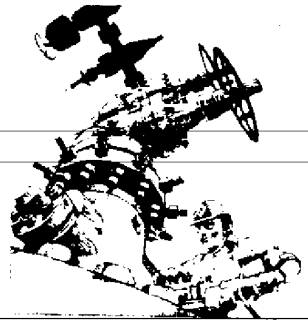
New Opportunities in Process Instrumentation

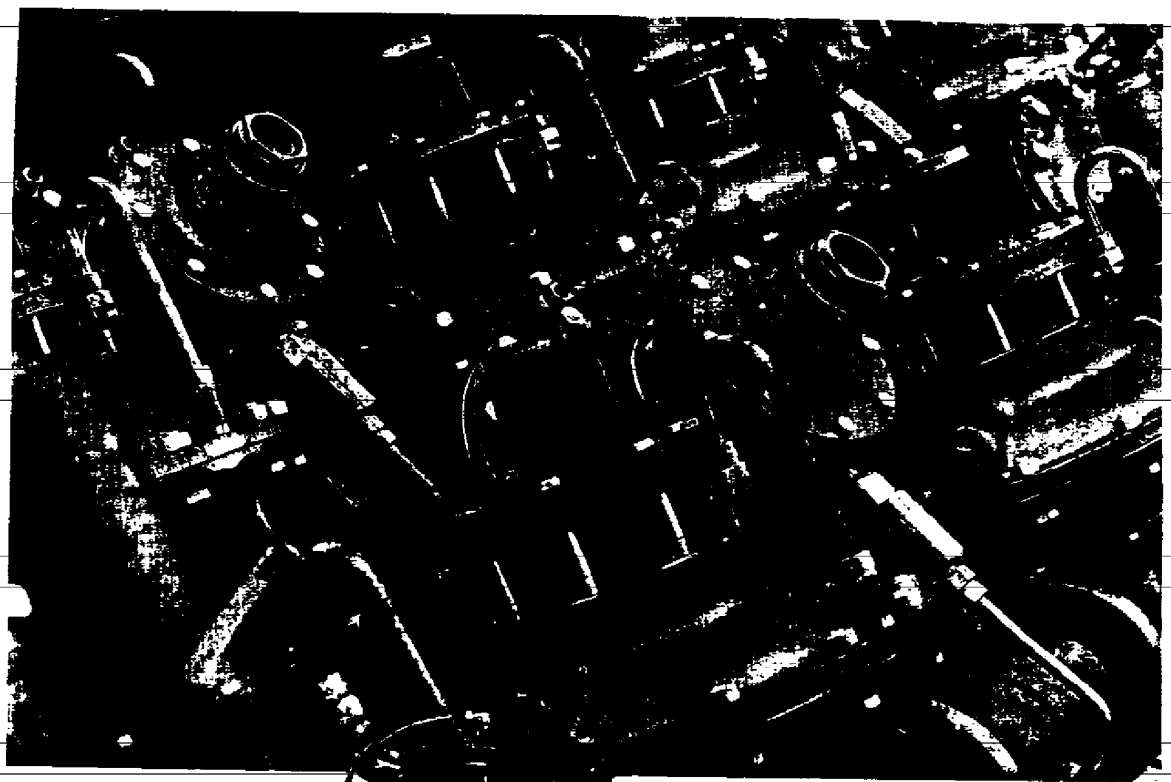
Fisher's process instrumentation business is comprised of hundreds of different devices used in scores of industrial processes. Field-mounted electronic and pneumatic instruments sense and transmit data to initiate the control process. Control room instruments receive the data from the

Fisher Controls products are recognized throughout the world for reliability and dependability. From valves, regulators and controllers to sophisticated electronic instrumentation, Fisher plays a vital role in controlling and measuring the flows of gasses and fluids.

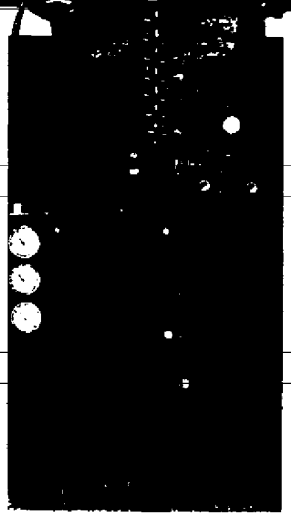
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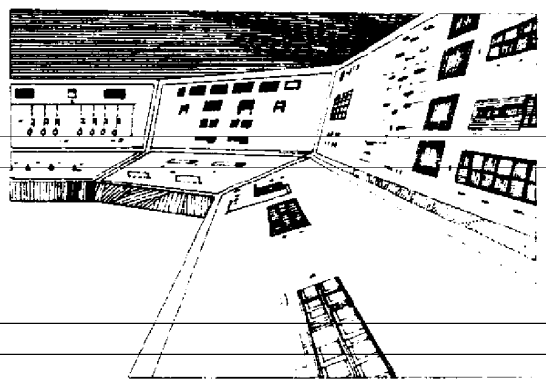
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field and then generate signals to the final control valves and regulators to hold, increase or decrease, stop or start flows. Fisher products are prominent at each stage of the control cycle.

Throughout the world, from centers controlling the electricity for the City of London, England to power plants in Omaha, Nebraska, Fisher electronic instrumentation plays a vital and necessary role. Both parties in the new Fisher enterprise, have made substantial scientific advances to improve automation, increase reliability and to provide new generations of equipment for electronic control. Technology in this area is constantly changing and rapidly increasing in its sophistication. The melding of the Fisher and GEC organizations into the new Fisher Controls Corporation is expected to provide new opportunities for the company to improve upon its established reputation of technological excellence.

Marketing Organization Strengthened

A major reason for Fisher's significant growth, year-after-year, is the strength of its worldwide marketing organization. In North America, and other world areas, Fisher's sales organization consists of independent sales representatives serving local markets. These individuals, most of whom have been associated with Fisher for at least ten years before becoming representatives, are fully supported by Fisher's own specialists at various factory locations. Through this system, Fisher maintains continuity between the customer and the marketing representative, a significant factor in building product loyalty. Through the representative system, more than 750 individuals in the United States and Canada promote and sell Fisher products. The company conducts extensive training programs to assure that its latest products and services are known and understood by its many customers.

Outside of the United States and Canada, Fisher's sales organization is primarily composed of company personnel serving broad and diverse markets through the new corporation's expanded sales office network serving its myriad of customers. Logistics and local market conditions are such that the direct sales method provides the best means of growing Fisher's sales base in some world areas. Supplementing this marketing effort in some world areas are independent Fisher manufacturers representatives.

Service Businesses Grow Substantially

A natural extension of Fisher's U.S. businesses was initiated in 1972 with the formation of the first Fisher Service Company to serve customers in the Gulf Coast petrochemical industry from a location near Baton Rouge, Louisiana. This fast-growing service business was expanded to a second location near Houston, Texas in 1977.

The success of the service centers prompted Fisher to announce the formation of three additional centers at Mansfield, Ohio, Burlington Township, New Jersey and Edmonton, Alberta, Canada early in 1979.

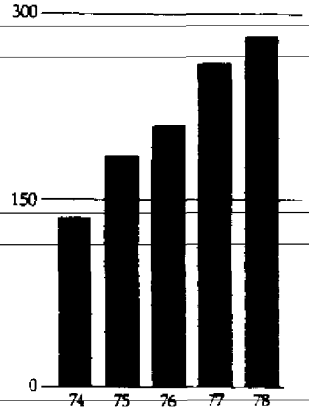
In West Germany, independent of its manufacturing operations, Fisher has an established business activity. Formerly a GEC unit, the facility is concerned with the installation, start-up and servicing of a broad spectrum of control systems. The skills in this service organization are utilized in virtually all areas of the world.

Future Prospects Bright

Many industries served by the Fisher Controls Corporation are expected to expand more rapidly outside of the United States. Through the merger of Fisher and GEC business units, the prospects for increasing market penetration in other world areas are bright.

The formation of Fisher Controls Corporation is the natural outgrowth of Monsanto's interest and expertise in automating production processes. Fisher's established reputation for quality and reliability in the process control valve field is combined with GEC's excellent background and experience in applying electronics technology to a broad range of control systems. Monsanto's personnel look forward to working constructively with their new colleagues from the highly successful GEC organization to better serve the growing worldwide process control market.

Fisher Controls Net Sales
(Dollars in Millions)



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FINANCIAL SECTION

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Responsibilities for Integrity of Financial Data

The management of Monsanto Company is responsible for the integrity of the financial data reported by the Company and its subsidiaries. Fulfilling this responsibility requires the preparation and presentation of financial statements and other data in accordance with generally accepted accounting principles which are consistently applied in all material respects. Management uses its best judgment to ensure that such statements reflect fairly the consolidated financial position, results of operations and changes in the financial position of Monsanto.

In order to gather and control financial data, Monsanto establishes accounting and reporting systems supported adequately by internal accounting controls. Internal accounting control is maintained by: (1) the selection and training of qualified personnel; (2) an appropriate division of responsibility in all organizational arrangements; (3) the establishment and communication of accounting and business policies; and, (4) an extensive program of internal audits with prompt follow-up, when necessary, at appropriate levels of management. In establishing systems of internal accounting control, management weighs the cost of such systems against the benefits that it believes can be derived. Management believes that the internal accounting control systems provide Monsanto with reasonable assurance that assets are safeguarded against loss from unauthorized use or disposition and that the financial records are reliable for preparing financial statements and other data and maintaining accountability for assets.

As ratified by shareowner vote at the 1978 Annual Meeting, Deloitte Haskins & Sells, an international firm of certified public accountants, examined the Company's consolidated financial statements contained in this Annual Report. Their examination was made in accordance with generally accepted auditing standards which provide for a review of the systems of internal accounting control and tests of a limited number of transactions. The principal result of this examination is the expression of an opinion, which appears on page 65, as to the fairness of the presentation of the Company's consolidated financial statements in accordance with generally accepted accounting principles consistently applied.

The Audit Committee of the Board of Directors is responsible for reviewing and monitoring the Company's financial reports and accounting practices to ascertain that they are within acceptable limits of sound practice in such matters. The membership of the Committee consists of three non-employee directors. At periodic meetings, the Audit Committee discusses audit and financial reporting matters with representatives of financial management, the internal audit function and Deloitte Haskins & Sells. In order to ensure complete independence, the certified public accountants and the director of the internal audit function have full and free access to meet with the Audit Committee—with or without the presence of management representatives—to discuss the results of their examinations, the adequacy of internal accounting controls and the quality of financial reporting.

John W. Hanley
Chairman of the Board and President
(Chief Executive Officer)

James J. Kerley
Executive Vice President
(Chief Financial Officer)

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FINANCIAL REVIEW

(Dollars in millions, except per share)

Restatement

As a result of the Fisher Controls merger on February 28, 1979, the responsibility for certain operations of the former Commercial Products Company was transferred to the Industrial Chemicals Company. Also in 1979, the responsibility for the management of elemental phosphorus manufacturing operations was transferred from the Industrial Chemicals Company to the Chemical Intermediates Company. All financial data shown herein have been restated to reflect the new organization. *Cycle-Safe*, an operation terminated in 1977 of the former Commercial Products Company, is shown separately where necessary in reconciling to the consolidated totals for prior years.

In addition, operating income of the operating companies and Fisher Controls was restated for 1974 and 1975 to reflect the requirements of Financial Accounting Standards Board Statement No. 14. Operating income for 1977 and 1976 had been restated on this new basis in the prior year. The restatement of 1974 and 1975 operating income consisted of separating eliminations and certain corporate expenses from the operating companies' and Fisher Controls' results, which amounts had previously been allocated.

Description of Business

The Monsanto Company was founded in St. Louis, Missouri in 1901. Today it is the fourth largest U.S. chemical company with annual sales of $5.0 billion. Of this amount, approximately two-thirds of sales are made in the United States with the remainder in other areas of the world.

The Company manufactures and sells a diversified line of products including chemical, plastic, agricultural, man-made fiber and electronic products that are derived from petroleum, natural gas, phosphate ore and other raw materials. The Company has 64 plants in the United States and, either directly or through affiliated companies, has investments in twenty other countries around the world.

Monsanto's worldwide businesses are managed by five operating companies, an International Division, fourteen corporate staff departments and the majority-owned Fisher Controls Corporation of Delaware. The five operating companies have a high degree of line and staff authority and operate their businesses on a worldwide basis. The five operating companies are organized on the basis of market-focus and, as such, they serve the following markets:

- Agricultural Chemicals
- Chemical Intermediates
- Industrial Chemicals
- Plastics & Resins
- Textile Fibers

Fisher Controls is a self-contained enterprise serving the worldwide process controls market.

The demand for Monsanto's products comes from many sectors of the economies in which the Company operates. In general, Monsanto sells little of its product to end-users but, rather, supplies materials to other industries which, in turn, manufacture the end product. For 1978, Monsanto's sales–based on the industries served–were broken down as follows:

	1978 Sales
Agriculture, Food Processing	17%
Motor Vehicles	16
Construction & Equipment	13
Clothing	11
Carpets, Textile Home Furnishings	8
Pharmaceuticals, Soaps & Toiletries	7
Appliances, Furniture & Fixtures	6
Chemical Industry	4
Packaging	4
Other	14
	100%

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Economics of Major Markets

Because it is a producer of materials that are supplied to a number of end-product industries, the demand for Monsanto's products is influenced by growth trends in a number of major end-use markets. These charts depict the growth trends in several of these markets in the U.S. economy and also show macro-growth data in several of the major countries outside of the United States that are of particular importance to Monsanto.

Recessionary slowness was prevalent in 1974 and 1975. Motor vehicle sales recovered rapidly the past three years, setting a record in 1978 of nearly 15½ million automobiles and trucks. Emphasis on lighter automobiles has created new opportunities for lightweight materials–such as plastics–to assist automobile designers in their quest for improved gasoline mileage.

New housing starts and mobile home sales have exhibited strong growth since 1975. Single-family housing has been an important element of the current economic expansion–reflecting strong underlying demographic demand and personal preference for investment in home ownership as an inflation hedge.

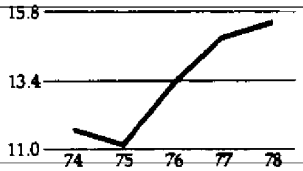
Real consumer spending on goods–the single most important sector of the economy–increased at a 4.2 percent annual rate from 1974 through 1978. This provided growing demand in important markets such as appliances, furniture and home furnishings, soaps and detergents, pharmaceuticals, prepared and packaged food, apparel, automobiles and tires.

Textile mill product output experienced slower growth–averaging 2.2 percent per year since 1974. Demand for man-made fibers in 1978, in the U.S., benefited from strong home furnishings markets–particularly carpets. Growth in apparel sales, however, has been affected adversely by increasing competition from imported garments.

Nonresidential investment (e.g., business construction and equipment) gained strength in 1978, after three off years, resulting in a slower growth pattern from 1974 through 1978 of 2.7 percent. This sector of the economy is expected to grow at a faster pace in the future and provide increasing demand for various Monsanto products.

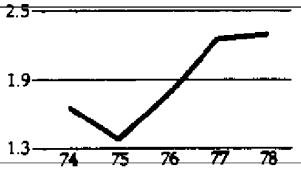
The agricultural sector is relatively cycle free. Farm acreage planted in major crops in the U.S. averaged a steady 330 million acres from 1974 to 1978, providing a solid base for a wide variety of

New Motor Vehicle Sales
(Millions of Units)



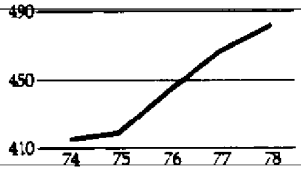
Annual Growth 8.9%

Total New Housing Units
(Millions of Units)



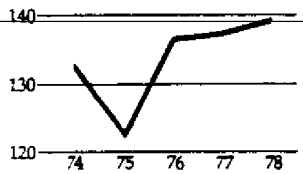
Annual Growth 12.2%

Consumer Spending on Goods
(Billions of 1972 Dollars)



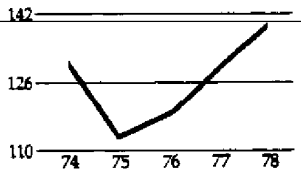
Annual Growth 4.2%

Textile Mill Products
(Year 1967 = 100)



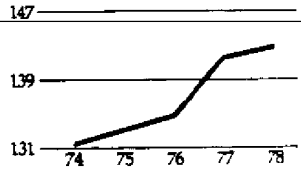
Annual Growth 2.2%

Nonresidential Investment
(Billions of 1972 Dollars)



Annual Growth 2.7%

Corn and Soybean Acres
(Millions of Acres)



Annual Growth 2.3%

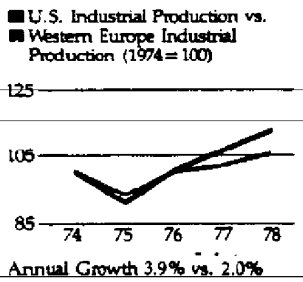
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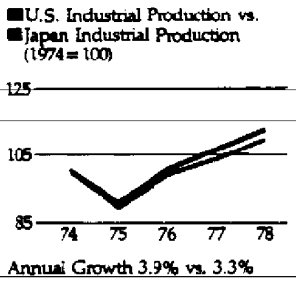
agricultural chemicals. Acres planted in corn and soybeans, important crops to Monsanto, increased at an average of 2.3 percent per year.

The various economies of the world were weaker than the U.S. from 1974 through 1978. Western Europe recovered slowly from the 1974-1975 recession, due in part to sustained governmental efforts to reduce inflation. Its rate of industrial production grew two percent per year compared with four percent annual growth in the U.S. This unusually weak pace of economic growth contributed to excess capacity in the chemicals, plastics and fibers industries in Europe.

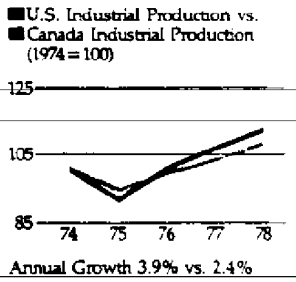
Industrial output for the past five years in Japan (3½ percent average growth per year) and Canada (2½ percent per year) outperformed Western Europe but trailed the United States. The developing nations of Latin America and the Asia-Pacific region, by contrast, significantly outperformed the highly industrialized countries. High oil costs, balance of payments pressure and higher levels of external debt, however, hindered economic growth. As an example, Brazil's real economic growth of nearly six percent per year from 1974 through 1978 was significantly below the ten percent average annual rate experienced during the prior ten years.



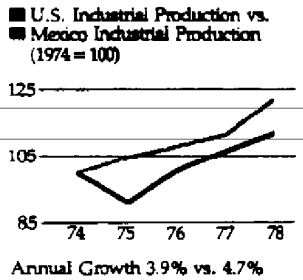
Annual Growth 3.9% vs. 2.0%



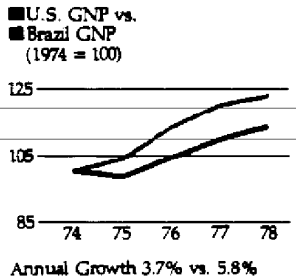
Annual Growth 3.9% vs. 3.3%



Annual Growth 3.9% vs. 2.4%



Annual Growth 3.9% vs. 4.7%



Annual Growth 3.7% vs. 5.8%

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Consolidated Operating Results For 1977-1978

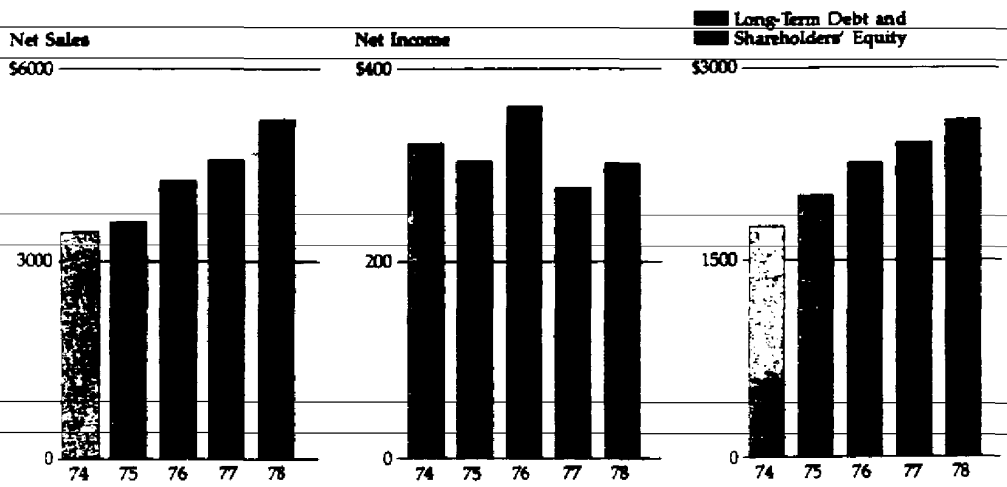
Monsanto's consolidated sales for 1978 were $5.019 billion–up 9.2 percent from the $4.595 billion of 1977.

Net income for the year–at $302.6 million–was the fourth highest in the Company's history and represented an improvement of 9.8 percent over 1977.

For the year, primary earnings per common share were $8.29 and fully diluted earnings were $8.21 per share. For 1977, earnings per share were $7.46 primary and $7.37 fully diluted.

	Quarter				
	First	Second	Third	Fourth	Year
Net Sales					
1978	$1,342.7	$1,185.0	$1,187.0	$1,304.0	$5,018.7
1977	$1,306.1	$1,122.1	$1,075.8	$1,090.5	$4,594.5
% Change	2.8%	5.6%	10.3%	19.6%	9.2%
Net Income					
1978	$ 135.7	$ 76.1	$ 46.8	$ 44.0	$ 302.6
1977	$ 147.9	$ 81.5	$ 24.9	$ 21.3	$ 275.6
% Change	(8.2)%	(6.6)%	88.0%	106.6%	9.8%
Earnings per Share					
Primary					
1978	$ 3.71	$ 2.09	$ 1.28	$ 1.21	$ 8.29
1977	$ 4.01	$ 2.21	$ 0.66	$ 0.58	$ 7.46
% Change	(7.5)%	(5.4)%	93.9%	108.6%	11.1%
Fully Diluted					
1978	$ 3.67	$ 2.07	$ 1.27	$ 1.20	$ 8.21
1977	$ 3.95	$ 2.18	$ 0.66	$ 0.58	$ 7.37
% Change	(7.1)%	(5.0)%	92.4%	106.9%	11.4%

The year-to-year improvement in sales resulted from strong demand for many of the products produced by the Company. As indicated in the above table, year-to-year sales growth improved



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(Dollars in millions, except per share)

throughout 1978 and each quarter represented a higher level of year-to-year percentage improvement than the prior quarter.

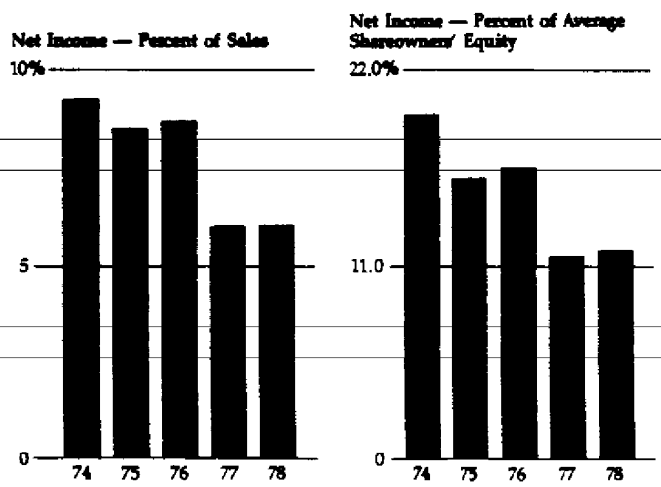
The quarterly pattern of 1978 sales was somewhat different than for prior years. The Company's principal crop protection chemicals are sold on a seasonal basis and are concentrated heavily in the early months of the year. Because of this, Monsanto's first-quarter sales are normally the highest of any quarterly reporting period. Sales for the second and third quarters declined–as is the Company's normal pattern–but sales were strong in the fourth quarter as almost all areas of the Company's product lines experienced strong demand–some portion of which may have represented anticipatory buying.

Of the 9.2 percent improvement in year-to-year sales, approximately one-third or 2.7 percent represented higher year-to-year selling prices with the remainder or 6.5 percent coming from increased sales volume.

The strong first-quarter sales performance of Agricultural Products was partially offset by pricing pressure on the products of Chemical Intermediates, Plastics & Resins and Textiles–all reflecting excess capacity. Second-quarter sales continued to be impacted by price pressures resulting from continued excess industry capacity in Chemical Intermediates and Textiles. These conditions resulted in essentially flat year-to-year selling prices whereas the cost of operations in these product lines continued to increase.

The third quarter comparison improved markedly. Third-quarter operating results in the U.S. increased substantially. Net income was adversely impacted, however, by operations outside of the United States. The third quarter of both 1977 and 1978 included non-recurring items. For 1977, the quarter included a series of write-offs and divestitures that penalized net income by $31.6 million or $0.86 per primary share. The principal item was the write-down of fixed assets associated with the *Cycle-Safe* container operation. For the third quarter of 1978, Monsanto completed the sale of its high density polyethylene business, which added $7.1 million or $0.20 per primary share to reported net earnings.

Fourth-quarter net sales and net income increased sharply compared with the same period of 1977. Industrial Chemicals experienced strong demand for rubber chemicals, specialty chemicals and plasticizers. Agricultural Products, Chemical Intermediates, Textiles and Fisher Controls recorded year-to-year sales gains and improved operating income. Plastics & Resins recorded improved sales for the fourth quarter. Its operating income, however, was penalized by significant losses recorded by Aiscondel, the majority-owned subsidiary in Spain. For the fourth quarter, there was also a



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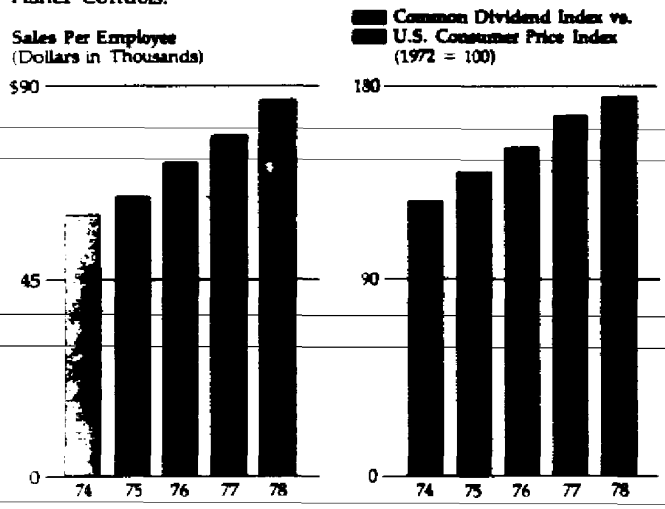
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significant improvement in foreign exchange and translation losses – from a charge to earnings of $0.60 per primary share in 1977 to a charge of $0.12 for 1978.

Sales – 1978	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
Agricultural Products	$ 352.9	$ 128.3	$ 115.1	$ 138.1	$ 734.4
Chemical Intermediates	112.9	128.8	135.7	145.8	523.2
Industrial Chemicals	308.5	324.1	313.4	344.1	1,290.1
Plastics & Resins	268.6	299.2	313.7	342.1	1,223.6
Textiles	231.6	235.4	239.3	256.9	963.2
Total Operating Companies	1,274.5	1,115.8	1,117.2	1,227.0	4,734.5
Fisher Controls	68.2	69.2	69.8	77.0	284.2
Total Consolidated	$1,342.7	$1,185.0	$1,187.0	$1,304.0	$5,018.7

Operating Income – 1978	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
Agricultural Products	$ 168.9	$ 48.6	$ 46.0	$ 40.3	$ 303.8
Chemical Intermediates	22.5	20.1	19.0	13.5	75.1
Industrial Chemicals	57.4	61.1	45.8	54.4	218.7
Plastics & Resins	16.1	23.1	18.9	(0.5)	57.6
Textiles	1.5	(4.9)	(6.0)	(19.8)	(29.2)
Total Operating Companies	266.4	148.0	123.7	87.9	626.0
Fisher Controls	11.2	8.4	5.3	12.1	37.0
Total Operating Companies and Fisher Controls	277.6	156.4	129.0	100.0	663.0
Eliminations	4.0	(0.9)	(1.6)	(1.5)	
Unallocated Corporate Expense	(6.7)	(7.8)	(7.8)	(9.0)	(31.3)
Total Consolidated	$ 274.9	$ 147.7	$ 119.6	$ 89.5	$ 631.7

Sales of most major product groups for 1978 increased over 1977. The largest increases were achieved by Herbicides, Insecticides & Other Products, Man-Made Fibers, Plastic Materials, Detergents & Phosphates, Resin Products, Specialty Chemicals, Rubber Chemicals, Plasticizers, and Fisher Controls.



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(Dollars in millions, except per share)

Sales by Product Group

	1978	1977	1976	1975	1974
Agricultural Products:					
Herbicides, Insecticides & Other Products	$ 734.4	$ 654.0	$ 573.2	$ 547.4	$ 410.7
Chemical Intermediates:					
Petrochemicals	288.4	286.6	284.0	230.5	258.1
Process Chemicals	160.9	154.6	147.2	137.2	134.3
Oil & Gas Production and Exploration	73.9	80.8	67.0	58.5	50.8
Industrial Chemicals:					
Detergents & Phosphates	348.5	311.4	288.5	279.5	228.1
Specialty Chemicals	324.1	293.7	254.9	206.3	196.5
Rubber Chemicals	255.6	228.8	199.0	172.4	169.7
Plasticizers	228.1	203.7	186.0	158.7	168.1
Electronic Materials and Chemical & Environmental Systems	133.8	118.8	180.2	131.7	162.7
Plastics & Resins:					
Plastic Materials	661.1	589.9	514.4	360.5	395.4
Resin Products	355.2	321.1	291.5	223.5	227.9
Fabricated Products	207.3	200.2	212.8	184.3	189.3
Textiles:					
Man-Made Fibers	963.2	884.3	853.5	747.2	770.0
Total Operating Companies	4,734.5	4,327.9	4,052.2	3,437.7	3,361.6
Fisher Controls:					
Valves, Regulators & Electronic Process Controls	284.2	263.5	210.8	186.3	136.3
Total Operating Companies and Fisher Controls	5,018.7	4,591.4	4,263.0	3,624.0	3,497.9
Cycle-Safe Containers		3.1	7.2	0.7	
Total Consolidated	$5,018.7	$4,594.5	$4,270.2	$3,624.7	$3,497.9

During 1978, Monsanto withdrew from several businesses with annual sales volumes of approximately $100 million. These were businesses that did not fit in with Monsanto's long-term objectives. In the U.S., the Company sold its high density polyethylene line, closed the Spartanburg, South Carolina plant of Olympia Industries, Inc. and sold the Monsanto Flavor/Essence, Inc. subsidiary. Outside the U.S., the Company sold its European polystyrene plastics business. These, plus other minor divestitures, resulted in a full-year gain after tax of approximately $8.7 million.

Cycle-Safe, an operation terminated in 1977, had operating losses of $51.9 million, $43.4 million, $35.8 million and $20.3 million for 1977 through 1974, respectively.

During January 1979, the Company announced that an agreement in principle was signed for the sale of the Optoelectronics and III-V Electronic Materials businesses of Monsanto.

Analysis of Change in Primary Earnings per Share

The year-to-year gain in 1978 sales volume, higher year-to-year selling prices and lower raw material costs were more than sufficient to offset higher manufacturing and nonmanufacturing expenses. Included in other manufacturing costs is the favorable impact of the $0.20 per primary share gain on the sale of the high density polyethylene business. Interest expense increased in 1978 as a result of additional borrowings in the United States. This plus a higher effective tax rate–which includes continued losses in certain manufacturing operations outside the United States that could not be tax effected–resulted in an unfavorable impact on earnings. The net effect of these factors was an increase in primary earnings per share of $0.83, from $7.46 for 1977 to $8.29 for 1978.

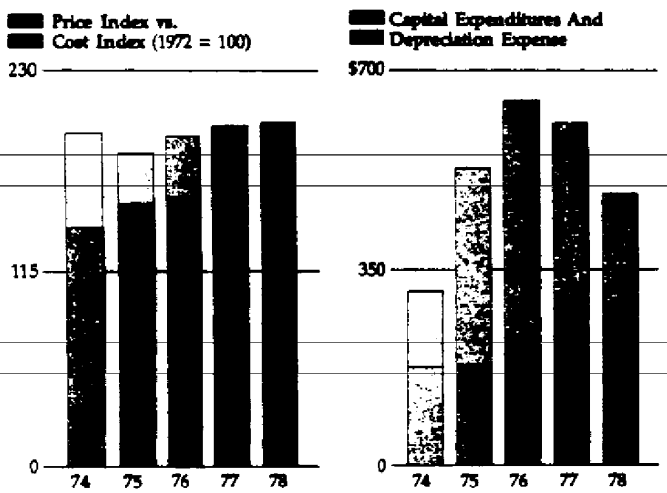
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Higher selling prices had the most significant positive effect on primary earnings per share during 1977. Earnings per share were also favorably impacted by increased sales volumes. These favorable

	1978 vs. 1977	1977 vs. 1976
Operating Income:		
Higher Selling Prices	$ 1.76	$ 2.47
Sales Volume and Product Mix	0.30	0.91
Higher Raw Material Prices	(0.19)	(0.65)
Higher Other Manufacturing Costs	(0.79)	(2.57)
Lower Start-up Costs	0.22	0.02
Higher Nonmanufacturing Expenses	(0.98)	(1.13)
Increase (Decrease) in Operating Income	$ 0.32	$(0.95)
Other Causes:		
Higher Interest Expense	$(0.24)	$(0.10)
Higher (Lower) Other Income Credits–Net	0.68	(0.49)
Higher Effective Tax Rate	(0.02)	(0.97)
Decreased (Increased) Shares Outstanding	0.09	(0.08)
Increase (Decrease) from Other Causes	$ 0.51	$(1.64)
Net Increase (Decrease)	$ 0.83	$(2.59)

influences, however, were more than offset by higher raw material prices and other manufacturing costs. In addition, higher nonmanufacturing expenses affected 1977 earnings per share unfavorably. Included in the adverse impact of higher other manufacturing costs was a $0.55 per primary share charge resulting from the shutdown costs and write-down of the fixed asset investment in the *Cycle-Safe* container program. Higher other manufacturing costs also included a $0.39 per primary share charge resulting from anticipated losses due to terminating or divesting certain product lines. Lower other income credits, which include exchange and translation losses, and a higher tax rate also impacted earnings per share unfavorably. Higher interest expense–due to additional borrowings for planned capital additions–and an increased number of shares outstanding added to the downward pressure on earnings per share.



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FINANCIAL REVIEW

(Dollars in millions, except per share)

International Operations

Sales outside of the United States increased at a faster rate than Monsanto's U.S. business. Sales of products manufactured outside of the U.S. plus exports from the U.S. were $1,688.3 million, an increase of $261.9 million compared with 1977. Export sales from the U.S. during 1978 were $630.9 million compared to $526.7 million in 1977. The fastest growing markets for Monsanto were Europe-Africa and Asia-Pacific in 1978.

Sales	1978	1977	Percent Increase	Percent of 1978
United States	$3,631.1	$3,409.5	6.5%	72.3%
Europe-Africa	848.2	706.0	20.1	16.9
Canada-Latin America	385.8	352.6	9.4	7.7
Asia-Pacific	153.6	126.4	21.5	3.1
Total Company	$5,018.7	$4,594.5	9.2%	100.0%
Operating Income				
United States	$ 630.7	$ 614.1	2.7%	99.8%
Europe-Africa	15.2	8.5	78.8	2.4
Canada-Latin America	10.0	11.9	(16.0)	1.6
Asia-Pacific	10.5	7.0	50.0	1.7
Eliminations	(3.4)	(5.1)		(0.5)
Unallocated Corporate Expense	(31.3)	(26.7)		(5.0)
Total Company	$ 631.7	$ 609.7	3.6%	100.0%

Improving economic conditions around the world combined with improved operating results for Monsanto in Europe-Africa resulted in better operating income for 1978.

Research and Development

Research and development expenditures increased nine percent from $132.3 million in 1977 to $144.3 million in 1978. A significant portion of the increase reflects expansion of research and development programs in the Agricultural Products Company.

Foreign Exchange Losses

Earnings for 1978 were reduced by losses from foreign currency transactions and the translation of foreign currency financial statements in the amount of $32.5 million–equal to $0.89 per primary share as compared with $34.2 million and $0.93 per primary share for 1977.

	Foreign Currency Losses (Gains)					
	1978			1977		
	Cost of Sales	Other Income	Total	Cost of Sales	Other Income	Total
Foreign currency transactions and translation of Ex-USA subsidiaries' financial statements	$5.9	$21.8	$27.7	$4.4	$27.1	$31.5
Translation of foreign currency financial statements of affiliated companies		14.1	14.1		7.0	7.0
Forward exchange contracts		(13.5)	(13.5)		(1.6)	(1.6)
Before-tax losses	$5.9	$22.4	28.3	$4.4	$32.5	36.9
Related income taxes			4.2			(2.7)
After-tax losses			$32.5			$34.2

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Financial Accounting Standards Board Statement No. 8 requires that–when denominated in foreign currencies–net working capital (except inventory) and long-term debt are to be translated at current exchange rates. Inventory and property, plant and equipment are required to be translated at historical exchange rates. The net balance sheet amounts translated at the current rates of exchange determine the level of translation gains or losses that are charged immediately to earnings.

The immediate recognition of foreign currency translation losses has resulted in wide quarter-to-quarter fluctuations in reported earnings. For 1978, Monsanto's first and third quarters included sizable foreign currency losses whereas, for 1977, the second and fourth quarters were the periods most seriously impacted by currency losses.

	Foreign Currency Losses			
	1978		1977	
Quarter	After Tax	Per Primary Share	After Tax	Per Primary Share
First	$12.8	$0.35	$ 3.8	$0.10
Second	2.7	0.07	8.0	0.22
Third	12.5	0.35	0.4	0.01
Fourth	4.5	0.12	22.0	0.60
Total Year	$32.5	$0.89	$34.2	$0.93

The U.S. dollar has devalued significantly against most major currencies over the past two years, resulting in the translation losses reported by Monsanto. These losses were, for the most part, unrealized losses–that is, they have no current cash flow effect. In addition, they may never be realized for several reasons:

- The U.S. dollar may strengthen before foreign currency liabilities must be liquidated. The Company could then report translation gains, to the extent that such liabilities are unhedged.
- To the extent that operations outside of the U.S. generate sufficient cash flow to liquidate their local obligations, translation losses would not be realized until foreign net assets are repatriated to Monsanto in the U.S. In such circumstances, if the liquidation value of these assets had appreciated–along with the appreciation of the local currency–above their U.S. dollar historical book value, there would be a partial offset to these translation losses.
- Monsanto's substantial operations abroad require a permanent investment in assets that may, in most cases, never be liquidated and remitted to the U.S.

The principal foreign currency translation exposures of Monsanto include substantial long-term debt denominated in foreign currencies–most significantly in the U.K. pound sterling and the Belgian franc. The Company has a very active program to manage its foreign currency risks by evaluating long-term economic exposures and utilizing a variety of hedging techniques. The principal emphasis of its foreign currency risk management program is to preserve the Company's earnings potential. In 1978, considering the weakness in the U.S. balance of payments and expectations of continued pressure on the U.S. dollar, the Company adopted a more active posture with respect to forward exchange contracts in order to hedge exposures. Forward positions have been taken in a number of currencies with emphasis on the U.K. pound sterling and the Belgian franc. Foreign currency losses for 1978 do not reflect the full effect of the Company's position in forward exchange contracts because these positions were instituted gradually throughout the year. Additional forward exchange contracts may be entered into or existing positions adjusted in the future–if such action is indicated by the Company's long-term economic exposures and the prospects for the U.S. dollar and the various currencies in which the Company conducts its business.

The Financial Accounting Standards Board has scheduled a review of all of its accounting standards, with Statement No. 8 receiving first priority. Monsanto applauds this open-minded attitude and hopes that Statement No. 8 can be modified to allow a more accurate depiction of true operating results while still acknowledging the risk of investing capital outside of the United States.

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FINANCIAL REVIEW

(Dollars in millions, except per share)

Pension Plans

Most Company employees are covered by pension plans. This section of the Financial Review sets forth information aimed at assisting in the analysis and understanding of Monsanto's pension expense and pension funding position for 1978 and for 1977.

	1978	1977
Pension Expense:		
Amount	$ 84.2	$ 74.6
Per primary share	$ 1.21	$ 1.06
Percent of wages, salaries and employee benefits	6.4%	6.5%
Pension Plans' Funding Status Data*:		
Present value of accrued benefits	$739.3	$688.3
Plans' assets (at market value)	711.5	621.4
Unfunded present value of accrued benefits	$ 27.8	$ 66.9

*For the Company's two largest plans in the U.S. only. These two plans accounted for 77.2 percent and 84.7 percent of total 1978 and 1977 pension expense, respectively.

Annual valuations of the Pension Plans are made by an outside firm of actuaries. The "entry age normal" actuarial method is used. The key actuarial assumptions used include an annual average investment return on pension assets of seven percent, an average salary increase (when applicable) of six percent and an average retirement age of 61 years.

The actuarial method and the assumptions used were consistent for 1977 and 1978. They are reviewed regularly by both the Company's outside actuaries and by the Pension and Savings Funds Committee of the Board of Directors. The Company believes that the methods and assumptions used, in the aggregate, are reasonable for the purpose of determining the annual pension funding requirements.

The above table of "Pension Plans' Funding Status Data" covers the two largest domestic Plans and reflects the present value of accrued benefits. "Accrued benefits," which include vested and non-vested pension benefits that have been accrued on the basis of employee service and earnings to date, is a different measure of pension funding than either unfunded prior service costs ($384.1 million as of December 31, 1978), which are required to be disclosed in the Company's Form 10-K by the Securities and Exchange Commission, or the excess of vested benefits over the market value of the Plans' assets ($5.4 million as of December 31, 1978), which is required to be disclosed in the Notes to Financial Statements by existing accounting principles.

In the actuarial valuation process, an actuary calculates the present value of prospective benefits which identifies the amount of funds needed to provide benefits in future years to all employees then covered by a pension plan. There are various actuarial methods to budget the present value of prospective benefits that are to be financed. Some methods do not develop unfunded prior service costs (sometimes referred to as "unfunded actuarial liability"). The actuarial method–"entry age normal"–tends to develop relatively large unfunded prior service costs and is used by the Company because it levels out pension costs as a percent of future payroll.

Unfunded prior service costs can vary significantly as a result of the budgeting method used and can include benefits that have not yet been earned by employees. For this reason, the Company believes that the comparison of the market value of the Plans' assets to (i) the present value of vested benefits (as disclosed in the Notes to Financial Statements) and (ii) the "unfunded present value of accrued benefits" (as reflected in the table above) are more meaningful measures of the Pension Plans' funding status than the identification of unfunded prior service costs. The Company considers "accrued benefits" to be a more comprehensive portrayal of funding status than "vested benefits".

Pension expense in 1978 increased as compared with 1977 due principally to the effect of increased wages and salaries and the effect of improved benefits in the United Kingdom.

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Capital Spending

Worldwide capital expenditures for 1978 were $479.9 million–21 percent lower than the $607.1 million of 1977. Expenditures outside of the U.S.–at $138.9 million–were 23.9 percent of the total and were made primarily in the Europe-Africa area.

Total expenditures–1978 vs. 1977–were down due principally to the large number of major plant completions in the previous two years. During 1978, Chemical Intermediates had the largest portion of worldwide capital additions–with major expenditures for the new acrylonitrile plant at Teesside, England, the Conoco joint venture at the Chocolate Bayou facility in Texas and oil and gas development. For Plastics & Resins, major projects included new capacity for *Lustran* ABS/SAN plastics in the U.S. and continued expansion at the plant in Antwerp, Belgium. Projects were also under way to expand capacity for the *Saflex* polyvinyl butyral interliner at Ghent, Belgium. Construction of a new plant for *Santicizer* 160 plasticizer in Brazil, expansion of the *Santogard* PVI rubber prevulcanization inhibitor at Ruabon, Wales and phased expansion of silicon capacity at St. Peters, Missouri were the principal expenditures in support of Industrial Chemicals. Expenditures for Agricultural Products and Textiles were down compared with 1977. Expenditures for environmental control projects amounted to $60 million–approximately twelve percent of total capital expenditures. Capital expenditures for energy conservation projects were $57 million, also approximately twelve percent of total Monsanto expenditures in 1978.

Major Operating Expenses

Although Monsanto's purchase price of feedstock for its petrochemical operations increased approximately 8½ percent for 1978, the total price of purchased raw materials–on a year-to-year basis–declined by one percent. The improvement in these costs was a result primarily of lower prices from suppliers that were affected by excess production capacity in their industries.

The cost of energy and utilities increased at an approximate nine percent rate in 1978. Energy conservation programs adopted in 1973 have since reduced energy purchases by 17½ percent. Without the programs, Monsanto's cost of energy would have been an estimated $85 million higher in 1978.

	1978	1977
Purchased raw materials	$1,538.4	$1,501.6
Purchased energy	375.2	345.2
Depreciation, amortization and depletion	265.5	239.5
Repairs and maintenance	349.5	289.3
Wages, salaries and employee benefits	1,318.1	1,145.1
Taxes:		
Income	273.7	248.1
Payroll	80.0	58.2
Property and other	65.3	68.9
Rents	54.9	41.1

Wages, salaries and employee benefits were up by 15 percent and related payroll taxes increased by 37 percent in 1978 compared with 1977. Wages and related costs had also increased in 1977 compared with the prior year.

A higher level of investment in property, plant and equipment in both 1978 and 1977 resulted in increased depreciation and repairs and maintenance for those years. Depreciation, amortization and depletion increased by 11 percent in 1978 compared with 1977. Repairs and maintenance were up 21 percent and property and other taxes remained essentially the same. Rent expense increased approximately 34 percent in 1978 principally as a result of increased rental activities in most operating companies.

Income taxes were ten percent greater in 1978 compared to 1977 due to increased pre tax earnings.

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FINANCIAL REVIEW

(Dollars in millions, except per share)

Financial Position

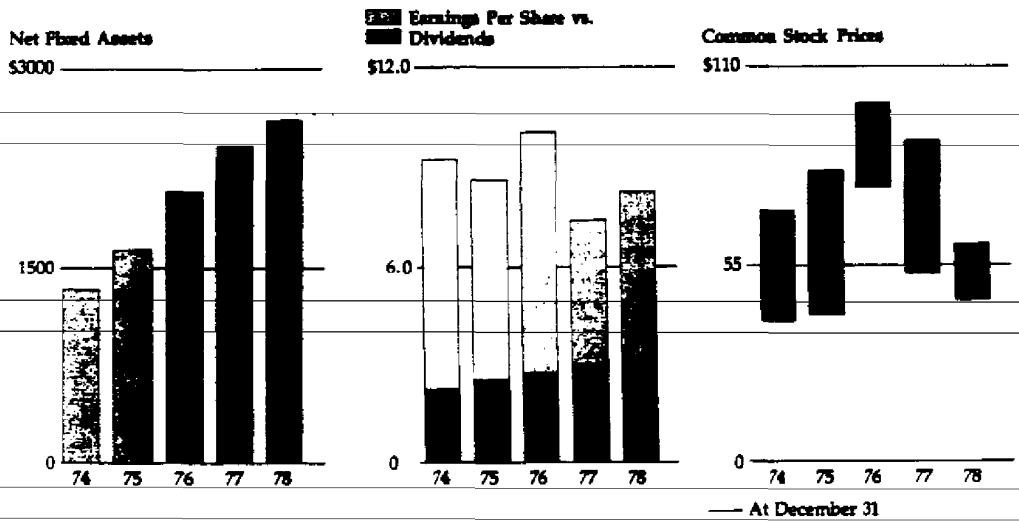
Monsanto's financial position remained sound. Net working capital–current assets less current liabilities–increased by $215.7 million and the year-end 1978 current ratio was 2.5:1.

	1978	1977
Working Capital	$1,295.7	$1,080.0
Net Property, Plant and Equipment	2,604.8	2,408.7
Long-Term Debt	1,223.5	1,030.6
Other Assets (Liabilities)—Net	(97.6)	(57.2)
Shareowners' Equity	$2,579.4	$2,400.9
Current Ratio	2.5:1	2.6:1
Debt-to-Capitalization	32.2%	30.0%
Interest Coverage (times)	6.6	7.1
Return on Average Shareowners' Equity	12.2%	11.9%

Long-term debt was increased by $192.9 million during 1978. In May, Monsanto sold $200 million of thirty-year debentures. The issue was well received by the investment community and carries an 8¾ percent coupon. Prior to the offering, Moody's and Standard & Poor's–the two major rating agencies–reconfirmed Monsanto's debt rating at a double-A. During 1978, the Company also financed pollution control facilities with $10.0 million of industrial revenue bonds and raised $51.5 million through various types of long-term debt arrangements for its Ex-USA operations.

At December 31, 1978, Monsanto's long-term debt represented 32.2 percent of total capitalization. Debt retirements scheduled during the next five years–1979 through 1983–total $228.7 million.

The continuation of a high level of earnings, coupled with a conservative dividend policy, resulted in a further increase in shareowners' equity, which topped $2.5 billion at the end of 1978.



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Dividend Payments

For 1978, common stock dividends paid by Monsanto amounted to $114.8 million–the equivalent of $3.175 per share compared with $3.025 per share for 1977. The Board of Directors increased the quarterly dividend, effective with the second-quarter payment of 1978, from $0.775 to $0.80 per share. The dividend has been increased in each of the past six years and has been paid quarterly, without interruption or reduction, since 1928. The dividend yield on the average price of Monsanto common stock was 6.08 percent in 1978 and 4.29 percent in 1977.

Common Stock Dividends per Share

Quarter	1978	1977
First	$0.775	$0.70
Second	0.80	0.775
Third	0.80	0.775
Fourth	0.80	0.775
	$3.175	$3.025

Preferred dividends amounted to $0.6 million in 1978, equivalent to $2.75 per share. Quarterly dividends of $0.6875 per share have been paid regularly since issuance of the preferred shares in 1969.

Stock Prices

Monsanto's common stock (Symbol–MTC) is traded on the New York Stock Exchange and certain other major exchanges throughout the world. The Company's convertible preferred stock is also traded on the New York Stock Exchange.

The market prices on the New York Stock Exchange, as set forth below, indicate that quarterly highs and lows for the Company's common and preferred stocks were lower in 1978 than in 1977.

Common Stock Prices	1978		1977	
Quarter	High	Low	High	Low
First	57½	44⅛	88⅞	73⅜
Second	56¼	46⅜	82⅜	69⅛
Third	59¾	49⅝	70¼	58⅝
Fourth	60¼	47	60⅜	52

Convertible Preferred Stock Prices	1978		1977	
Quarter	High	Low	High	Low
First	58	50⅛	94½	82⅛
Second	60¼	51¾	91¼	77¼
Third	66¼	55	77	67½
Fourth	66⅝	53	64	58¼

While stock prices declined, as indicated above, average shareowners' equity per primary share increased to $68.25 in 1978 from $63.14 in 1977.

TOWOLDMON0014896

FINANCIAL REVIEW

(Dollars in millions, except per share)

OPERATING COMPANY DATA

Selected Financial Information

1978	Net Sales	Operating Income (Loss)	Total Assets	Depreciation, Obsolescence and Depletion	Capital Expenditures	Research and Development
Operating Company:						
Agricultural Products	$ 734.4	$303.8	$ 629.0	$ 34.6	$ 57.5	$ 26.9
Chemical Intermediates	523.2	75.1	849.8	36.2	185.7	15.8
Industrial Chemicals	1,290.1	218.7	849.6	61.1	88.2	34.0
Plastics & Resins	1,223.6	57.6	1,088.2	69.5	91.9	29.1
Textiles	963.2	(29.2)	1,050.1	80.6	44.5	25.0
Total Operating Companies	4,734.5	626.0	4,466.7	282.0	467.8	130.8
Fisher Controls	284.2	37.0	202.5	5.1	9.0	13.5
Total Operating Companies and Fisher Controls	5,018.7	663.0	4,669.2	287.1	476.8	144.3
Eliminations			(6.7)			
Unallocated Corporate Expenses		(31.3)		1.2		
Total Operating	5,018.7	631.7	4,662.5	288.3	476.8	144.3
Income charges–net		55.4				
Nonoperating assets			373.2		3.1	
Total Consolidated	$5,018.7	$576.3 (1)	$5,035.7	$288.3	$479.9	$144.3
1977						
Operating Company:						
Agricultural Products	$ 654.0	$274.3	$ 579.4	$ 29.9	$ 81.8	$ 19.6
Chemical Intermediates	522.0	128.0	735.9	42.4	209.8	16.2
Industrial Chemicals	1,156.4	211.9	750.3	49.4	87.1	30.1
Plastics & Resins	1,111.2	76.3	891.9	50.4	86.4	24.2
Textiles	884.3	(39.0)	1,011.2	82.0	126.8	25.6
Total Operating Companies	4,327.9	651.5	3,968.7	254.1	591.9	115.7
Fisher Controls	263.5	37.9	181.7	4.4	12.1	12.7
Total Operating Companies and Fisher Controls	4,591.4	689.4	4,150.4	258.5	604.0	128.4
Cycle-Safe Containers	3.1	(51.9)	17.2	36.5	1.4	3.9
Eliminations		(1.1)	(3.1)			
Unallocated Corporate Expenses		(26.7)		1.0		
Total Operating	4,594.5	609.7	4,164.5	296.0	605.4	132.3
Income charges–net		86.0				
Nonoperating assets			185.6		1.7	
Total Consolidated	$4,594.5	$523.7 (1)	$4,350.1	$296.0	$607.1	$132.3

(1) Income before income taxes

The principal product lines included in each operating company are shown in the "Sales by Product Group" data on page 42. Total sales between operating companies made on a market basis were $169.5 and $180.8 for 1978 and 1977 respectively. These sales were not significant for any operating company except Chemical Intermediates ($116.3 for 1978 and $129.5 for 1977) and Industrial Chemicals ($26.6 for 1978 and $24.0 for 1977).

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Unusual or nonrecurring charges or credits to 1978 and 1977 operating income were as follows: Plastics & Resins operating income for 1978 included a credit of $10.1 from the sale of the high density polyethylene business; Textiles and Plastics & Resins operating results for 1977 included $11.7 and $7.0 charges, respectively, related to terminating or divesting certain product lines; and, in 1977 a $35.6 charge related to the *Cycle-Safe* container.

Intercompany receivables and profit derived from intercompany sales were the principal items reflected as eliminations in arriving at the consolidated totals. Certain corporate expenses, primarily those related to the overall management of the Company, were not allocated to the operating companies. Nonoperating assets principally include cash, short-term securities, time deposits and investments.

WORLD AREA DATA

Selected Financial Information

	Net Sales				
	Outside Customers	Inter-Area	Operating Income	Total Assets	Capital Expenditures
1978					
United States	$3,631.1	$338.2	$630.7	$3,264.9	$337.9
Europe-Africa	848.2	56.9	15.2	1,147.7	114.7
Other Ex-USA	539.4	25.4	20.5	467.0	24.2
Eliminations		(420.5)	(3.4)	(217.1)	
Unallocated corporate expenses			(31.3)		
Total Operating	5,018.7	—	631.7	4,662.5	476.8
Income charges–net			55.4		
Nonoperating assets				373.2	3.1
Total Consolidated	$5,018.7	$ —	$576.3 (1)	$5,035.7	$479.9
1977					
United States	$3,409.5	$317.9	$614.1	$3,030.4	$424.6
Europe-Africa	706.0	43.4	8.5	910.8	162.7
Other Ex-USA	479.0	15.2	18.9	385.8	18.1
Eliminations		(376.5)	(5.1)	(162.5)	
Unallocated corporate expenses			(26.7)		
Total Operating	4,594.5	—	609.7	4,164.5	605.4
Income charges–net			86.0		
Nonoperating assets				185.6	1.7
Total Consolidated	$4,594.5	$ —	$523.7 (1)	$4,350.1	$607.1

(1) Income before income taxes

Inter-area sales, which are sales from one Monsanto location to another Monsanto location in a different world area, were made on a market basis. Export sales included in the United States net sales to outside customers were as follows:

	Europe	Other Ex-USA	Total
1978	$73.2	$236.9	$310.1
1977	49.6	198.8	248.4

Unusual or nonrecurring charges or credits to 1978 and 1977 operating income were as follows: United States operating income for 1978 included a credit of $10.1 from the sale of the high density polyethylene business; United States operating income for 1977 included a charge of $35.6 related to the *Cycle-Safe* container; Europe operating income for 1977 included a $12.2 charge for terminating or divesting certain product lines.

Inter-area receivables and profit derived from inter-area sales are the principal items reflected as eliminations in arriving at the consolidated totals. Unallocated corporate expenses and nonoperating assets are the same as those described for the Operating Company Data.

Following is a reconciliation of the Europe-Africa and Other Ex-USA operating income and total assets for 1978 and 1977 as shown above to the Company's equity in the net loss and net assets of consolidated Ex-USA subsidiaries:

	1978	1977		1978	1977
Operating income	$35.7	$27.4	Total assets	$1,614.7	$1,296.6
Income charges—net	80.5	81.0	Total liabilities	1,025.3	764.2
Income taxes	13.7	14.7			
Net loss	$58.5	$68.3	Net assets	$ 589.4	$ 532.4

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SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements have been prepared in accordance with generally accepted accounting principles applied on a consistent basis in all material respects. Where acceptable alternative accounting principles exist, Monsanto Company and Subsidiaries (Monsanto) have selected the methods they believe to be preferable in the circumstances. A summary of the significant alternative accounting principles selected follows.

Basis of Consolidation

The consolidated financial statements include Monsanto Company (Company) and its majority-owned subsidiaries (Subsidiaries). All significant intercompany transactions have been eliminated. During 1978, Monsanto acquired an additional 17 percent of Aiscondel, S.A., a Spanish corporation, in which Monsanto had a previous investment of 50 percent. This Spanish corporation, formerly accounted for as an equity affiliate, is now included in the consolidated financial statements as a subsidiary company.

Investments in the common stock of certain affiliates, in which Monsanto has a greater than 20 percent interest, but which are not majority-owned, are accounted for by the equity method.

Depreciation

Monsanto generally uses the straight line method of computing depreciation on assets; however, the sum of the years digits method is used on most domestic assets placed in service prior to January 1, 1972.

Income Taxes

Monsanto follows the "flow through" method of accounting for investment tax credits. Under this method, benefits are recognized as a reduction of income taxes in the year they are realized by an offset to the Federal income tax liability.

Income taxes on the undistributed earnings of foreign subsidiaries have not been provided, but any taxes on dividends would be substantially offset by foreign tax credits. Income taxes on domestic international sales corporations (DISC's) have not been provided because Monsanto intends to indefinitely reinvest these earnings.

Inventory Valuation

Inventories are stated at the lower of cost or market. The method of determining cost for substantially all domestic inventories is last-in, first-out (LIFO). The method of determining cost for other inventories is generally first-in, first-out (FIFO).

Pension Plans

Pension costs include charges applicable to current service and amortization of unfunded prior service costs over periods ranging from 15 to 30 years. Monsanto's policy is to fund pension costs accrued.

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Monsanto Company and Subsidiaries

STATEMENT OF CONSOLIDATED INCOME

(Dollars in millions, except per share)

	Year 1978	Year 1977
Net Sales	**$5,018.7**	$4,594.5
Cost of Goods Sold	**3,743.6**	3,409.7
Marketing and Administrative Expenses	**453.2**	399.6
Technological Expenses	**190.2**	175.5
	4,387.0	3,984.8
Operating Income	**631.7**	609.7
Income Charges (Credits):		
Interest expense	**102.8**	86.0
Other—net	**(47.4)**	
	55.4	86.0
Income Before Income Taxes	**576.3**	523.7
Income Taxes	**273.7**	248.1
Net Income	**$ 302.6**	$ 275.6
Earnings per Common Share:		
Primary	**$ 8.29**	$ 7.46
Fully diluted	**8.21**	7.37

The above statement should be read in conjunction with page 52 and pages 58 through 65 of this report.

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Monsanto Company and Subsidiaries

STATEMENT OF CONSOLIDATED FINANCIAL POSITION

(Dollars in millions, except per share)

ASSETS	Dec. 31, 1978	Dec. 31, 1977
Current Assets:		
Cash	$ 65.4	$ 38.3
Short-term securities and time deposits, at cost which approximates market	282.2	160.0
Receivables, net of allowances of $32.2 in 1978 and $19.1 in 1977	1,112.0	810.7
Inventories	720.8	726.4
	2,180.4	1,735.4
Investments and Miscellaneous Assets:		
Investments in affiliates	118.5	109.2
Miscellaneous investments and receivables	48.9	37.1
	167.4	146.3
Property, Plant and Equipment, at Cost:		
Land	49.1	45.0
Buildings	612.0	573.3
Machinery and equipment	4,245.4	3,914.5
Mineral rights and oil and gas properties	260.4	212.3
	5,166.9	4,745.1
Less accumulated depreciation and depletion and government grants	2,562.1	2,336.4
	2,604.8	2,408.7
Deferred Charges	83.1	59.7
	$5,035.7	$4,350.1

The above statement should be read in conjunction with page 52 and pages 58 through 65 of this report.

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TOWOLDMON0014901

LIABILITIES AND SHAREOWNERS' EQUITY	Dec. 31, 1978	Dec. 31, 1977
Current Liabilities:		
Accounts payable and accruals	$ 801.1	$ 551.8
Income taxes	39.7	50.1
Current portion of long-term debt	43.9	53.5
	884.7	655.4
Long-Term Debt	1,223.5	1,030.6
Other Liabilities and Deferred Credits:		
Deferred income taxes	312.5	236.0
Miscellaneous	35.6	27.2
	348.1	263.2
Shareowners' Equity:		
Preferred stock—authorized, 10,000,000 shares without par value, issuable in series; outstanding, 185,112 shares in 1978 and 271,306 shares in 1977; involuntary liquidation preference, $35 per share, or an aggregate of $6.5 in 1978 and $9.5 in 1977	0.4	0.6
Common stock—authorized, 100,000,000 shares, par value $2 each; issued, 36,976,516 shares in 1978 and 36,872,323 shares in 1977	73.9	73.7
Additional contributed capital	651.5	650.6
Reinvested earnings	1,892.5	1,705.3
	2,618.3	2,430.2
Less common stock in treasury, at cost (786,653 shares in 1978 and 591,603 shares in 1977)	38.9	29.3
	2,579.4	2,400.9
	$5,035.7	$4,350.1

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Monsanto Company and Subsidiaries

STATEMENT OF CHANGES IN CONSOLIDATED FINANCIAL POSITION

(Dollars in millions)

	Year 1978	Year 1977
Source of Working Capital:		
Net income	$ 302.6	$ 275.6
Charges not affecting working capital:		
Depreciation, obsolescence and depletion	288.3	296.0
Deferred income taxes	76.5	54.7
Other—net	24.8	28.4
Working capital from operations	692.2	654.7
Outside financing—net of unexpended funds from industrial development bonds	284.9	126.3
Property disposals	47.3	26.9
Proceeds from issuance of capital stock	0.4	2.0
	1,024.8	809.9
Application of Working Capital:		
Property, plant and equipment additions	479.9	607.1
Dividends	115.4	111.4
Debt reduction	133.2	79.0
Other—net	80.6	38.3
	809.1	835.8
Increase (Decrease) in Working Capital	$ 215.7	$ (25.9)
Changes in Elements of Working Capital:		
Increase (decrease) in current assets:		
Cash, short-term securities and time deposits	$ 149.3	$(121.9)
Net receivables	301.3	79.6
Inventories	(5.6)	94.6
	445.0	52.3
(Increase) decrease in current liabilities:		
Accounts payable and accruals	(249.3)	(34.2)
Income taxes	10.4	(15.8)
Current portion of long-term debt	9.6	(28.2)
	(229.3)	(78.2)
Increase (Decrease) in Working Capital	$ 215.7	$ (25.9)

The above statement should be read in conjunction with page 52 and pages 58 through 65 of this report.

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TOWOLDMON0014903

Monsanto Company and Subsidiaries

STATEMENT OF CONSOLIDATED SHAREOWNERS' EQUITY

(Dollars in millions, except per share)

	Preferred Stock	Common Stock	Additional Contributed Capital	Reinvested Earnings	Treasury Stock
Balance, January 1, 1977	$0.8	$73.4	$648.2	$1,541.1	$(11.0)
Net income				275.6	
Dividends:					
Preferred—$2.75 per share				(0.9)	
Common—$3.025 per share				(110.5)	
Conversion of $2.75 Preferred Stock to common stock	(0.2)	0.2			
Shares issued under stock option plans		0.1	1.7		
Shares issued upon conversion of Monsanto Limited convertible loan stock			0.2		
Shares purchased					(18.3)
Other			0.5		
Balance, December 31, 1977	0.6	73.7	650.6	1,705.3	(29.3)
Net income				**302.6**	
Dividends:					
Preferred—$2.75 per share				**(0.6)**	
Common—$3.175 per share				**(114.8)**	
Conversion of $2.75 Preferred Stock to common stock	**(0.2)**	**0.2**			
Shares issued under employee stock ownership and option plans			**0.8**		**3.2**
Shares purchased					**(12.8)**
Other			**0.1**		
Balance, December 31, 1978	**$0.4**	**$73.9**	**$651.5**	**$1,892.5**	**$(38.9)**

The above statement should be read in conjunction with page 52 and pages 58 through 65 of this report.

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NOTES TO FINANCIAL STATEMENTS

(Dollars in millions, except per share)

Bank Credit Arrangements

At December 31, 1978, Monsanto had $150.0 of open domestic short-term lines of credit and $150.0 committed under a Revolving Credit/Term Loan Agreement with twenty-one banks. The open domestic short-term lines of credit are renewable annually and any loans thereunder bear interest at the prime commercial rate of the various banks. The Revolving Credit/Term Loan Agreement provides for a four-year revolving credit, with any outstanding borrowings at the end of that period convertible into a three-year term loan. Interest on borrowings under the revolving credit is at the prime commercial rate and interest on borrowings under the term loan is one quarter percent above the prime rate. No borrowings were made under any of the arrangements through March 5, 1979.

In addition, certain foreign subsidiaries have short-term loan facilities aggregating approximately $306.8. Short-term loans outstanding as of December 31, 1978 totaled $142.8. Interest is related to the various bank rates, primarily the London interbank sterling market rate.

Capital Stock

The outstanding preferred stock is stated at $2.24 per share, has a cumulative dividend of $2.75 per share and is convertible into the Company's common stock. The conversion rate of 1.12 shares of common for each share of preferred is subject to adjustment in certain events under antidilution provisions. Preferred shares of 86,194 and 111,281 were converted into 96,505 and 124,561 common shares during 1978 and 1977, respectively. Of 2,330,510 total preferred shares originally issued in the period 1969 through 1974, 2,145,398 preferred shares have been converted to 2,402,538 shares of common stock through December 31, 1978. The outstanding preferred stock may be redeemed solely at the Company's option at $73 per share (the voluntary liquidation preference).

The Company issued 2,096 shares of common stock in 1977 to holders of convertible loan stock issued by Monsanto Limited, a United Kingdom subsidiary, upon exercise of their conversion rights. No common shares were issued to holders of convertible loan stock in 1978. In addition, no common shares were issued in 1978 or 1977 to holders of convertible debentures issued by Monsanto International Finance Company.

The Company held 81,882 shares of its common stock for specific purposes which are included in Miscellaneous Investments in the accompanying Statement of Consolidated Financial Position at December 31, 1978.

There were 3,073,261 shares of common stock reserved for the following purposes at December 31, 1978:

	Shares
Conversion of $2.75 Preferred Stock	207,325
Stock option plans	2,427,297
Conversion of convertible loan stock of Monsanto Limited	258,313
Conversion of debentures of Monsanto International Finance Company	180,326
	3,073,261

Depreciation, Obsolescence and Repairs

Charges to expense were:

	1978	1977
Depreciation, amortization and depletion	$265.5	$239.5
Obsolescence	22.8	56.5
	$288.3	$296.0
Repairs and maintenance	$349.5	$289.3

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Earnings per Common Share

Income and the number of shares used in the computation of earnings per common and common equivalent share were determined as follows:

	1978		1977	
Income	Primary	Fully Diluted	Primary	Fully Diluted
Net income	$302.6	$302.6	$275.6	$275.6
Preferred dividends	(0.6)		(0.9)	
Interest (less tax) on:				
Loan stock of Monsanto Limited	0.3	0.3	0.2	0.2
Debentures of Monsanto International Finance Company		0.4		0.5
	$302.3	$303.3	$274.9	$276.3
Number of Shares (In thousands)				
Weighted average shares:				
Outstanding	36,212	36,212	36,511	36,511
Incremental shares for outstanding stock options	9	11	67	69
Shares issuable upon conversion:				
Loan stock of Monsanto Limited	259	259	259	259
Debentures of Monsanto International Finance Company		194		237
$2.75 Preferred Stock		248		352
	36,480	36,924	36,837	37,428

Employee Stock Options

The status of the authorized common shares for the stock option plans and the changes occurring during 1978 were:

	1974 Plan		1969 Plan
	Outstanding	Authorized Not Granted	Outstanding
At January 1, 1978	734,500	168,742	132,243
Additional authorization		1,400,000	
Granted	244,650	(244,650)	
Exercised	(2,488)		(5,200)
Terminated	(32,421)	32,421	(500)
At December 31, 1978	944,241	1,356,513	126,543

Under the above plans, options for 1,070,784 shares were outstanding at December 31, 1978 at prices ranging from $32.50 to $92.88 per share, or a weighted average of $65.23 per share. During the year, options for 7,688 shares were exercised at prices ranging from $32.50 to $52.94 per share.

The additional shares authorized under the 1974 Plan were approved by the stockholders at the 1978 Annual Meeting. At that meeting, stock appreciation rights were authorized to be granted at the same time the related non-qualified options under the 1974 Plan are granted. Stock appreciation rights may also be granted retroactively for any unexercised non-qualified options under either the 1974 or 1969 Plans. At December 31, 1978, stock appreciation rights with respect to options for 279,349 shares were granted and outstanding. No stock appreciation rights were exercisable or terminated during 1978.

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TOWOLDMON0014906

NOTES TO FINANCIAL STATEMENTS

(Dollars in millions, except per share)

Equity in Affiliates

The equity of Monsanto in the net loss of affiliates totaled $10.1 and $12.5 in 1978 and 1977, respectively, and is included in other income charges–net.

Foreign Exchange

Net exchange losses resulting from foreign currency transactions and translation of foreign currency financial statements were $28.3 and $36.9 in 1978 and 1977, respectively.

Income Taxes

The components of income tax expense were:

	1978	1977
Current:		
Federal (after investment tax credits of $28.0 in 1978 and $38.3 in 1977)	$164.3	$172.3
State	16.8	13.4
Foreign	16.1	7.7
	197.2	193.4
Deferred:		
Federal	69.3	45.9
State	6.1	
Foreign	1.1	8.8
	76.5	54.7
	$273.7	$248.1

The source of timing differences in the recognition of revenue and expense for tax and financial statement purposes and the tax effect of each were:

	1978	1977
Excess of depreciation for tax purposes over book	$56.6	$49.6
Other items—net	19.9	5.1
	$76.5	$54.7

Income tax expense was less than the Federal statutory rate because of the factors indicated below:

	1978	1977
Statutory corporate tax rate	48.0%	48.0%
Investment tax credit	(4.9)	(7.3)
Tax treatment afforded earnings of DISC's	(2.9)	(2.1)
Non-tax effected losses of foreign subsidiaries	6.0	7.3
State and local income taxes and other	1.3	1.5
	47.5%	47.4%

Undistributed earnings of foreign subsidiaries and DISC's for which Federal income taxes are not provided were:

	1978	1977
Foreign subsidiaries	$ 80.0	$141.1
DISC's	159.5	124.8
	$239.5	$265.9

Foreign net operating loss carryforwards for which no tax benefits have been recorded are approximately $152.4 at December 31, 1978 and expire in various years principally from 1979 through 1983.

DSM 021201

TOWOLDMON0014907

Inventory Valuation

Inventories at December 31, 1978 and 1977 would have been $258.2 and $229.8, respectively, higher than reported if the FIFO basis of inventory valuation (which approximates replacement cost) had been used for all inventories.

Key Employee Bonus

Data relating to the Monsanto Management Incentive Plan of 1974 were:	1978	1977
Maximum allowable addition to bonus reserve	$14.5	$17.4
Actual charge to expense (and addition to bonus reserve) as determined by the Executive Compensation and Development Committee	$ 8.4	$ 5.2
Bonus awards:		
Number of directors and officers	25	23
Number of other key employees	471	454
Amount	$ 9.5	$ 4.2
Balance in bonus reserve at year-end	$ 6.7	$ 7.9

The bonus award amount for 1978 includes a five-year accumulated award payment to 36 officers and employees of $1.6 for the long-term incentive program established under the Monsanto Management Incentive Plan of 1974.

Leases, Guarantees and Other Commitments

Monsanto was contingently liable as guarantor of bank loans and for customers' receivables discounted aggregating approximately $92.5 at December 31, 1978.

Commitments in connection with uncompleted additions to property aggregated approximately $146.2 at December 31, 1978.

Rent expense under operating leases with a remaining term of more than one month was approximately $54.9 in 1978 and $41.1 in 1977.

Minimum rental commitments under non-cancelable operating leases are approximately:

1979	$12.1
1980	9.0
1981	6.8
1982	4.2
1983	2.9
After 1983	29.3
	$64.3

Legal Proceedings

Monsanto is party to a number of lawsuits arising in the normal course of business. The more significant pending lawsuits are described below.

The Company is a defendant in various lawsuits alleging damages from products containing polychlorinated biphenyls (PCB's). Some of these lawsuits purport to be class actions, among which are the following: three actions purport to be on behalf of those having alleged interests, such as ownership of property, business operations or utilization of certain water bodies as a source of food or a means of recreation, connected with the Coosa River and its tributaries and Weiss Lake located between the States of Georgia and Alabama. These suits were filed in the U.S. District Court for the Northern District of Georgia on September 20, 1976, the Superior Court of Fulton County, State of Georgia, on September 24, 1976, and the U.S. District Court for the Northern District of Alabama on December 29, 1976. Damages claimed in each of the first two of these suits are $500.0, and in the last is $1,000.0. The State of Alabama, through its Attorney General, has intervened in the Northern District of Alabama suit seeking $100.0 actual damages, $0.1 punitive damages and restoration and clean-up costs. These lawsuits claim that Monsanto failed to warn of the alleged dangers of PCB's. In the Georgia federal district court case described above, the court denied certification as a class action and remanded to state court certain plaintiffs who allege damages of less than $0.1. In the Alabama federal district court case described above, the court denied certification as a class action. The Company will vigorously defend all such lawsuits.

While the results of litigation cannot be predicted with certainty, management, based upon advice of counsel, believes that the final outcome of such litigation will not have a materially adverse effect on the consolidated financial statements of Monsanto.

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NOTES TO FINANCIAL STATEMENTS

(Dollars in millions, except per share)

Long-Term Debt

At December 31, 1978 and 1977, long-term debt, exclusive of current maturities and repayable in U.S. dollars, except where parenthetically or otherwise indicated, was as follows:

	1978	1977
Monsanto Company:		
7½% promissory notes due 1980/1985	$ 14.3	$ 14.6
8% notes due 1985	100.0	100.0
4¾% promissory notes due 1993	67.3	67.3
8½% sinking fund debentures due 2000	175.0	175.0
9⅛% sinking fund debentures due 2000	114.0	125.3
3¾% income debentures due 2002	91.0	91.0
4⅘%-7½% industrial development bond obligations due 1983/2008	134.2	124.2
4¼% income debentures due 2008	50.0	50.0
8¾% sinking fund debentures due 2008	200.0	
Capitalized lease obligations	14.1	15.6
Other:		
U.S. dollar	1.4	1.4
West German deutsche mark	5.6	9.8
Monsanto International Finance Company:		
4½% sinking fund debentures due 1985 (a)	15.0	17.5
Monsanto International N.V. (Netherlands Antilles subsidiary):		
8¾% sinking fund debentures due 1985	4.6	7.4
5½% bonds due 1987 (Swiss franc)		39.2
Monsanto Limited (United Kingdom subsidiary) (British pound):		
5% loan stock due 1982/1986 (b)	12.1	11.2
Other	29.4	31.5
Monsanto (Suisse) S.A. (Swiss subsidiary) (Swiss franc):		
6¾% sinking fund debentures due 1985	16.1	14.7
6½% sinking fund debentures due 1986	29.8	24.5
Monsanto Europe, S.A. (Belgian subsidiary) (Belgian franc):		
9% bank loan due 1980/1986	1.2	17.7
9¾%-11³⁄₂₀% bank loans due 1980/1988 (c)	100.2	48.7
9¾% bonds due 1982/1991	13.9	11.8
Other		8.2
Aiscondel, S.A. (Spanish subsidiary):		
9%-19½% bank and commercial loans due 1980/2015:		
U.S. dollar	17.3	
Spanish peseta	11.0	
Other:		
Australian dollar	0.8	8.5
French franc	0.2	6.4
Other currencies	5.0	9.1
Total	$1,223.5	$1,030.6

Notes:

(a) These debentures are currently convertible into the Company's common stock at $86 per share, subject to adjustment under certain conditions.

(b) This loan stock is convertible into the Company's common stock at a rate equivalent to $55 per share, subject to adjustment under certain conditions.

Of the total loan stock originally issued in 1969, 45% has been retired through December 31, 1978 by conversion into 212,959 shares of the Company's common stock.

(c) The interest rates on these bank loans will be reduced by a government subsidy ranging from 4.0%-2.8%, which expires in 1980/1981. Monsanto has the option of repaying these loans in 1981.

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Maturities and sinking fund requirements on long-term debt are $43.9, $38.7, $42.4, $63.4, and $40.3 for the five years ending December 31, 1979 through 1983, respectively.

Covenants of certain loan agreements restrict maximum borrowings. It is not anticipated that additional future borrowings will be affected by these restrictions.

Under various parallel loan agreements, Monsanto has borrowed $90.3 in pounds sterling from United Kingdom (U.K.) companies and has made United States (U.S.) dollar loans to the U.K. companies or their subsidiaries aggregating $85.8 as of December 31, 1978. These agreements require Monsanto to make additional U.S. dollar loans of $4.5, which amount is reflected as a current liability. As both parties to the agreements have the legal right to offset in case of default by the other party, the parallel transactions are reflected net in the accompanying financial statements. Interest rates on the sterling loans are 2¼% to 2½% higher than the interest rates on the corresponding dollar loans. Maturity dates of the loans range from 1982 through 1986.

Substantially all the long-term debt shown in the above table for each individual subsidiary company is guaranteed by the Company.

Pension Plans

Several noncontributory pension plans provide retirement benefits for substantially all employees of Monsanto. The expense related to these pension plans was $84.2 in 1978 and $74.6 in 1977.

The estimated actuarially computed value of vested benefits of the major plans exceeded the market value of the plans' assets by $5.4 as of December 31, 1978.

Replacement Cost Data (Unaudited)

Monsanto's financial statements are prepared in accordance with generally accepted accounting principles, which include the concept of historical cost. Under this concept, assets generally are recorded and reported at the amounts originally paid despite subsequent changes in (1) the purchasing power of the dollar, (2) the amount for which the asset could be sold–its market value –or (3) the current cost of replacing the asset–its replacement cost.

In an attempt to begin providing readers of financial statements with information as to the "current economics" of businesses, the Securities and Exchange Commission established rules in 1976 that require some companies–Monsanto is one–to estimate and report certain replacement cost data. Under these rules, the estimated impact of replacement cost on the amounts reported in the accompanying (historical cost) financial statements for inventories; property, plant and equipment; cost of goods sold; and depreciation expense is to be disclosed. These disclosures do not take into account the impact of replacement cost on other assets, liabilities, revenues or expenses reported in the accompanying financial statements.

Based on the best estimates of management, use of the replacement cost basis would impact the amounts reported in the consolidated financial statements in the following manner:

- Inventories determined on a FIFO basis approximate the estimated replacement cost.
- Buildings and machinery and equipment would have been more than reported in the historical cost financial statements by approximately $2,700 for 1978 and $2,000 for 1977. After adjusting for accumulated depreciation, the net building and machinery and equipment would have been higher than reported on a historical cost basis by approximately $1,200 for 1978 and $1,000 for 1977.
- Depreciation expense would have been higher than the reported historical cost depreciation by approximately $195 for 1978 and $164 for 1977.
- Cost of goods sold, excluding the impact of replacement cost depreciation, would have been approximately the same as on a historical cost basis.

The replacement cost amounts for 1977 shown above have been revised to be consistent with the computation of the 1978 data. A statement of the procedures used to estimate the replacement cost data and management's concerns with respect to the reliability of such data, as well as certain other information with respect to the replacement cost data, is contained in the Company's Form 10-K filed with the Securities and Exchange Commission for 1978. A copy of the Form 10-K Report is available from the Company on request.

OSW 021204

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NOTES TO FINANCIAL STATEMENTS

(Dollars in millions, except per share)

Segment Information

Financial Accounting Standards Board Statement No. 14 requires disclosure of certain industry and world area "segment" data. Accordingly, the Operating Company and World Area Data for 1978 and 1977 appearing on pages 50 and 51 of the Financial Review Section of this Annual Report are integral parts of the accompanying financial statements.

Selected Quarterly Financial Data (Unaudited)

Selected unaudited quarterly financial data for 1978 and 1977 follow:

	Net Sales	Cost of Goods Sold	Net Income	Earnings per Common Share	
				Primary	Fully Diluted
1978:					
First Quarter	**$1,342.7**	**$ 903.4**	**$135.7**	**$3.71**	**$3.67**
Second Quarter	**1,185.0**	**885.1**	**76.1**	**2.09**	**2.07**
Third Quarter	**1,187.0**	**918.5**	**46.8**	**1.28**	**1.27**
Fourth Quarter	**1,304.0**	**1,036.6**	**44.0**	**1.21**	**1.20**
Year	**$5,018.7**	**$3,743.6**	**$302.6**	**$8.29**	**$8.21**
1977:					
First Quarter	$1,306.1	$ 871.2	$147.9	$4.01	$3.95
Second Quarter	1,122.1	819.4	81.5	2.21	2.18
Third Quarter	1,075.8	872.3	24.9	0.66	0.66
Fourth Quarter	1,090.5	846.8	21.3	0.58	0.58
Year	$4,594.5	$3,409.7	$275.6	$7.46	$7.37

The 1978 operating results include the following effects of foreign currency losses: first quarter $12.8 ($0.35 per primary share); second quarter $2.7 ($0.07 per primary share); third quarter $12.5 ($0.35 per primary share); fourth quarter $4.5 ($0.12 per primary share).

In addition, third-quarter 1978 operating results include a gain of $7.1 ($0.20 per primary share) related to the sale of the high density polyethylene business.

The 1977 operating results include the following effects of foreign currency losses: first quarter $3.8 ($0.10 per primary share); second quarter $8.0 ($0.22 per primary share); third quarter $0.4 ($0.01 per primary share); fourth quarter $22.0 ($0.60 per primary share).

First- and third-quarter 1977 operating results include charges of $1.9 ($0.05 per primary share) and $18.5 ($0.50 per primary share), respectively, related to the *Cycle-Safe* container, as further explained in "Write-down of Net Investment in *Cycle-Safe*."

The 1977 third quarter operating results also include a charge of $13.1 ($0.36 per primary share) for anticipated losses due to terminating or divesting certain product lines.

Subsequent Event

On February 28, 1979, Monsanto signed an agreement with The General Electric Company Limited (GEC), an English limited company, that provides for the formation of a new corporation consisting of Fisher Controls Company, Inc., a wholly owned subsidiary of the Company engaged in the manufacture of valves, regulators, controllers and process controls instrumentation, and similar operations of GEC. The new corporation formed by this transaction, Fisher Controls Corporation of Delaware (FCCD), issued common stock in exchange for all the outstanding common stock of Fisher Controls Company, Inc. and for certain of the GEC operations. GEC received 335 (33.5%) of the outstanding common shares of FCCD and Monsanto received the remaining 665 (66.5%) outstanding common shares. The effective date of the transaction, which will be accounted for under the purchase method, was specified as January 1, 1979.

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Technological Expenses

Technological expenses consisted of the following:

	1978	1977
Research and development	$144.3	$132.3
Engineering, commercial development and patent	45.9	43.2
	$190.2	$175.5

Write-Down of Net Investment in *Cycle-Safe*

Following a February 1977 announcement by the Food and Drug Administration (FDA) of its intention to suspend the food additive regulations permitting the use of acrylonitrile copolymers in the fabrication of plastic containers for carbonated beverages, Monsanto suspended production of its acrylonitrile/styrene copolymer *Cycle-Safe* container. In September 1977, the FDA issued a final decision prohibiting the use of acrylonitrile to make plastic beverage containers. Included in cost of goods sold for 1977 are charges of $35.6 resulting from the write-down of the net investment in *Cycle-Safe* container operations and related expenses. These charges reduced 1977 earnings by $20.4 net of income taxes, or $0.55 per primary share. At December 31, 1978, the original estimated liability for write-down of the net investment was reduced to $12.6 as a result of actual expenditures related to the suspended operations and dispositions of certain assets. The remaining liability is estimated to be sufficient to absorb any additional costs.

Management continues to believe that the use of the *Cycle-Safe* container poses no health hazards but, rather, possesses considerable positive environmental and consumer convenience attributes. During 1978, the Company filed a petition in the U.S. Court of Appeals for the District of Columbia seeking review of the FDA's decision to prohibit the use of acrylonitrile copolymers in plastic soft drink bottles. This proceeding is still pending.

Accountants' Opinion

DELOITTE HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS

TEN BROADWAY
SAINT LOUIS 63102

Monsanto Company:

We have examined the accompanying consolidated financial statements (pages 52 through 65) of Monsanto Company and Subsidiaries for the years ended December 31, 1978 and 1977. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the consolidated financial position of Monsanto Company and Subsidiaries at December 31, 1978 and 1977 and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

March 5, 1979

Deloitte Haskins & Sells

DSW 021206

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Monsanto Company and Subsidiaries

TEN-YEAR SUMMARY

(In millions, except per share and where italicized)

	1978	1977
Operating Results		
Net sales	$5,019	$4,595
Operating income	632	610
Interest expense	103	86
Income taxes	274	248
Income before extraordinary items	303	276
Extraordinary charges (credits)—net		
Net income	303	276
Percent of net sales	*6.0%*	*6.0%*
Percent of average shareowners' equity	*12.2%*	*11.9%*
Earnings per common share:		
Primary:		
Before extraordinary items	$ 8.29	$ 7.46
After extraordinary items	8.29	7.46
Fully diluted:		
Before extraordinary items	8.21	7.37
After extraordinary items	8.21	7.37
Year-End Financial Position		
Total assets	$5,036	$4,350
Working capital	1,296	1,080
Property, plant and equipment—gross	5,167	4,745
Property, plant and equipment—net	2,605	2,409
Long-term debt	1,224	1,031
Shareowners' equity	2,579	2,401
Other Data		
Per common share:		
Dividends	$ 3.175	$ 3.025
Shareowners' equity	71.26	66.16
Property, plant and equipment additions	$ 480	$ 607
Depreciation, obsolescence and depletion	288	296
Year-end:		
Shareowners:		
Common	*86,775*	*85,021*
Preferred	*1,156*	*1,404*
Common shares outstanding	36.2	36.3
Employees	*62,851*	*61,519*

(1) As of January 1, 1974, the Company and certain of its domestic subsidiaries changed their method of inventory valuation for substantially all United States inventories from the FIFO basis to the LIFO basis. The effect of this change was to decrease 1974 income by $77.5 or $2.26 per primary share.
(2) Excludes $16.0 applicable to extraordinary charges.

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1976	1975	1974	1973	1972	1971	1970	1969
$4,270	$3,625	$3,498	$2,648	$2,225	$2,087	$1,972	$1,939
668	547	550	406	216	178	128	191
80	56	43	39	37	39	33	22
251	230	251	173	81	66	35	73
366	306	323(1)	238	122	94	78	109
						11	(7)
366	306	323(1)	238	122	94	67	116
8.6%	*8.4%*	*9.2%*	*9.0%*	*5.5%*	*4.5%*	*3.4%*	*6.0%*
17.3%	*16.4%*	*20.0%*	*17.2%*	*9.7%*	*7.8%*	*5.6%*	*9.8%*
$10.05	$ 8.63	$ 9.25	$ 6.90	$ 3.49	$ 2.65	$ 2.17	$ 3.08
10.05	8.63	9.25	6.90	3.49	2.65	1.83	3.28
9.77	8.22	8.73	6.54	3.40	2.63	2.17	3.03
9.77	8.22	8.73	6.54	3.40	2.63	1.83	3.21
$3,959	$3,451	$2,938	$2,545	$2,237	$2,154	$2,145	$2,012
1,106	1,150	968	855	677	547	538	510
4,208	3,620	3,157	2,852	2,765	2,735	2,637	2,471
2,090	1,660	1,312	1,152	1,133	1,170	1,170	1,071
915	845	587	579	576	558	589	454
2,253	1,977	1,755	1,484	1,294	1,226	1,194	1,205
$ 2.75	$ 2.55	$ 2.30	$ 1.90	$ 1.80	$ 1.80	$ 1.80	$ 1.80
61.79	56.62	51.39	44.26	39.05	37.16	36.27	36.25
$ 647	$ 528	$ 313	$ 205	$ 168	$ 205	$ 301	$ 220
226	173	172	170	194	187	170(2)	164
84,647	*91,725*	*98,542*	*98,964*	*104,369*	*110,490*	*121,399*	*118,156*
1,956	*2,836*	*3,709*	*3,855*	*3,939*	*3,897*	*3,941*	*3,621*
36.4	34.8	34.1	33.4	33.0	32.8	32.8	33.1
61,903	*59,242*	*60,926*	*58,277*	*57,891*	*59,271*	*62,940*	*64,604*

TOWOLDMON0014914

DIRECTORS AND OFFICERS

DIRECTORS

John W. Hanley, St. Louis
Chairman of the Board and President

H. Harold Bible, St. Louis
Vice Chairman of the Board

Edmond S. Bauer, St. Louis
Chairman of the Board and President,
Fisher Controls Corporation
of Delaware

Donald C. Carroll, Philadelphia
Dean of The Wharton School
University of Pennsylvania

C. R. Dahl, San Francisco
Chairman of the Board,
Crown Zellerbach Corporation

John R. Eck, St. Louis
Senior Vice President

Louis Fernandez, St. Louis
Executive Vice President

J. W. Fisher, Marshalltown, Ia.
Former Chairman of the Board,
Fisher Controls Company, Inc.

Richard I. Fricke, Montpelier, Vt.
President,
National Life Insurance Company

James J. Kerley, St. Louis
Executive Vice President

Howard M. Love, Pittsburgh
President,
National Steel Corporation

Jean Mayer, Medford, Ma.
President, Tufts University

Buck Mickel, Greenville, S.C.
Chairman of the Board,
Daniel International Corporation,
a subsidiary of Fluor Corporation

Edward L. Palmer, New York
Chairman of the Executive
Committee,
Citicorp and Citibank, N.A.

Francis E. Reese, St. Louis
Group Vice President

Tom K. Smith Jr., St. Louis
Senior Vice President

Charles H. Sommer, St. Louis
Former Monsanto Chairman
of the Board

Monte C. Throdahl, St. Louis
Group Vice President

Margaret Bush Wilson, St. Louis
Attorney,
Wilson, Smith, Wunderlich & Smith

COMMITTEES OF THE BOARD OF DIRECTORS

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Edward L. Palmer
Margaret Bush Wilson

Executive
Edmond S. Bauer
H. Harold Bible
John W. Hanley
James J. Kerley
Charles H. Sommer
Margaret Bush Wilson

Executive Compensation and Development
C. R. Dahl
Richard I. Fricke
Howard M. Love
Buck Mickel
Charles H. Sommer

Finance
J. W. Fisher
John W. Hanley
James J. Kerley
Buck Mickel
Edward L. Palmer
Charles H. Sommer

Nominating
C. R. Dahl
John W. Hanley
James J. Kerley
Howard M. Love
Buck Mickel

Pension and Savings Funds
H. Harold Bible
Donald C. Carroll
Richard I. Fricke
James J. Kerley
Jean Mayer

OFFICERS

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Vice Chairman of the Board
H. Harold Bible

Executive Vice Presidents
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James J. Kerley
Richard J. Mahoney

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Tom K. Smith Jr.

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James E. Crawford Jr.
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Earle H. Harbison Jr.
Nicholas L. Reding
Francis E. Reese
Monte C. Throdahl
J. Virgil Waggoner

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S. Allen Heininger
Joseph T. Nolan
Ernest S. Robson Jr.

Vice President, Secretary and General Counsel
Richard W. Duesenberg

Vice President and Treasurer
Richard C. O'Sullivan

Vice President and Controller
Francis A. Stroble

Regional Vice President
Sam Pickard

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TOWOLDMON0014915

Transfer Agents

Morgan Guaranty Trust Company
of New York
The Boatmen's National Bank
of St. Louis

Registrars

The Chase Manhattan Bank, N.A.
St. Louis Union Trust Company

DSW 021210

Monsanto Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

DSW 021211