Financial Highlights 3
To Our Stockholders 4
Innovation 7
Business Performance 25
Financials 33
Organization, Directors and Officers, Committees 54
Investor Information 56

FINANCIAL HIGHLIGHTS

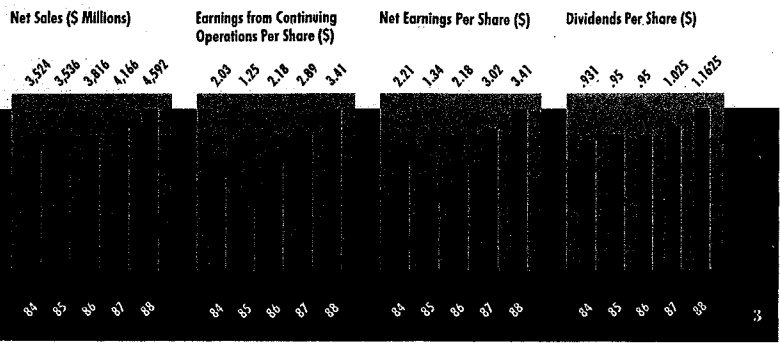
American Cyanamid Company and Subsidiaries

(Dollars in millions except per share amounts)

Operating Results	1988	1987	1986
Net sales	**$4,592.0**	$4,166.1	$3,815.9
Earnings from continuing operations	**305.6**	264.0	202.5
Net earnings	**305.6**	275.6	202.5
Dividends	**104.3**	93.4	88.2
Per share of common stock:			
Earnings from continuing operations	**3.41**	2.89	2.18
Net earnings	**3.41**	3.02*	2.18
Dividends	**1.1625**	1.025	.95
Depreciation, depletion and amortization	**221.2**	200.8	190.2
Additions to plants, equipment and facilities	**373.8**	268.1	262.5
Research and process development expense	**365.1**	313.6	278.3

Year-End Position			
Total assets	**$4,593.1**	$4,129.0	$3,667.0
Funded debt	**481.4**	563.1	584.3
Stockholders' equity	**2,062.0**	1,873.0	1,720.6
Per share of common stock	**23.02**	20.85	18.71
December 31, closing stock price on the New York Stock Exchange Composite Listing	**46¾**	41¼	38⅞
Shares outstanding	**89,583,192**	89,829,165	91,977,950
Number of stockholders	**52,662**	51,304	53,041
Number of employees	**35,501**	34,267	34,462

*Includes a gain of approximately $.13 from the sale of the Jacqueline Cochran businesses and a $.13 gain from discontinued operations. Excluding these items, net earnings per share were $2.76.



TO OUR STOCKHOLDERS



George J. Sella, Jr., Cyanamid Chairman, President and Chief Executive Officer

In 1988 your company set sales and earnings records for the second consecutive year and continued to build momentum for the future.

Our innovative research and development effort made significant strides in developing major new products in each of our business groups, and several new products were introduced in markets throughout the world. In particular, we benefited from the continued growth of both our agricultural business through new product development in the herbicide area and of our medical business through improved marketing effectiveness in human antibiotics.

We initiated collaborative research and commercial ventures to strengthen our businesses, and we continued to shift our business emphasis from commodity to specialty products. Each of these strategic components of our global business plan is vital to fulfilling our objective of sustained earnings growth.

Net earnings in 1988 were a record $305.6 million, or $3.41 per share, 11% higher than $275.6 million, or $3.02 per share, in 1987. Net earnings per share in 1987 included approximately $.13 per share from the sale of the Jacqueline Cochran fine fragrance and skin care businesses and $.13 per share associated with the 1985 divestment of the Formica brand products business. Excluding these items from last year, 1988 net earnings per share were about 24% higher than in 1987.

Earnings from continuing operations in 1988 were also $305.6 million, or $3.41 per share, up 16% from $264.0 million, or $2.89 per share in the previous year. Earnings from continuing operations in 1987 included, as noted earlier, the gain from the sale of the Jacqueline Cochran businesses.

We also established record operating earnings in 1988 of $550.0 million, up 18% from $466.8 million in 1987.

Global sales in 1988 reached a record $4.59 billion, up 10% from $4.17 billion in 1987.

The Medical Group achieved record sales and operating earnings in 1988 led by strong performances of ethical pharmaceuticals, surgical sutures and medical devices. Following approval by the U.S. Food and Drug Administration (FDA), three new pharmaceutical products were introduced in the United States. In March 1988, *Novantrone* mitoxantrone, our new anticancer agent, was launched for the treatment of acute nonlymphocytic leukemia. The new *Maxzide*-25 MG triamterene/hydrochlorothiazide tablet was marketed in the second quarter of 1988 for patients whose hypertension can be managed on one daily low-dose form of the product. In January 1989 we introduced *Rheumatrex* methotrexate for the treatment of severe rheumatoid arthritis.

The Agricultural Group also achieved record sales and operating earnings in 1988. For the second consecutive year, *Scepter* herbicide, one of the imidazolinone family of herbicides, led the Group in sales and increased its market share in the world's leading soybean-producing nations, the United States, Brazil and Argentina.

Registration and market introduction of *Pursuit* herbicide, the newest imidazolinone, are expected in the United States and Brazil in 1989. *Pursuit*, which is used for weed control in soybeans, is expected to be a major soybean herbicide. The imidazolinones, used alone and in combination with other herbicides, provide the Group with a strong foundation for future growth.

In concert with our strategy to shift our business emphasis and achieve growth through research and technology, we continued our withdrawal from the fertilizer business in 1988 by closing the ammonium nitrate manufacturing facility at Hannibal, Missouri. We also sold substantially all of our farm service centers in Canada in January 1989.

Worldwide sales of the Chemicals Group were up slightly in 1988, but operating earnings suffered a decline primarily due to considerably higher environmental charges and strong competitive pressures in our specialty products businesses that made it difficult to offset raw materials cost increases with higher prices. Other factors adversely affecting operating earnings included increased investment in development efforts associated with new technology and identified growth products, and delays in government-funded aerospace projects.



William A. Liffers, Vice Chairman

As part of our ongoing strategy to redirect the chemicals business into specialty products, we completed our withdrawal from the dyes business, formed a joint venture based on our existing catalyst business, and acquired a manufacturer of adhesives for high-technology markets.

The Shulton Group achieved record sales in 1988 while operating earnings declined. However, operating earnings in 1987 included a gain of approximately $12.0 million from the sale of the Jacqueline Cochran fine fragrance and skin care businesses. Excluding this gain, Shulton operating earnings in 1988 increased 14% over the prior year. Building for the future, the Shulton Group successfully launched six major new men's fragrances and toiletry products as well as line extensions of major brands in the United States and international markets.

Worldwide Sales



Operating Earnings



Cyanamid's Executive Committee is comprised of George Sella (pictured on page 4), William Liffers (pictured on page 5), Frank AtLee and Albert Costello (pictured on page 6).



David R. Bethune, President
Lederle Laboratories Division (left)

John W. Jackson, President
Medical Device Division (right)

"To further accelerate our contribution doing things differently, taking risks ar zones," says David R. Bethune, preside graduate of Lenoir-Rhyne College, he Mr. Bethune has spent almost his entir worked with the Federal Reserve bank

While he actively pursues instilling in organization, his emphasis is on makin want Lederle to be a premier marketin that, we must find innovative and uniq products. The objective is to build stro created market niche."

The campaign to launch *Rheumatrex* m U.S. Food and Drug Administration lat arthritis, *Rheumatrex* was introduced in tive marketing strategy designed to rea broad-based communications effort.

Rheumatrex, a tablet formulation of the unique Dose Pack and has demonstrate active rheumatoid arthritis.

"***Rheumatrex*** often works to relieve the six weeks rather than the 12 to 24 week drugs," Mr. Bethune says. "Because it is to ensuring that it is taken safely and p we will convince physicians of the bene appropriate patient."

In the promotional campaign, Lederle Dose Pack it developed to help ensure in the correct dosage, thereby reducing improving overall efficacy.

Lederle also has launched a national medical information program for health care professionals to communicate the effective and safe use of the *Rheumatrex* Dose Pack. Announced via teleconferences to nearly every physician specializing in treating rheumatoid arthritis, it features a multicenter compliance evaluation program through which physicians will report patient progress as well as a special "800" telephone line for physicians and pharmacists to gain additional information.

Lederle also formed unique relationships with the Arthritis Foundation and the American College of Rheumatology to develop the marketing plan for *Rheumatrex*. The support of these prestigious organizations is at the core of Lederle's decision to target its promotional campaign directly to consumers. Consumer-education advertisements stressing the importance of patients seeking expert treatment advice from rheumatologists will appear on television and in national consumer publications.

The marketing strategy to introduce *Rheumatrex* in a nontraditional manner sets a Lederle standard for innovation in the launching of future products and for new marketing approaches for established products.

While Mr. Bethune concentrates on creating and supporting an innovative environment in a well-established business, John W. Jackson, president of the Medical Device Division, is looking for innovative approaches to build a major new medical business for Cyanamid. A graduate of Yale and the European Institute of Business Administration, INSEAD, Mr. Jackson began his Cyanamid career in international medical products before assuming worldwide responsibility for medical devices in early 1986.

"The goal of the division was to use our established Davis & Geck wound closure business as a foundation, and through research and development and selective acquisitions, to build a strong unit composed of ophthalmic, orthopaedic, wound management and cardiac devices," Mr. Jackson says.



This color-enhanced x-ray of the hands of a person suffering from severe rheumatoid arthritis shows the crippling effects of the disease. Lederle's *Rheumatrex* offers new hope to patients.

He is enthusiastic about the success already achieved in eye care. "In three short years, we've built a solid eye-care business and positioned Cyanamid as a major player in this fast-growing field," Mr. Jackson says. The effort began in 1986 with the acquisition of Storz Instrument Company, a U.S. leader in the development of ophthalmic instruments. In 1987 the high-quality Coburn intraocular lens business was acquired and consolidated with Storz.

According to Mr. Jackson, "The synergy between the intraocular lens business and Storz has helped both product lines grow much faster, and now we've added a new impetus for growth with the Medical Device Division taking over responsibility for Lederle ophthalmic pharmaceutical products.

"Ophthalmic pharmaceuticals are an excellent example of what can happen when you change your perspective in building a business," Mr. Jackson says. "By moving them from Lederle to Storz, we not only complemented Storz' established line of ophthalmic surgical devices, but also have taken advantage of the Storz' sales force dedicated strength in selling to eye-care professionals." According to Mr. Jackson, "Another benefit is that we are generating more new ideas in research and development which will help build a significant ophthalmic pharmaceutical business for Cyanamid." They include anti-infective agents and new drugs to treat glaucoma and dry eyes.

Mr. Jackson is taking a similar innovative approach to building an orthopaedic business. "The acquisition of Acufex Microsurgical, Inc. in 1986 gave us entry into this area through an organization of people who pioneered the development of products for arthroscopic surgery," Mr. Jackson says. "If you add to the strength of Acufex our position with Davis & Geck as the developer of *Dexon*, the world's first synthetic absorbable surgical suture, and our research strengths in polymer chemistry, you see exciting opportunities for new product ideas that could change orthopaedic surgery."

One such effort already under way is the development of unique absorbable polymer products for orthopaedic surgery.

"Change was the impetus for the creation of the Medical Device Division, so innovation is a way of life for us and largely responsible for our success," Mr. Jackson says. "It is not



Cyanamid has built a strong position in the eye-care market with Storz Instrument Company, Coburn intraocular lenses and Lederle's ophthalmic pharmaceuticals.

something we just talk about, we do it–from our research and development, to manufacturing, to marketing, to our sales people. We're all participants in an exciting new adventure."

A project called "Counter Attack" launched the Agricultural Division into the innovation process in 1983, recalls President Darryl D. Fry.

Introduced in 1975, *Counter* insecticide had become the division's sales leader and U.S. corn market leader, but it was a maturing product and had just lost its number-one position in market share. Mr. Fry decided a new approach was needed to revitalize an excellent product.

A "Counter Attack" team was handpicked, composed of people from all sectors of the business. Mr. Fry instructed the team "to head up to the mountains and not come back until they had a brand new marketing plan. I want it to be aggressive."

In five days a proposal was ready. It was innovative. It was risky, but Mr. Fry liked it.

Within a matter of weeks, *Counter* was relaunched and repositioned to become the first soil insecticide to take advantage of the trend toward "conservation tillage"–leaving the corn stubble in the field during the winter and using minimum or no tillage during spring planting, a practice which prevents soil erosion and saves the farmer time and money. *Counter* could be applied either directly in the furrow when the seed was planted or after planting, a major competitive advantage.

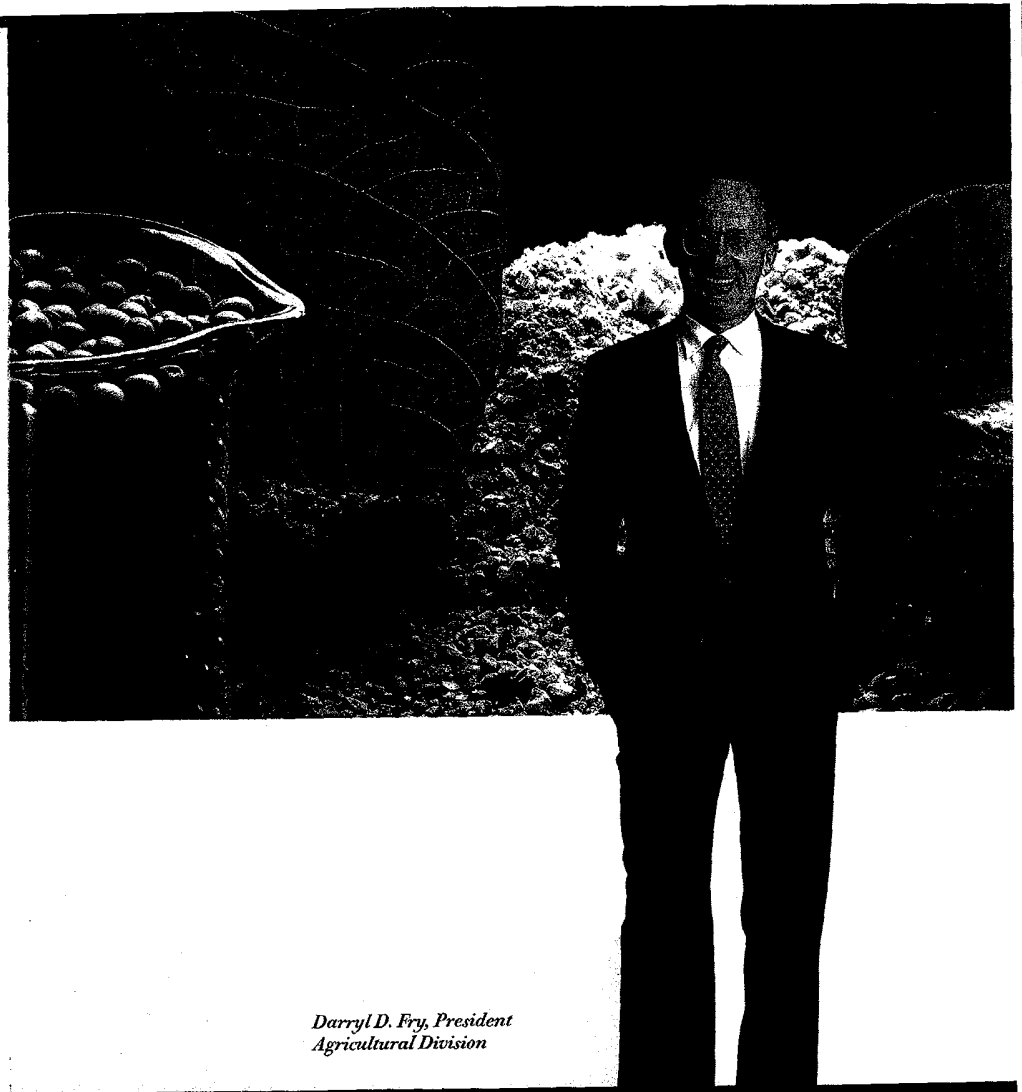
The results were quick and dramatic, and with additional innovative programs, *Counter* has continued to gain market share, rising from 22% to a current leadership position of 36%.

"Our success with *Counter* proved to the entire organization that we were serious about doing things differently," Mr. Fry reports. "Our operating style began to emphasize innovative thinking, aggressiveness and pride of ownership. To build on the *Counter* momentum, we increased the number of interdisciplinary teams in the division. They differed from previous teams in that they were not just to recommend, but to implement. Ninety percent of innovation is the desire and ability to implement," Mr. Fry says.

"Teams come and go, but more permanent business units also were established to give focus to industrial herbicides, and turf, lawn and garden products," Mr. Fry says.



Counter soil insecticide is the ideal insecticide for "conservation tillage"–corn stubble left in the field during the winter, requiring minimum or no tillage in the spring.



Darryl D. Fry, President
Agricultural Division

Led by the new imidazolinones–*Scepter*, *Arsenal* and *Assert* herbicides–and a new culture, the Agricultural Division has launched 17 significant products in four years. During the same period, sales of *Prowl* herbicide and its active ingredient, pendimethalin, have increased significantly.

Mr. Fry, an engineering graduate of the Memorial University of Newfoundland and the Nova Scotia Technical College, served in production, planning and marketing management in Cyanamid's chemicals business prior to joining the Agricultural Division. He believes that the momentum that began with the repositioning of *Counter* led to the creation in 1987 of an innovative new distribution system called Cyanamid AgriCenters.

After decades of working through the traditional distributor network, changes were needed to ensure future prosperity. In an industry known for conservatism, Cyanamid took a bold risk by creating its own distribution network comprised of about 1,800 key dealers who serve as direct Cyanamid customers.

Cyanamid chose the largest and most efficient farm dealers and many of the existing distributors to become AgriCenters. They buy Cyanamid products directly from the company and sell them directly to farmers. The system eliminates one level in the distribution chain while greatly enhancing the sales and technical support to the AgriCenters and the farmers. The program also includes a network of distribution agents who service the AgriCenters with warehousing, pickup and delivery, and by generating orders and providing other essential services.

"Our goal is to provide leadership in agri-marketing by developing programs that will position us for the future," explains Mr. Fry. "This new system is helping us get closer to the end-user, the farmer, while strengthening Cyanamid's position in the market and helping dealers and distributors earn profits with less risk."



In addition to the imidazolinone herbicides, another major product is *Prowl* herbicide for grass and broadleaf weed control in a wide range of important crops.

After two years, the AgriCenters have been a major success. More dealers are clamoring to join the program, competitors are using the concept to modify their own programs and farmers are impressed with the improved level of service.

"We believe this is the most significant nontechnical move made in the industry in recent years," says Mr. Fry.

"Efficient distribution, aggressive marketing programs and hands-on technical support from sales and marketing will be the key to the success of major Cyanamid products now in various stages of development," Mr. Fry says.

"There's no question that the agricultural industry is becoming more service intensive as we develop more sophisticated, high-tech products," Mr. Fry says, "and our objective is to be the industry leader in developing better ways, such as the AgriCenters, to service our customers."

A growing emphasis on the customer also is the impetus for Cyanamid's Chemicals Group as it increasingly changes from a commodity-based business to one based on specialty chemicals and high-technology products.

According to Venture Chemicals Division President William J. Murray, "The creation of our division in 1986 demonstrated the company's commitment to breaking away from the traditional chemical product development and commercialization process and moving it closer to changing markets and customer needs."

A graduate of Manhattan College and New York University, Mr. Murray knows the chemicals business from the ground up, having joined the company as a production trainee and progressing through sales and marketing management in the company's U.S. and international businesses.

"We are the incubator for new businesses in the Chemicals Group; we create and nurture them, and in the process, determine their ultimate commercial potential," Mr. Murray says. "If we believe that a business has a viable life of its own, we then put it up for adoption within the Group."



Cyanamid's innovative AgriCenters have increased hands-on technical service and support to farmers, strengthened the company's position in the marketplace and helped dealers and distributors to earn profits with less risk.

A good example of the process is Cyanamid's new urethane chemicals, the aliphatic isocyanates, which are used in products ranging from paints to flooring materials. Venture Chemicals worked closely with both research and manufacturing to move these new specialty chemicals from the laboratory to the marketplace. Now they are a part of the Polymer Products Division's growing coating resins business.

"The engineered materials area also is our responsibility," Mr. Murray says, "and here our emphasis is on next-generation products for the aerospace industry, including a new series of composites and new adhesives for military and commercial aircraft."

In the metal-coated fibers area, the Venture Chemicals Division is marketing a unique nickel-coated fiber to shield out interfering signals in electronic products. Other new business development areas include electronic chemicals, lasers used in military, medical and commercial applications, and industrial bioseparations.

"All are examples of Cyanamid's strategy of participating in the high-tech chemical markets of the future," Mr. Murray notes. "By necessity, our business profile will change frequently because if we do our job right, we'll be able to give the other divisions strong businesses that will be significant contributors to their operating earnings. And that will benefit the entire company."

While the Venture Chemicals Division is the Group's model for new product development, the Industrial Products Division is setting a new standard for innovative marketing of chemical specialties.

"Due to the rapid changes in the markets for organic flocculants–our core business–and the development by our scientists of an exceptional new product line, we recognized an opportunity to build new business for the division," notes Charles A. Ruibal, president of the Industrial Products Division. A graduate of Villanova University, Mr. Ruibal's Cyanamid career includes a variety of marketing and sales management positions in both specialty and agricultural chemicals as well as process engineering experience at the plant level.

"The key was to make a major change in our marketing approach. Our scientists were completing work on a new generation of organic flocculants. Our goal was to accelerate development of the products for three different markets–paper manufacturing, water and



Cyanamid engineered materials and adhesives are used in the F-16 fighter and other military and commercial aircraft. The Venture Chemicals Division is now working on next-generation products for the aerospace industry.

waste treatment, and mining–and to launch them simultaneously under one marketing banner–the *Performance Series.* Because timing was critical, we mobilized divisionwide resources in R&D, manufacturing, technical service and sales," Mr. Ruibal recalls. "We had everyone working concurrently–rather than the traditional sequential commercialization process–to meet the targeted launch date.

"Another departure was large-scale, market-specific applications testing of the products by our technical specialists. This demonstrated to key customers that we knew their needs, and equally important, it gave us the data to confirm that the *Performance Series* met those needs," Mr. Ruibal says.

The entire effort culminated in the *Performance Series* Trade Show, which the division staged both to announce the new product line internally to the sales forces who serve the three markets and to conduct a major trade media launch to gain maximum publicity.

"We were convinced that our success with the new product line depended on our ability to prepare the sales force to introduce the new technology and to gain maximum attention for them in the industry.

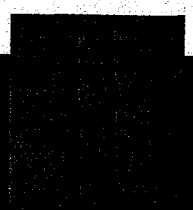
"It worked," he adds. "The impact of the multimarket launch accelerated market acceptance of the line. The results are excellent. We had record sales growth in 1988 and have gained market share–and now we're working on the next generation of technology in this area," Mr. Ruibal says.

The key to accelerated sales growth in the Polymer Products Division is customer involvement in the development of quality products, according to President Gerald M. Saluti. A graduate of Providence College and Boston College, Dr. Saluti joined Cyanamid as a research chemist and progressed through various technical, marketing and operations management positions in the chemicals business.

"Constant improvement in quality, performance and cost are the keys to our future success," says Dr. Saluti, "and we're now involving our suppliers and customers in our product development programs. In essence, we're partners in making the highest quality, highest performance products, which is an innovative approach for the chemical industry.



A new generation of Cyanamid-discovered flocculants, the *Performance Series,* is used in liquid/solid separation in wastewater treatment, providing competitive advantages as a result of improved quality and performance.



Tough, abrasion-resistant specialty coatings protect bridges, automobiles and a host of consumer and industrial products. Cyanamid's new aliphatic isocyanates are used in high-performance coatings.

"For example, as the market leader in intermediates and crosslinking agents for the coatings industry, we were in a unique position to discover and develop new high performance urethane products for this market–innovative products to serve our customers' needs," Dr. Saluti says. "We believe our unique new class of urethane chemicals–the aliphatic isocyanates–which we commercialized in 1988, will further demonstrate our leading market position."

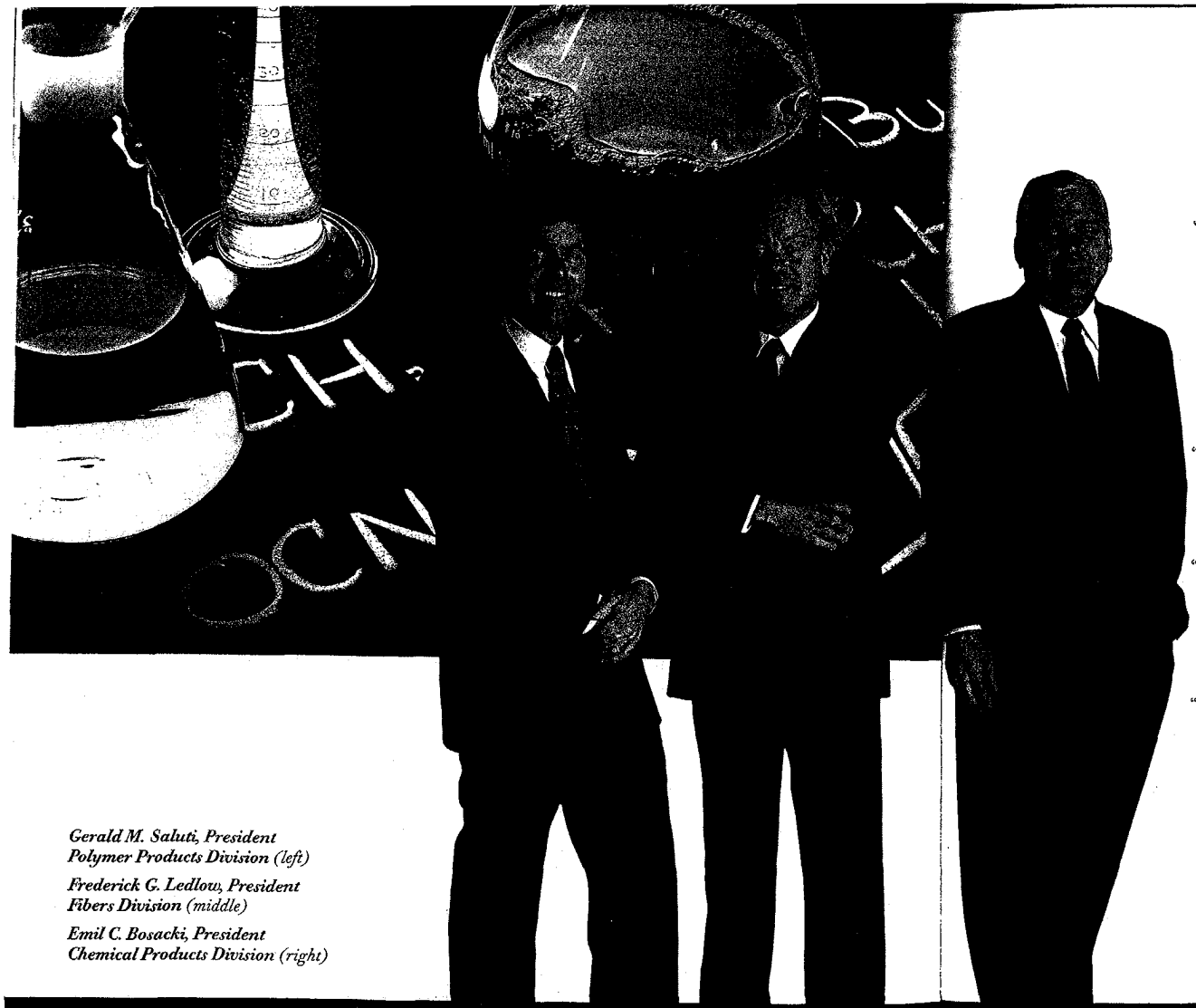
Because the aliphatic isocyanates provide better light stability and physical characteristics in high performance coatings, their potential markets range from the automotive, industrial and aircraft industries to manufacturers of roofing and flooring products. Another major advantage of the aliphatic isocyanates is that they provide a greater margin of safety to workers handling them than currently available isocyanates.

Early in 1988 the product introduction process began. "Our marketing plan was designed to give the isocyanates the broadest market exposure and to generate a strong commercial response," Dr. Saluti says. "First, we conducted a national editorial tour to announce the line to the key trade publications. That was followed by a six-month advertising campaign which coincided with the press coverage of the products. At the same time, we produced a videotape for major potential customers which described the superiority of the isocyanates and our new plant for their manufacture. Since we're responsible for this business globally, we also launched an advertising campaign in Europe this past fall."

The commercial response to the market introduction of the isocyanates exceeded expectations. "In the first six months of 1988," Dr. Saluti reports, "we received more than 600 requests from customers for samples of the products. We are continuing to develop applications and uses with our current customers and to capitalize on the broad introduction of the isocyanates to many new customers and markets."



Cyanamid's new fibrillated fiber acts as a binding agent in high-absorption filtration devices containing activated carbon and provides a higher level of toxin removal.



Gerald M. Saluti, President
Polymer Products Division (left)

Frederick G. Ledlow, President
Fibers Division (middle)

Emil C. Bosacki, President
Chemical Products Division (right)

Developing new specialized business opportunities based on changing market needs also is the goal of the Fibers Division, according to President Frederick G. Ledlow. A graduate of the University of Toronto, Mr. Ledlow also served in the management of Cyanamid's Formica brand products business and was president of Cyanamid Canada, Inc.

"**O**ur new fibrillated fiber is an important step in our plan to shift emphasis from mature textile segments to new specialized, high-growth business areas. This new product will allow us to avoid the cyclical downturns inherent in the textile business," Mr. Ledlow says. "We're working closely with industries which are technology leaders to develop innovative uses for this new product."

The term "fibrillate" means to break down a fiber into much smaller fibers, a process used in the paper industry to make paper pulp, but a radical departure from textile industry processing.

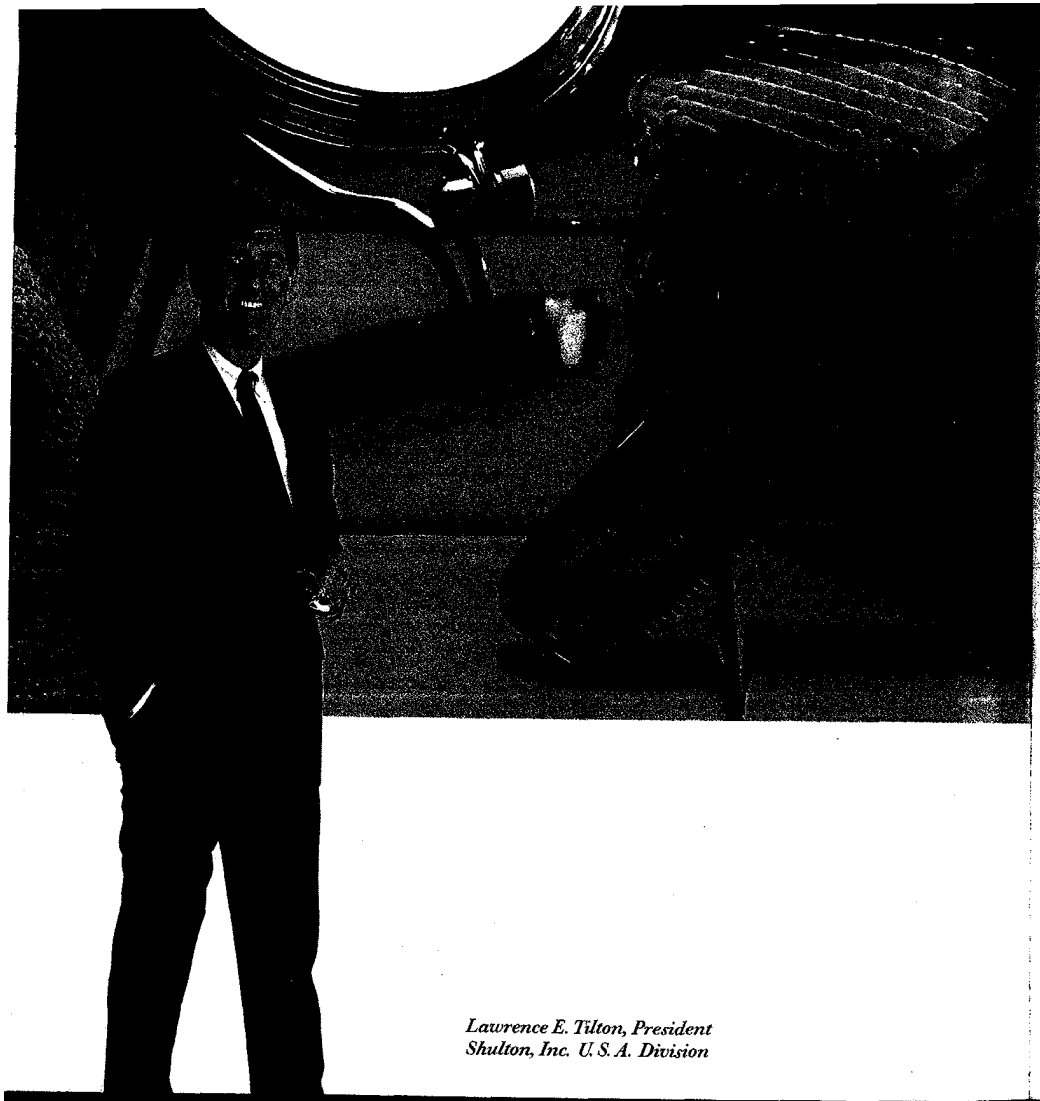
"**C**yanamid's Chemical Research Division developed the fibrillation process to give *Creslan* acrylic fiber exceptional strength and the ability to act as a binder in high-absorption filtration devices and molded products, such as respirators used when spraying agricultural chemicals and in brake linings for the automotive industry," Mr. Ledlow explains.

"**F**or example, the fibrillated fiber acts as a binding agent for filters containing activated carbon. The carbon absorbs selected toxins from air or water passing through the filter. The use of fibrillated fiber as the binder allows the filter to contain as much as 25% more carbon than traditional adhesive binders. The additional carbon provides a significantly higher level of toxin removal, a major breakthrough," Mr. Ledlow says.

"**O**ur fibrillated fiber is environmentally safe and an innovative approach to the growing safety, health and environmental concerns which are creating a demand for products that filter harmful substances from air and water," Mr. Ledlow says. "We're positioning our product to respond to those concerns."

The shift toward specialty products and services which provide innovative solutions to customer problems also is the goal of the Chemical Products Division, according to President Emil C. Bosacki. A graduate of McGill University and the University of

Calcium carbide is used in steel making to remove sulfur, but it creates a slag disposal problem. Cyanamid's new desulfurizing agent solves the disposal problem.



Lawrence E. Tilton, President
Shulton, Inc. U.S.A. Division

Western Ontario, Mr. Bosacki's Cyanamid career includes engineering and management experience in the company's Canadian and U.S. chemicals business as well as serving as president of Cyanamid's former Plant Food Division.

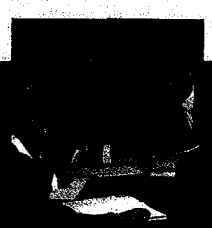
He believes that products which help solve environmental problems offer real opportunities for innovation. "The foundry industry provides a good example," Mr. Bosacki says. "Sulfur removal is an important part of steel making, and calcium carbide is employed to accomplish this. However, unreacted carbide–which remains in the foundry slag when desulfurization is complete–poses a major environmental problem in slag disposal for the industry," Mr. Bosacki says. "We have developed a new desulfurizing agent which eliminates the unreacted carbide and solves the problem. Foundries across North America are rapidly moving to use our new product."

Similarly, the Chemical Products Division is developing new technologies and new products which allow the elimination of chemicals of environmental concern from bonding resins.

Another key effort in the Chemical Products Division is its Customer Care Program. "This program is an example of the changing emphasis in the chemical industry from one which was heavily product oriented to one designed to serving the customers' needs. This approach uses teams of people from various functions–manufacturing, technical service, marketing–to concentrate on satisfying our customers' needs," Mr. Bosacki says. "We care how our customers perceive us as a company, and we are working diligently to serve them."

Moving a business closer to the trade customer and the ultimate consumer, and improving and accelerating decision-making were the goals of the team management structure adopted by Shulton, Inc. U.S.A. in 1988, according to President Lawrence E. Tilton.

"For some time, we have been finding innovative ways to do the big and small things better in all phases of our business–from research and development to marketing and customer service," Mr. Tilton says. "These innovative initiatives almost always come from the people who are closest to the business and to the customer. They have a real impact on our ultimate business performance. The results of these efforts convinced us that we were on the right track. Operating results have more than doubled since 1985, and sales have increased more than 10%. That's good, but we can do better; and that's why we adopted the team approach in 1988."



The goal of Shulton U.S.A.'s team management structure is to increase operating results by focusing each business unit on both the trade and the consumer to speed new product development.

Shulton U.S.A. was restructured into three new business teams with general managers appointed to run them. They are toiletries and fragrances, household products, and Lederle consumer health products. Marketing responsibility for consumer health products was assigned to Shulton U.S.A. to gain marketing synergies among Cyanamid's three consumer businesses, although assets, sales and operating earnings will continue to be included in the Medical Group. The result is three independent units in which each general manager is given responsibility for the business.

"The team concept is a departure from our traditional way of running the consumer products business," Mr. Tilton explains. "Each team is comprised of representatives from marketing, sales, manufacturing, distribution, finance, information services–all of the functional areas of the business that must mesh for us to improve the focus of our individual businesses on both the trade and the consumer and to speed the response time in delivering new products," Mr. Tilton reports.

A graduate of Southwest Texas State University, Mr. Tilton progressed through sales and training management in the Lederle Laboratories Division before becoming general manager of Lederle proprietary products where he was responsible for developing the over-the-counter medical products business. He joined Shulton U.S.A. as vice president in 1986.

In addition to restructuring his division to promote innovative management practices, Mr. Tilton also sees the establishment of T3 as a vehicle to generate growth through innovation. "T3–Technology Transfer Team–has as its mission to quickly identify and evaluate new technologies that have potential as new products. These technologies come from other Cyanamid divisions as well as from outside the company. If a project has potential, it is then moved into development," he explains.

"I believe the team approach helps instill pride of ownership in the individuals, and ownership begets innovation. This is a crucial change to help us focus on our businesses and grow them faster than we have in the past," Mr. Tilton says.

At Cyanamid, innovation is a state of mind and a state of action. It is fueled by a most fundamental phenomenon–the process of change–of changing our own mindsets so that we free ourselves to use our creativity to solve problems, to explore new avenues, to satisfy market needs and to take risks in the realization of opportunities for the profitable growth of our businesses.



In 1988 Shulton assumed marketing responsibilities for Lederle consumer health products. The reformulation of *Centrum* multivitamins to include beta-carotene helped boost sales and market share.

BUSINESS PERFORMANCE

Medical Group 26
Agricultural Group 28
Chemicals Group 30
Shulton Group 31

MEDICAL GROUP

In 1988, for the third consecutive year, the Medical Group set sales and operating earnings records.

Worldwide operating earnings increased 31% to $283.9 million compared to $216.4 million in 1987. Sales reached $1.83 billion, a 12% gain over the $1.64 billion in 1987. The major areas of the business improved, with our international operations performing exceptionally well.

Minocin minocycline, the established tetracycline antibiotic, was again the sales leader for the Medical Group. It continued to register sales gains as a result of its repositioning as a major therapy for the treatment of acne, sexually-transmitted diseases and respiratory infections.

In May we received U.S. Food and Drug Administration (FDA) approval for the new 25 MG tablet of *Maxzide* triamterene/hydrochlorothiazide. The product was successfully introduced to physicians for the treatment of patients whose hypertension can be managed on a daily low-dose form of the product and complements Lederle's 50 MG tablet.

Sales of *Novantrone* mitoxantrone, an anticancer agent, more than doubled as a result of its U.S. launch in March for the treatment of acute nonlymphocytic leukemia and its continued growth in international markets. *Novantrone* is sold in more than 35 foreign countries for use in the treatment of advanced breast cancer, leukemias, non-Hodgkin's lymphoma and primary liver cancer. We are working to extend *Novantrone* to new indications and markets.

Sales of Methotrexate, the anticancer agent, grew in 1988. The FDA approved orphan drug status for high-dose Methotrexate to treat osteosarcoma and for calcium leucovorin as a rescue agent to reverse the toxic effects of Methotrexate in the treatment of osteosarcoma. International sales of calcium leucovorin registered impressive gains.

The FDA also granted approval for the use of *Rheumatrex* methotrexate for the treatment of severe rheumatoid arthritis. *Rheumatrex* was launched in the United States in January 1989.

In international markets, *Pipracil* piperacillin, our semisynthetic penicillin, registered strong sales gains. Sales of bisoprolol, sold under the *Monocor* and various other trademarks, grew in its first full year on the market. A cardioselective beta blocker for use in the treatment of hypertension and angina, *Monocor* is in Phase III clinical trials in the United States. Felbinac, a topical application of fenbufen, our antiarthritis drug, was introduced overseas for arthritis pain and soft tissue injuries.

We also registered bisantrene, an anticancer agent, in France. It is expected to be launched in France during 1989 for use in the treatment of leukemia.

In the United States, sales of Lederle biologicals increased. In the consumer health products area, the 1988 reformulation of *Centrum* multivitamins to include beta-carotene helped boost sales significantly and improved market share. The U.S. market share of *FiberCon* calcium polycarbophil bulk forming laxative also increased.

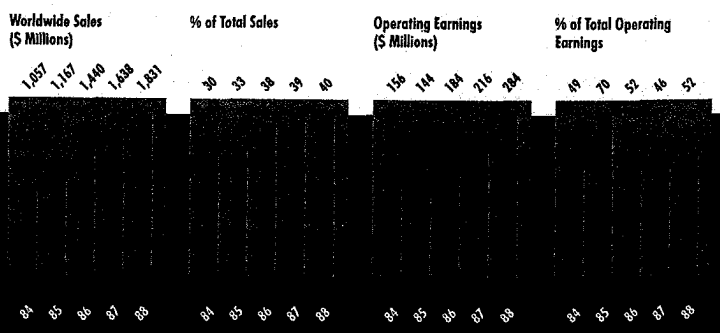
Our medical device business produced healthy gains in all three areas–Davis & Geck, our wound closure business; Storz Instrument Company, the eye-care business; and Acufex Microsurgical, Inc., the orthopaedic operation.

Sales of Davis & Geck's *Dexon* synthetic absorbable sutures were especially strong in international markets. Sales of *Maxon* monofilament absorbable suture rose as the product continued to gain surgeons' acceptance in the United States and in international markets because of its versatile use in nearly every surgical specialty. Storz continued to build an integrated ophthalmic products business and made significant strides in developing international markets.

Medical product research, with a special emphasis on the sciences of biotechnology, continued to make progress with several anticancer agents, cardiovasculars, antibiotics, vaccines and medical devices in various stages of development.

In the antibiotics area, we are awaiting FDA approval of *Suprax* cefixime, a third-generation oral cephalosporin. It has shown efficacy in the treatment of respiratory system and urinary tract infections and various childhood diseases.

We also are working to combine tazobactam, a beta-lactamase inhibitor licensed from Taiho Pharmaceutical Company of Japan, with piperacillin to broaden that product's use against gram-positive and gram-negative pathogens and to enhance bacterial susceptibility.



"Sales of Novantrone mitoxantrone... more than doubled as a result of its U.S. launch... and its continued growth in international markets."

Six anticancer agents, including three biotechnology products utilizing monoclonal antibodies, are in various stages of development. One biotech agent for the treatment of lymphomas entered clinical trials in the fall. In addition, Photofrin II, a light-sensitive chemotherapeutic agent used to target and destroy cancer cells, is in Phase III clinical trials. Cyanamid acquired the marketing rights to Photofrin II in 1987.

In the cardiovascular area, a hypolipidemic licensed from Rice University is in clinical trials. It is used to lower cholesterol and to treat or prevent arterial plaque buildup. Nilvadipine, a calcium channel blocker for treating hypertension and angina, also is in clinical trials.

Several viral and bacterial vaccines are in various stages of development. Viral products include new vaccines for polio and herpes simplex 1 and 2. In the bacterial area we are making progress on an acellular pertussis vaccine, an Haemophilus influenzae vaccine for infants under two years old, and vaccines for meningitis, pneumonia in infants and sexually-transmitted diseases.

The Medical Device Research Division is developing new generations of surgical sutures, instruments for both diagnosis and surgery, and new ophthalmic pharmaceuticals.

AGRICULTURAL GROUP

An outstanding performance by *Scepter* herbicide led the Agricultural Group to 1988 records for worldwide sales and operating earnings.

Worldwide operating earnings climbed 34% to $166.7 million compared to $124.7 million in 1987. Sales reached $1.07 billion, a 16% increase over $919 million in 1987 and the first billion dollar sales year for the Agricultural Group.

The drought which affected the midwestern portion of the United States in the summer of 1988 had little impact on sales of Cyanamid herbicides and insecticides because of their application early in the season.

Scepter, a member of the imidazolinone family of herbicides, was the sales leader for the second consecutive year as it continued to gain in both sales and market share in the world's major soybean-producing nations–the United States, Brazil and Argentina. The introduction of *Squadron* and *Tri-Scept* herbicides, combination products which target specific problems in soybeans, helped boost the use of *Scepter* in the United States. *Squadron* herbicide is a combination of *Scepter* and *Prowl* herbicides. *Tri-Scept* herbicide combines *Scepter* herbicide with trifluralin.

The other imidazolinones also achieved sales growth. Sales of *Arsenal* herbicide rose as the product continued to increase market penetration in industrial applications and along railroad rights-of-way and made new inroads in forestry applications. *Assert* herbicide, used to control wild oats and blackgrass in wheat and barley, registered sales gains in Europe and was launched in the United States and Canada. In addition, several combination products with *Assert* are being sold in Europe.

Pursuit herbicide, for weed control in soybeans and other leguminous crops, is expected to be launched in the United States and Brazil for the 1989 planting season.

Worldwide sales of *Prowl* herbicide were a record in 1988, with strong performances in both domestic and international markets. *Prowl* continued to be a major component of numerous combination products which contributed to the product's sales growth in 1988.

Counter insecticide continued to increase its share of the U.S. soil insecticide market for corn. Sales of Malathion increased primarily due to its use in combating a boll weevil infestation in the United States and severe locust outbreaks in North Africa.

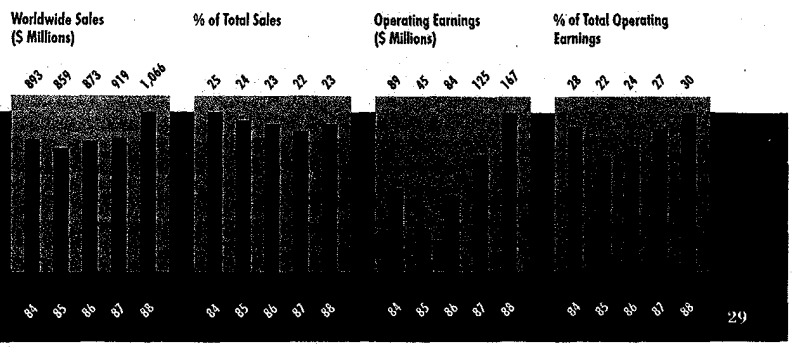
U.S. sales of *Aureomycin* chlortetracycline feed supplements were a leading contributor to higher sales of animal nutrition and health products. In international markets, *Avotan* growth promoter for broiler chickens and pigs experienced healthy sales gains.

Since its introduction in 1985, *Cygro* coccidiostat, which prevents coccidiosis in poultry, has made impressive sales gains in Latin America, Europe and the Far East. In 1988 *Cygro* was launched in Venezuela, and we expect to introduce it in 1989 in the United States and in all remaining European Economic Community countries.

In 1988 the Agricultural Group continued to reap the benefits of an innovative distribution network it introduced in the United States in 1987. More than 1,800 dealers and distributors serve as direct Cyanamid customers through a system of AgriCenters. The program is proving successful in helping Cyanamid get closer to its major customer, the farmer.

Our research and development team continued to make strides in developing several major new products.

Crop protection chemicals in development include a corn herbicide, a cereal herbicide for use in Europe and a plant growth regulant



"Scepter. . . was the sales leader for the second consecutive year as it continued to gain in both sales and market share in the world's major soybean-producing nations. . ."

for fruits and nuts. We have a new family of insecticides with a unique mode of action that we hope to extend into full development in 1989.

Biotechnology projects include work with Pioneer Hi-Bred International to develop hybrid corn incorporating a gene making it resistant to our imidazolinones. In cooperation with other research-based organizations, we are making progress in developing imidazolinone-resistant wheat, vegetables, rapeseed, rice and sugar beets. We also are developing a higher-yielding hybrid cotton plant.

Work in the animal area centers around our bovine and porcine somatotropins. BST, the bovine product, safely increases milk production and efficiency in dairy cows. Field trials on BST involving more than 100 individual dairy farms are under way. PST, for swine, improves feed efficiency, increases lean meat and reduces fat. These products demonstrate unquestioned effectiveness, but registration may be prolonged due to political and social controversy surrounding these products. Biotechnology also is being used to develop growth-promoting agents and products to stimulate the immune system of animals.

Oxidectin, an endo-ecto parasiticide, is being developed for use against a broad spectrum of internal and external parasites on cattle, sheep, hogs, horses and dogs.

CHEMICALS GROUP

Worldwide sales of the Chemicals Group improved slightly in 1988 to $1.10 billion, a 6% gain from the $1.04 billion in 1987. Operating earnings declined 30% to $47.4 million compared to $68.2 million in 1987. Lower results were primarily due to higher costs for environmental remediation; strong competitive pressures that made it difficult to offset increased raw materials costs with higher prices; increased investment in process startups and new technology development in identified growth products; as well as delays in government contracts.

While 1988 was a difficult year for the Chemicals Group, we anticipate improvements in 1989. Increases in expenses for environmental cleanup at our plants are slowing. In addition, cost increases in 1989 for raw materials are expected to be lower than in 1988. We also see a firming of prices in the specialty chemicals area and are confident that new products, such as the aliphatic isocyanates, will bring new business opportunities for the Chemicals Group.

In 1988 we sold the remainder of our dyes business; acquired Conap, Inc., a producer of adhesives, sealants and encapsulants, which will enhance our strong position in the automotive, aerospace and other industrial markets and help us enter new business areas; and formed the joint venture, Criterion Catalyst Company L.P., with Shell Oil Company and Shell International Chemical Company, to manufacture and sell refinery and selected chemical process catalysts.

In 1988 sales gains were achieved in international markets with strong performances in acrylamide, acrylic fibers, mining, paper and water treating chemicals, engineered materials and plastics additives.

In the United States we experienced improvements in sales of sulfuric acid, *Cyalume* chemical light products, organic flocculants, mining chemicals, engineered materials, molding compounds and plastics additives.

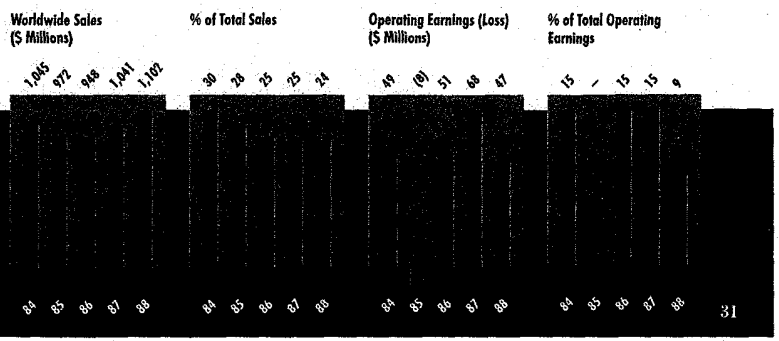
The Chemicals Group is making progress in building a future based upon specialty products businesses such as the unique class of urethane chemicals called aliphatic isocyanates introduced in 1988. They are used in paints for the architectural and automotive industries and in roofing and flooring applications.

Our chemical research program is emphasizing new technologies to develop products to help move us into the 21st century. Progress is continuing in the electronic chemicals business, developing high-tech semiconductor components and devices for use by the defense, communications and medical industries and developing a lower-cost, copper-plated carbon fiber to expand our emerging metal-coated fibers business. In 1988 we continued our research agreement with BioProbe International, which specializes in developing methods of attaching proteins to affinity substrates. This technology has potential application in bioseparations, which are used to manufacture natural pharmaceuticals.

SHULTON GROUP

1988 was a record sales year for the Shulton Group as worldwide sales reached $594 million, up 5% from the $568 million in 1987. However, operating earnings declined 10% to $52.0 million compared to $57.5 million in 1987, which included a gain of $12.0 million from the sale of the Jacqueline Cochran fine fragrance and skin care businesses. Excluding this gain, Shulton operating earnings rose 14% in 1988.

All of our major brands registered sales gains in 1988, led by results in our interna-



"Our chemical research program is emphasizing new technologies to develop products to help move us into the 21st century."

tional markets which achieved significant sales increases for the third consecutive year. Worldwide sales of *Combat* insecticide products, *Pine-Sol* liquid cleaner and *Old Spice* fragrances reached all-time records in 1988.

In addition, the U.S. market share of many of our key products rose, including the line of *Combat* insecticides, *Old Spice* men's fragrance and *Old Spice* deodorants and antiperspirants.

Combat was the only major consumer insecticide brand to achieve U.S. sales and market share gains and moved into second place in the category. *Combat Roach Control System* was launched in Mexico, Argentina, Korea and Singapore. Expansion into additional markets will occur in 1989 as Shulton continues to build *Combat* into a worldwide brand.

As the mainstay of the toiletries business, *Old Spice* registered sales gains in both the United States and international markets. Our U.S. introduction of *Old Spice Liquid Stick* antiperspirant was well received.

We also introduced five new men's fragrances: *Sante Fe, Bleu Marine de Cardin,* the newest addition to the line of *Pierre Cardin* men's fragrances and *Old Spice* Fresh Scent in the United States; *Rapport* in the United Kingdom; and *Maxim's Pour Homme* in France.

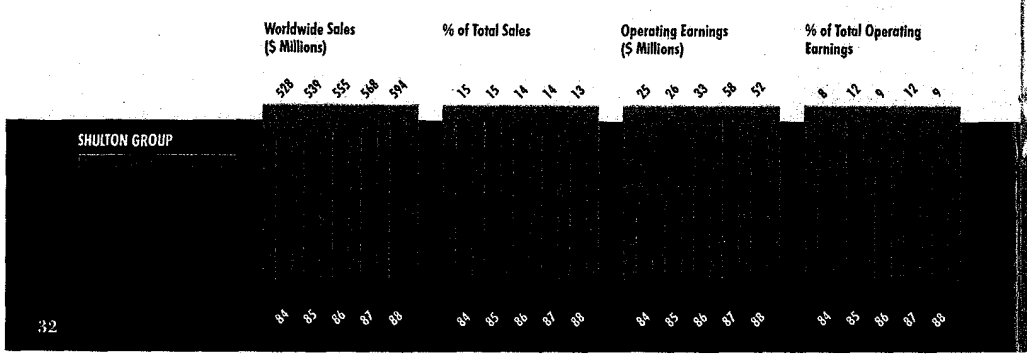
In addition, sales of *Insignia* men's fragrance increased in international markets, and *Insignia* hair care products were launched in the United Kingdom.

Sales of *Pine-Sol* liquid cleaner increased, especially in international markets. In the United States, *Pine-Sol* continued to increase its lead as the number-one brand in the household cleaner market. An important product improvement is planned for 1989.

Sales of *Breck* hair care products benefited from the U.S. introduction of *Breck* non-aerosol hair spray and a styling gel.

Shulton's strategy for future growth includes an aggressive product development program aimed at improvements and line extensions of established brands and the development of new products.

In 1989 the line of *Thrive* hair care products for men with thinning hair will be introduced in mass markets in the United States. We also plan to introduce additional line extensions under the *Combat* brand name. Several other unique household and grooming products are in various stages of development.



SHULTON GROUP

FINANCIALS

Financial Review 34
Earnings Statements 36
Balance Sheets 37
Statements of Cash Flows 38
Notes 39
Business Groups 48
Geographic Areas 49
Management Statement 50
Independent Auditors' Report 50
Five-Year Summary 51
Discussion and Analysis of Financial Condition and Results of Operations 52

Operating Results—Cyanamid's consolidated sales in 1988 were $4.59 billion, an increase of 10% from the $4.17 billion in 1987. Sales in 1987 were 9% higher than the $3.82 billion in 1986. Earnings from continuing operations in 1988 were $305.6 million or $3.41 per share, up 16% from the $264.0 million or $2.89 per share in 1987, which were 30% above the $202.5 million or $2.18 per share in 1986. Net earnings of $305.6 million in 1988 were 11% above the $275.6 million in 1987, which were 36% above the $202.5 million in 1986. Net earnings per share in 1988 were $3.41 compared to $3.02 in 1987 and $2.18 in 1986.

Common Stock and Dividends Paid—Reported comparative high and low market prices on the New York Stock Exchange Composite Tape and dividends paid per share of common stock by quarter for 1988 and 1987 were:

	1988			1987		
	Market Price		Dividends	Market Price		Dividends
Quarter	High	Low	paid	High	Low	paid
First	$56	$41⅞	$ .2625	$49¼	$39	$ .2375
Second	55⅝	44⅛	.30	54	42⅜	.2625
Third	54⅜	45¼	.30	57	48¼	.2625
Fourth	52¼	44	.30	51¾	29	.2625
			$1.1625			$1.025

As of February 16, 1989, the most recent record date, there were 52,195 record holders of the company's common stock. See Note 7 to the Consolidated Financial Statements regarding limitations on the payment of dividends.

Quarterly Results—Quarterly results for 1988 and 1987 were as follows:

(Millions of dollars except per share amounts)	1988						
						Per share of common stock	
Quarter	Net sales	Gross profit**	Earnings from continuing operations	Discontinued operations	Net earnings	Earnings from continuing operations	Net earnings
First	$1,148.5	$ 563.1	$ 79.2	$ —	$ 79.2	$ .88	$ .88
Second	1,246.3	627.6	99.5	—	99.5	1.11	1.11
Third	1,094.1	554.1	64.1	—	64.1	.71	.71
Fourth	1,103.1	557.7	62.8	—	62.8	.71	.71
Total	$4,592.0	$2,302.5	$305.6	$ —	$305.6	$3.41	$3.41
	1987						
First	$1,014.1	$ 485.4	$ 61.5	$ —	$ 61.5	$ .67	$ .67
Second	1,087.3	536.8	87.6*	—	87.6	.96	.96
Third	1,039.4	496.4	54.7	11.6	66.3	.59	.72
Fourth	1,025.3	516.2	60.2	—	60.2	.67	.67
Total	$4,166.1	$2,034.8	$264.0	$11.6	$275.6	$2.89	$3.02

*Earnings from continuing operations for the second quarter of 1987 include a gain from the sale of the company's Jacqueline Cochran fine fragrance and skin care businesses. (See Note 3 to the Consolidated Financial Statements.)

**Gross profit is derived by subtracting manufacturing cost of sales from net sales.

CONSOLIDATED STATEMENTS OF EARNINGS

American Cyanamid Company and Subsidiaries

(Millions of dollars except per share amounts)

Years ended December 31,	1988	1987	1986
Net sales	$4,592.0	$4,166.1	$3,815.9
Expenses:			
Manufacturing cost of sales	2,289.5	2,131.3	2,086.2
Selling and advertising	1,183.3	1,076.1	951.2
Research and process development	365.1	313.6	278.3
Administrative and general	275.6	263.9	228.3
	4,113.5	3,784.9	3,544.0
Earnings from operations	478.5	381.2	271.9
Interest, royalties and other income, net	78.8	78.3	89.7
	557.3	459.5	361.6
Interest expense	107.6	84.6	86.3
Earnings of consolidated companies before taxes on income—continuing operations	449.7	374.9	275.3
Taxes on income (Note 10)	168.3	131.6	87.7
Earnings of consolidated companies—continuing operations	281.4	243.3	187.6
Equity in net earnings of associated companies	24.2	20.7	14.9
Earnings from continuing operations	305.6	264.0	202.5
Discontinued operations (Note 2)—			
Gain on sale (after taxes of $2.8)	—	11.6	—
Net earnings	$ 305.6	$ 275.6	$ 202.5
Per share of common stock (Note 1):			
Earnings from continuing operations	$3.41	$2.89	$2.18
Discontinued operations	—	.13	—
Net earnings	$3.41	$3.02	$2.18

CONSOLIDATED STATEMENTS OF EARNINGS EMPLOYED IN THE BUSINESS

(Millions of dollars except per share amounts)

Years ended December 31,	1988	1987	1986
Earnings employed in the business at beginning of year	$1,682.9	$1,703.2	$1,588.9
Adjustment for stock split (Note 1)	—	(200.3)	—
Net earnings	305.6	275.6	202.5
Deduct dividends of $1.1625 per share in 1988, $1.025 per share in 1987 and $.95 per share in 1986	(104.3)	(93.4)	(88.2)
Other, net (Note 8)	(4.0)	(2.2)	—
Earnings employed in the business at end of year	$1,880.2	$1,682.9	$1,703.2

See accompanying Notes to Consolidated Financial Statements.

CONSOLIDATED BALANCE SHEETS

American Cyanamid Company and Subsidiaries

(Millions of dollars)

December 31,	1988	1987
Assets		
Current assets		
Cash and cash equivalents	$ 220.4	$ 169.3
Marketable securities and time deposits, at cost (approximates market)	339.9	364.1
Accounts receivable, less allowance for doubtful accounts of $33.1 in 1988 and $33.7 in 1987	1,002.4	931.8
Inventories (Note 5)	723.8	676.8
Total current assets	2,286.5	2,142.0
Investments and advances		
Equity in net assets of and advances to associated companies	190.9	111.9
Other investments and advances	157.5	135.0
Total investments and advances	348.4	246.9
Plants, equipment and facilities, at cost (Note 6)	3,124.5	2,891.0
Less accumulated depreciation and depletion	1,567.7	1,499.1
Net plant investment	1,556.8	1,391.9
Intangibles resulting from business acquisitions, net of accumulated amortization	260.9	250.6
Other assets	140.5	97.6
	$4,593.1	$4,129.0
Liabilities and Stockholders' Equity		
Current liabilities		
Accounts payable and accrued expenses	$1,051.8	$ 989.5
Short-term borrowings, including commercial paper of $490.0 in 1988 and $298.8 in 1987	551.3	359.5
Funded debt installments due within one year	72.8	43.0
Income taxes payable	17.6	15.5
Total current liabilities	1,693.5	1,407.5
Funded debt (Note 7)	481.4	563.1
Deferred income taxes	120.8	109.5
Other non-current liabilities	235.4	175.9
Stockholders' equity (Notes 1, 7, and 8)		
Common stock—par value $5 per share Authorized—200,000,000 Issued—98,214,946 in 1988 and 1987	491.1	491.1
Earnings employed in the business	1,880.2	1,682.9
Accumulated translation adjustments	(9.0)	(18.4)
Less treasury stock, at cost	(300.3)	(282.6)
Total stockholders' equity	2,062.0	1,873.0
	$4,593.1	$4,129.0

Contingent Liabilities and Commitments (Note 9)

See accompanying Notes to Consolidated Financial Statements.

CONSOLIDATED STATEMENTS OF CASH

American Cyanamid Company and Subsidiaries

(Millions of dollars)

Years ended December 31,
Cash flows from operating activities
Net earnings
Adjustments to reconcile net earnings to net cash provided by operating activities:
Depreciation, depletion and amortization
Equity in undistributed net earnings of associated companies
Gain from discontinued operations
Other, net
Changes in assets and liabilities, net of effects from acquisitions/dispositions of businesses:
Accounts receivable
Inventories
Accounts payable and accrued expenses
Other assets and liabilities
Net cash flows from operating activities
Cash flows provided by (used for) investing activities
Additions to plants, equipment and facilities
Acquisitions of businesses, net of cash acquired
Additions to equity in net assets of and advances to associated companies
Proceeds from dispositions of businesses
Additions to investments—principally marketable securities
Reductions to investments—principally marketable securities
Other, net
Net cash used for investing activities
Cash flows provided by (used for) financing activities
Change in short-term borrowings, net
Funded debt:
Additions
Reductions
Purchases of treasury stock
Cash dividends
Other, net
Net cash provided by (used for) financing activities
Effect of exchange rate changes on cash
Increase in cash and cash equivalents
Cash and cash equivalents, beginning of year
Cash and cash equivalents, end of year

See accompanying Notes to Consolidated Financial Statements.

(Millions of dollars except per share amounts)

1. Summary of Accounting Policies

Consolidation—The consolidated financial statements include the accounts of American Cyanamid Company and all subsidiaries, except real estate subsidiaries whose operations were discontinued in 1974. All significant intercompany transactions and balances have been eliminated. Subsidiaries operating outside the United States and Canada are included on a fiscal-year basis ending November 30.

The equity method of accounting is used for investments in associated companies (20% to 50% owned). The aggregate cost of these investments was $86.5 and $25.4 at December 31, 1988 and 1987, respectively. Dividends of $4.8 in 1988, $6.1 in 1987 and $10.5 in 1986 were received from these companies. At December 31, 1988, the principal associated companies are Criterion Catalyst Company L.P., CYRO Industries, Lederle (Japan) Ltd. and TDF Tiofine B.V. (all 50% owned).

Currency Translation—For most of the company's international operations, all elements of financial statements are translated into U.S. dollars using current exchange rates, with translation adjustments accumulated in stockholders' equity. For other international operations, certain financial statement amounts are translated at historical exchange rates with all other assets and liabilities translated at year-end exchange rates. These international operations are generally in hyperinflationary economies, principally Latin America. Gains and losses resulting from foreign currency transactions are included in earnings of consolidated companies before taxes on income—continuing operations.

Depreciation and Amortization—Depreciation is provided primarily on a straight-line composite method over the estimated remaining useful lives of various classes of assets. When such depreciable assets are sold or otherwise retired from service, their cost, less amounts realized on sale or salvage, is charged or credited to the accumulated depreciation account. Expenditures for maintenance and repairs are charged to current operating expenses. Acquisitions, additions and betterments for increasing productive capacity or prolonging service lives of plants, equipment and facilities are capitalized. Intangibles resulting from business acquisitions are carried at cost and amortized over a period of up to 40 years unless, in the opinion of management, their lives are limited, or they have sustained a permanent diminution in value, in which case they are amortized over lesser periods.

Cash and Cash Equivalents—Cash equivalents are considered, in general, to be those securities with maturities of three months or less when purchased. The prior year's balance sheet has been reclassified to conform with this presentation.

Inventories—Inventories are carried at the lower of cost or market. Cost is determined on the last-in, first-out (LIFO) method for substantially all inventories in the United States with all other inventories determined on the first-in, first-out (FIFO) or average methods.

Taxes on Income—Deferred income taxes are provided to recognize the effect of timing differences between financial statement and income tax accounting. The provision for taxes on income is reduced by investment tax credits using the flow-through method.

The company provides taxes on the undistributed earnings of subsidiaries and associated companies where the remittance of such earnings is not considered to be indefinitely postponed. At December 31, 1988, the company has no present intention of remitting undistributed earnings of subsidiaries (including those in Puerto Rico) and associated companies aggregating $1,141.0.

Stock Split—On February 17, 1987, the Board of Directors declared a 2-for-1 split of the common stock which was effected in the form of a 100% stock dividend on June 12, 1987, to stockholders of record on May 8, 1987. All per share data included in the financial statements and notes have been adjusted for the stock split. An amount equal to the $5 per share par value of the additional common shares was transferred from additional paid-in capital and earnings employed in the business to common stock as of January 1, 1987.

Earnings Per Share—Earnings per share of common stock is based on the average number of shares outstanding during the year, 89,737,899 in 1988, 91,274,850 in 1987 and 92,850,710 in 1986. The stock options described in Note 8 do not result in a material dilution of earnings per share.

Accounting Changes—In 1988 the company adopted Statement of Financial Accounting Standards No. 95, "Statement of Cash Flows." The Statement of Cash Flows replaces the Statement of Changes in Financial Position provided in previous years. Information for 1987 and 1986 has been restated to conform with the new Statement.

The company adopted the provisions of Statement of Financial Accounting Standards No. 87 for all pension plans in the United States in 1987 and for its principal foreign plans in 1988. The effect of these changes was not material to the consolidated financial statements. Earnings for 1987 and 1986 have not been restated.

2. Discontinued Operations

During 1987 the company realized an additional net gain associated with the 1985 sale of the Formica Brand Products Group business. The gain was attributable to the early redemption of securities by Formica Corporation, the proceeds from which were in excess of the values initially ascribed to such items.

3. Acquisitions, Dispositions, Special Items

During 1988 the company acquired Conap, Inc., a manufacturer of adhesives, sealants and encapsulants for the electronic, aerospace, defense, biomedical and computer markets. The acquisition was accounted for as a purchase and did not have a material effect on operating results.

Additionally, in 1988 Criterion Catalyst Company L.P., a global catalyst manufacturing and marketing joint venture, was formed with Shell Oil Company and Shell International Chemical Company. Operating results from this business are now reflected in equity in net earnings of associated companies.

During 1987 the company acquired several businesses for approximately $100, the most significant of which was the assets constituting the Coburn Professional Products business of Barnes-Hind, Inc., which manufactures and sells intraocular lenses. The company also acquired two smaller medical related businesses. The acquisitions were accounted for as purchases and did not have a material effect either individually or in the aggregate on operating results.

Also in 1987, the company sold its Jacqueline Cochran fine fragrance and skin care businesses. Earnings of consolidated companies before taxes on income—continuing operations for 1987 include a gain of $12.0 from this sale. The effect of this item on earnings per share from continuing operations was approximately $.13.

In 1986 the company acquired several entities for approximately $240. The more significant of these were Durachemie GmbH and Co., KG, a marketer of generic pharmaceuticals in West Germany; Storz Instrument Company, a manufacturer and supplier of ophthalmic, ear, nose and throat surgical devices; and approximately 75% of Applied Solar Energy Corporation, a producer of solar cells and custom-designed photodetectors for industrial applications. The acquisitions were accounted for as purchases and did not have a material effect either individually or in the aggregate on operating results.

4. Foreign Operations

Net earnings of foreign subsidiaries, including equity in net earnings of foreign associated companies, were $209.6 in 1988, $143.1 in 1987 and $111.4 in 1986.

	1988	1987
Net current assets	$459.3	$442.8
Net other assets (principally plants, equipment and facilities)	455.6	347.8
Equity in undistributed earnings	667.3	562.3

5. Inventories

At December 31, 1988 and 1987, LIFO inventories comprised approximately 55% of consolidated inventories. It is not practicable to determine the major components of inventory under the dollar value LIFO inventory method.

	1988	1987
Finished goods	$422.2	$388.9
Work in progress	205.3	190.5
Raw materials and supplies	272.7	255.2
	900.2	834.6
Less reduction to LIFO cost	(176.4)	(157.8)
	$723.8	$676.8

6. Plants, Equipment and Facilities

	1988	1987
Land, including mining land	$ 60.8	$ 56.1
Buildings	580.8	562.9
Machinery and equipment	2,203.2	2,108.0
Construction in progress	279.7	164.0
	$3,124.5	$2,891.0

7. Funded Debt

Funded debt, excluding the current portion, is as follows:

	1988	1987
Sinking fund debentures		
7.375% due 2001	$ 62.5	$ 63.7
8.375% due 2006	84.7	87.8
Promissory note		
8.75% due 1989 to 1998	123.0	136.5
Pollution control and industrial revenue bonds		
6.8% due 2000	21.0	21.0
6.5% due 2006	22.4	22.4
8.75% due 2013	18.0	18.0
5.5% to 8.75% due at various dates through 2020	72.4	73.1
Eurosterling notes, 9.0% due 1991	55.5	54.9
Sundry obligations	21.9	85.7
	$481.4	$563.1

Annual maturities of funded debt and sinking fund requirements for the four years subsequent to December 31, 1989, are as follows: 1990—$20.8; 1991—$81.0; 1992—$27.0; and 1993—$27.0.

The 8.75% promissory note contains certain restrictions, including a limitation on the payment of dividends. Under such limitation, the amount of earnings employed in the business at December 31, 1988, which may be applied to the payment of cash dividends is limited to $713.3.

8. Stockholders' Equity

Authorized Capital—Authorized capital includes 10,000,000 shares of preferred stock with a par value of $1 per share, none of which is outstanding, and 300,000 shares of which are reserved for issuance as Series A Junior Participating Preferred Stock in connection with the Stockholder Rights Plan described elsewhere in this note.

Common Stock and Treasury Stock:

	Common Stock		Treasury Stock	
	Shares	Amount	Shares	Amount
Balance at January 1, 1986	49,107,473	$245.5	2,201,075	$(113.2)
Purchased	—	—	1,300,600	(91.9)
Issued pursuant to stock option plans	—	—	(377,837)	20.8
Issued pursuant to incentive compensation plan	—	—	(5,340)	.2
Balance at December 31, 1986	49,107,473	245.5	3,118,498	(184.1)
Adjustment for 2-for-1 stock split (Note 1)	49,107,473	245.6	3,118,498	—
Purchased	—	—	2,745,419	(119.3)
Issued pursuant to stock option plans	—	—	(589,211)	20.5
Issued pursuant to incentive compensation plan	—	—	(7,423)	.3
Balance at December 31, 1987	98,214,946	491.1	8,385,781	(282.6)
Purchased	—	—	870,715	(41.8)
Issued pursuant to stock option plans	—	—	(544,051)	21.0
Issued pursuant to incentive compensation plan	—	—	(80,691)	3.1
Balance at December 31, 1988	98,214,946	$491.1	8,631,754	$(300.3)

In 1985 the company announced its intention to purchase eight to ten million shares (on a post-split basis) of its outstanding common stock. In addition, the company is repurchasing treasury shares over a period of time to fulfill its obligations under its stock option plans. Common stock excludes 194,208 issued shares held by a subsidiary (adjusted for 2-for-1 stock split).

Stock Options—Under the company's stock option plans, key employees may be granted ten-year options to purchase common stock at not less than 100% of market value on the date of grant. At December 31, 1988, 6,409,351 shares were reserved for stock options outstanding or available to be granted. The majority of options are exercisable in cumulative installments of one-third of the number of shares commencing one year after date of grant and annually thereafter.

For options exercised during 1988 and 1987, the difference between the proceeds and cost of treasury stock utilized to satisfy the options, was recorded in earnings employed in the business, net of related tax benefits of $3.0 in 1988 and $1.3 in 1987. Differences arising in 1986 were recorded in additional paid-in capital.

Selected stock option data (adjusted for 2-for-1 stock split), are as follows:

	1988	1987	1986
Options exercised during year:			
Number of shares	707,254	652,974	870,332
Option price per share	$12.75-46.25	$12.75-34.75	$12.375-26.25
Options outstanding at December 31:			
Number of shares	3,390,989	3,267,664	3,170,718
Option price per share	$12.75-49.25	$12.75-46.25	$12.75-42.125
Options exercisable at December 31	1,704,217	1,684,897	1,464,060

Additional Paid-in Capital—The elimination of additional paid-in capital in 1987 was attributable to the issuance of shares for the stock split. Changes in 1986 were attributable to the issuance of shares for stock options including related tax benefits of $2.6.

Accumulated Translation Adjustment—Changes in the accumulated translation adjustment are as follows:

	1988	1987	1986
By category:			
Translation adjustments	$ (9.4)	$(70.6)	$(35.1)
Hedge transactions and other, net	—	(.2)	—
Decrease in accumulated translation adjustments	$ (9.4)	$(70.8)	$(35.1)
By geographic area:			
Western Hemisphere	$(11.0)	$ (3.7)	$ 3.2
Eastern Hemisphere	1.6	(67.1)	(38.3)
Decrease in accumulated translation adjustments	$ (9.4)	$(70.8)	$(35.1)

Stockholder Rights Plan—In 1986 the company issued, in respect of each share of its Common Stock, one-half of a Right (as adjusted for the 2-for-1 stock split) entitling the holder to purchase, at an exercise price of $200.00 for a full Right, one two-hundredth of a share of Series A Junior Participating Preferred Stock (subject to adjustment to prevent dilution). In the event an acquiring person obtains ownership of 20% or more, or makes a tender offer which would give the acquiring person ownership of 30% or more, of the Common Stock, the Rights become transferable apart from the Common Stock, and in the event of a subsequent merger or acquisition of the company, each full Right (other than those held by an acquiring person) will entitle the holder to purchase four shares of the Common Stock of the company at a price equal to 25% of its then market value or common stock of the acquiring company having a value equal to twice the then exercise price of the Right. The Board may redeem the Rights prior to the time they become separately transferable at a price of $.02 per Right. The Rights will expire at the close of business March 25, 1996. This description of the Plan is qualified and governed by the terms and conditions of the Rights Agreement, as amended in 1987 by the Board of Directors to account for the company's stock split.

9. Contingent Liabilities and Commitments

Rental expense under property and equipment leases was $56.9 in 1988, $49.9 in 1987 and $50.4 in 1986. Estimated future minimum rental expenses under property and equipment leases that have initial or remaining noncancellable lease terms in excess of one year as of December 31, 1988, are: 1989—$22.6; 1990—$16.0; 1991—$8.2; 1992—$5.3; 1993—$3.1; later years—$18.8 in the aggregate. The company accounts for leases as operating leases, which in all material respects complies with Statement of Financial Accounting Standards No. 13.

The company and its subsidiaries are parties to numerous suits and claims arising out of the conduct of business. Included among such suits are approximately 200 involving personal injury or death occurring in connection with administration of the company's DTP (diphtheria-tetanus-pertussis) and oral polio vaccines. Also included are approximately 275 suits involving staining of teeth by the administration of tetracycline antibiotics to young children in the 1960's. The company is currently a party to, or otherwise involved in, legal proceedings directed at cleanup of 41 Superfund sites. Many of the foregoing cases involve very large damage claims, including claims for punitive damages. In the opinion of management, the ultimate liability resulting from all pending suits and claims (after taking into account insurance coverage applicable to the events giving rise to such pending suits and claims) will not have a material adverse effect upon the consolidated financial position of the company and its subsidiaries.

10. Taxes on Income

Taxes on income are based on earnings of consolidated companies before taxes on income—continuing operations as follows:

	1988	1987	1986
Domestic	$157.4	$141.1	$102.9
Foreign	292.3	233.8	172.4
	$449.7	$374.9	$275.3

The components of the provision are:

	1988	1987	1986
Current:			
Federal	$ 27.5	$ 15.4	$ 6.4
Foreign	114.0	105.1	75.5
Other	14.5	13.3	6.6
	156.0	133.8	88.5
Deferred:			
Federal	5.1	(6.8)	(4.1)
Foreign and other	7.2	4.6	3.3
	12.3	(2.2)	(.8)
Total taxes on income	$168.3	$131.6	$87.7

Domestic and foreign earnings of consolidated companies before taxes on income—continuing operations include all income derived from continuing operations in the respective U.S. and foreign geographic areas, whereas provisions for taxes on income include all income taxes payable to U.S., foreign and other governments as applicable, regardless of the situs in which the taxable income is generated.

One of the principal components of deferred tax provisions in 1988, 1987 and 1986 relates to estimated litigation costs not currently deductible for tax purposes.

The principal components of deferred tax provisions, other than estimated litigation costs, are the excess of tax over book expenses for employee benefits (1988—$14.1, 1987—$4.3) and the excess of tax over book depreciation (1988—$8.9, 1987—$3.5, 1986—$2.5).

A reconciliation between the company's effective tax rate and the U.S. federal income tax rate for continuing operations is as follows:

	1988	1987	1986
Federal income tax rate	34.0%	40.0%	46.0%
Income subject to other than the federal income tax rate	1.7	(5.4)	(13.6)
Other, net	1.7	.5	(.5)
Effective tax rate	37.4%	35.1%	31.9%

11. Other Financial Information

Included in accounts payable and accrued expenses at December 31, 1988 and 1987, respectively, are trade payables of $357.9 and $343.0, pensions and other employee benefits of $86.2 and $67.8, checks outstanding in excess of certain domestic cash balances of $44.0 and $49.5 and other accrued expenses of $563.7 and $529.2.

At December 31, 1988, the company had $320.0 of domestic short-term lines of credit available.

Maintenance and repairs were $149.2 in 1988, $142.1 in 1987 and $142.9 in 1986. Taxes other than income and payroll taxes were $66.3 in 1988, $60.8 in 1987 and $62.9 in 1986. Advertising was $396.9 in 1988, $378.8 in 1987 and $341.1 in 1986. Foreign exchange (losses) gains were $(13.5) in 1988, $(9.2) in 1987 and $5.0 in 1986.

Cash payments during the years ended December 31, 1988, 1987 and 1986 included interest (net of amounts capitalized) of $92.1, $77.4 and $89.5 and income taxes of $154.0, $111.8 and $81.7, respectively.

12. Retirement Plans and Postretirement Benefits

The company and its subsidiaries have various pension plans covering substantially all employees in the United States and Canada and certain employees in foreign countries. Plans covering most employees provide benefits based on years of service and the employee's final average compensation. The company generally makes contributions to the plans at least equal to the amounts accrued for pension expense to the extent such contributions are currently deductible for tax purposes or as required by local employee benefit and tax laws.

The company adopted the provisions of Statement of Financial Accounting Standards (FAS) No. 87, for all pension plans in the United States in 1987 and for its principal foreign plans in 1988. The effect of these changes was not material to the consolidated financial statements.

The combined FAS No. 87 pension expense for 1988 and for United States plans in 1987 included the following components:

	1988	1987
Service cost-benefits earned during the period	$ 26.8	$ 23.4
Interest cost on projected benefit obligation	98.8	79.7
Actual return on assets	(115.4)	(5.0)
Net amortization and deferral	19.8	(73.7)
Net pension expense	$ 30.0	$ 24.4

The following table sets forth the combined funded status of U.S. plans at November 30, 1988 and 1987, and foreign plans at September 30, 1988, and the amounts recognized in the company's consolidated balance sheets at December 31, 1988 and 1987.

	1988*	1987
Actuarial present value of benefit obligations:		
Vested benefit obligation	$ 946.0	$817.1
Accumulated benefit obligation	$ 982.5	$840.9
Projected benefit obligation	$1,109.8	$942.8
Plan assets at fair value, primarily listed stocks and U.S. bonds	1,096.7	856.2
Excess of projected benefit obligation over plan assets	13.1	86.6
Unrecognized net loss	(70.8)	(62.7)
Unrecognized prior service cost	(21.6)	(22.0)
Unrecognized transition asset	73.7	16.6
(Prepaid) accrued pension cost recognized on balance sheet	$ (5.6)	$ 18.5

*Excludes accrued pension cost for foreign unfunded plans of $24.7 and the related projected benefit obligations of $34.2.

The following table sets forth the assumptions used in determining pension expense for U.S. plans. These assumptions approximate those used for foreign plans.

	1988	1987
Assumed discount rate	9.5%	9.5%
Assumed rates for future compensation increases	4.5%-9.5%	4.5%-9.5%
Expected long-term rate of return on plan assets	9.0%	9.0%

Total pension expense was $32.1 in 1987 and $50.9 in 1986.

In addition to pension benefits, employees may become eligible for postretirement health care and life insurance benefits. The expense of such benefits is recognized as the related costs are paid and amounted to $24.8 in 1988, $20.0 in 1987 and $18.3 in 1986.

13. Operations by Business Groups and Geographic Areas

The following commentary relates to the tables appearing on pages 45 and 46.

The company and its subsidiaries are engaged primarily in the manufacture and sale of a highly diversified line of medical, agricultural, chemical and consumer products (Shulton Group).

Total sales between business groups were approximately $44.5 in 1988, $55.0 in 1987 and $78.7 in 1986. These intersegment sales, which are made at cost, were not significant for any of the business groups except Chemicals ($21.7 in 1988, $42.3 in 1987 and $54.0 in 1986).

Intergeographic sales are made at prices which provide reasonable and appropriate returns based upon the respective properties employed and businesses conducted, and applicable eliminations have been applied to the intergeographic transactions.

Operating earnings consist of total net sales less operating expenses. In computing operating earnings, none of the following items has been added or deducted: general corporate expenses, interest expense, investment income, equity in net earnings of associated companies and taxes on income. 1987 operating earnings of the Shulton Group include a gain of $12.0 from the sale of the company's Jacqueline Cochran fine fragrance and skin care businesses.

Identifiable assets are those assets used in the company's operations in each business group or geographic area. Corporate assets are primarily cash and cash equivalents, marketable securities and time deposits, and construction in progress.

	1988	1987	1986
Net sales			
Medical	**$1,830.8**	$1,638.1	**$1,440.0**
Agricultural	**1,065.5**	918.7	872.9
Chemicals	**1,101.6**	1,041.5	948.1
Shulton	**594.1**	567.8	554.9
	$4,592.0	$4,166.1	**$3,815.9**
Operating earnings			
Medical	**$ 283.9**	$ 216.4	$ 184.0
Agricultural	**166.7**	124.7	84.1
Chemicals	**47.4**	68.2	50.5
Shulton	**52.0**	57.5	32.8
	550.0	466.8	351.4
General corporate expenses	**(52.7)**	(57.7)	(46.3)
Interest expense, net of investment income	**(47.6)**	(34.2)	(29.8)
Earnings of consolidated companies before taxes on income—continuing operations	**$ 449.7**	$ 374.9	$ 275.3
Equity in net earnings of associated companies			
Medical	**$ 3.8**	$ 3.0	$ .9
Agricultural	**1.5**	.5	.3
Chemicals	**18.9**	17.2	13.7
	$ 24.2	$ 20.7	$ 14.9
Identifiable assets			
Medical	**$1,318.5**	$1,292.7	**$1,074.0**
Agricultural	**786.0**	701.2	663.7
Chemicals	**732.7**	685.9	611.3
Shulton	**237.9**	217.2	222.0
	3,075.1	2,897.0	2,571.0
Equity in net assets of and advances to associated companies			
Medical	**38.1**	27.5	19.5
Agricultural	**7.6**	4.4	1.6
Chemicals	**145.2**	80.0	66.1
	190.9	111.9	87.2
Corporate assets	**1,327.1**	1,120.1	1,008.8
Total assets	**$4,593.1**	$4,129.0	**$3,667.0**
Depreciation, depletion and amortization			
Medical	**$ 78.6**	$ 64.8	$ 56.7
Agricultural	**46.7**	45.2	44.5
Chemicals	**76.3**	72.2	71.3
Shulton	**8.6**	8.4	8.3
Corporate	**11.0**	10.2	9.4
	$ 221.2	$ 200.8	$ 190.2
Capital additions			
Medical	**$ 130.1**	$ 102.8	$ 89.8
Agricultural	**99.5**	47.0	62.9
Chemicals	**120.4**	97.3	85.3
Shulton	**19.3**	15.4	17.0
Corporate	**4.5**	5.6	7.5
	$ 373.8	$ 268.1	$ 262.5

GEOGRAPHIC AREAS

	1988	1987	1986
Net sales to unaffiliated customers			
United States	**$2,831.1**	$2,618.4	$2,535.5
Other Western Hemisphere	**503.6**	433.1	389.3
Eastern Hemisphere	**1,257.3**	1,114.6	891.1
	$4,592.0	$4,166.1	$3,815.9
Intergeographic sales			
United States	**$ 260.5**	$ 211.4	$ 207.3
Other Western Hemisphere	**86.3**	85.5	87.7
Eastern Hemisphere	**67.5**	61.1	69.2
Eliminations	**(414.3)**	(358.0)	(364.2)
	—	—	—
Operating earnings			
United States	**$ 227.6**	$ 189.8	$ 150.9
Other Western Hemisphere	**73.2**	74.5	40.2
Eastern Hemisphere	**249.2**	202.5	160.3
	550.0	466.8	351.4
General corporate expenses	**(52.7)**	(57.7)	(46.3)
Interest expense, net of investment income	**(47.6)**	(34.2)	(29.8)
Earnings of consolidated companies before taxes on income—continuing operations	**$ 449.7**	$ 374.9	$ 275.3
Equity in net earnings of associated companies			
United States	**$ 2.2**	$ 7.5	$ 6.1
Other Western Hemisphere	**.8**	.6	.2
Eastern Hemisphere	**21.2**	12.6	8.6
	$ 24.2	$ 20.7	$ 14.9
Identifiable assets			
United States	**$1,958.1**	$1,842.0	$1,682.0
Other Western Hemisphere	**318.0**	283.3	279.6
Eastern Hemisphere	**799.0**	771.7	609.4
	3,075.1	2,897.0	2,571.0
Equity in net assets of and advances to associated companies			
United States	**107.3**	53.1	46.4
Other Western Hemisphere	**3.7**	2.7	2.2
Eastern Hemisphere	**79.9**	56.1	38.6
	190.9	111.9	87.2
Corporate assets	**1,327.1**	1,120.1	1,008.8
Total assets	**$4,593.1**	$4,129.0	$3,667.0

MANAGEMENT STATEMENT

Your management has prepared and is responsible for the accompanying consolidated financial statements. These statements have been prepared in conformity with generally accepted accounting principles appropriate in the circumstances and necessarily include some amounts based on management's estimates and judgments. All financial information in this annual report is consistent with that in the consolidated financial statements.

The company maintains a system of internal accounting controls designed to provide reasonable assurance that assets are safeguarded from loss or unauthorized use, transactions are executed in accordance with management's authorization, and that accounting records may be relied upon for the preparation of financial statements. The concept of reasonable assurance is based upon the premise that the costs of controls should not exceed the benefits derived from them. The system is monitored by a corporate staff of traveling internal auditors.

The consolidated financial statements have been audited by our independent auditors, Peat Marwick Main & Co. As indicated in the Independent Auditors' Report appearing on page 48, their audits were conducted in accordance with generally accepted auditing standards, which includes a study and evaluation of the system of internal accounting controls to the extent necessary to form a basis for their opinion as to the fair presentation, in the consolidated financial statements, of the company's financial position, results of operations and cash flows.

The Audit Committee of the Board of Directors, composed solely of nonmanagement directors, meets periodically with management, the internal auditors and the independent auditors to review internal accounting control, auditing and financial reporting matters. Both the internal auditors and the independent auditors have full and free access to the Audit Committee.

INDEPENDENT AUDITORS' REPORT

KPMG Peat Marwick

The Board of Directors and Stockholders
American Cyanamid Company:

We have audited the accompanying consolidated balance sheets of American Cyanamid Company and subsidiaries as of December 31, 1988 and 1987, and the related consolidated statements of earnings, earnings employed in the business, and cash flows for each of the years in the three-year period ended December 31, 1988. These consolidated financial statements are the responsibility of the company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

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

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of American Cyanamid Company and subsidiaries at December 31, 1988 and 1987, and the results of their operations and their cash flows for each of the years in the three-year period ended December 31, 1988, in conformity with generally accepted accounting principles.

PEAT MARWICK MAIN & CO.

Short Hills, NJ
February 7, 1989

FIVE-YEAR SUMMARY

(Millions, except per share amounts)

		1988	1987	1986	1985	1984
Earnings						
	Net sales	**$4,592**	$4,166	$3,816	$3,536	$3,524
	Manufacturing cost of sales	**2,289**	2,131	2,086	2,085	2,027
	Research and process development expense	**365**	314	278	251	232
	Selling, advertising and administrative expenses	**1,459**	1,339	1,180	1,065	1,013
	Interest, royalties and other income, net	**79**	78	90	83	73
	Interest expense	**108**	85	86	84	78
	Taxes on income	**168**	132	88	24	66
	Earnings of consolidated companies —continuing operations	**282**	243	188	110	181
	Equity in net earnings of associated companies	**24**	21	15	10	17
	Discontinued operations	**—**	12	—	9	18
	Net earnings	**306**	276	203	129	216
	Per share of common stock:					
	Earnings from continuing operations	**3.41**	2.89	2.18	1.25	2.03
	Discontinued operations	**—**	.13	—	.09	.18
	Net earnings	**3.41**	3.02	2.18	1.34	2.21
	Dividends	**1.1625**	1.025	.95	.95	.931
	Average number of shares of common stock outstanding (used in calculating earnings per share)	**89.7**	91.3	92.9	96.4	97.8
Other Data						
	Additions to plants, equipment and facilities	**$ 374**	$ 268	$ 263	$ 203	$ 200
	Current assets	**2,286**	2,142	1,891	1,960	1,805
	Current liabilities	**1,693**	1,407	1,126	996	948
	Working capital	**593**	735	765	964	857
	Plants, equipment and facilities	**3,124**	2,891	2,676	2,546	2,704
	Net depreciated cost	**1,557**	1,392	1,268	1,127	1,242
	Total assets	**4,593**	4,129	3,667	3,405	3,327
	Funded debt	**481**	563	584	571	526
	Stockholders' equity	**2,062**	1,873	1,721	1,644	1,668

Financial Condition

Liquidity of a company may be measured by its liquid asset position, its ability to generate funds from operations and its ability to arrange external financing.

At December 31, 1988, the company had available for its operations over $560 million in cash and cash equivalents, marketable securities and time deposits. This source of liquidity, combined with other assets convertible to cash over a relatively short period of time, provides the company with the capability to satisfy normal cash requirements from its own resources. The ratio of current assets to current liabilities is 1.35 to 1.

Net cash flows from operating activities in 1988 totaled about $468 million. This amount, combined with existing cash and cash equivalents, provided the company with adequate resources for capital expenditures of $374 million, business acquisitions of approximately $25 million, purchases of treasury stock of $42 million, dividend payments to shareholders of $104 million and other cash requirements.

In addition to the cash flow from operating activities and liquid assets discussed above, the company has $320 million in unutilized lines of credit in the United States. These lines are available to satisfy cash requirements, should such a need arise, or to support commercial paper borrowings, and are supplemented by a variety of other credit facilities maintained by foreign subsidiaries.

The company maintained a relatively consistent level of debt financing. At December 31, 1988, aggregate debt financing was $1.1 billion, equal to 34.9% of total debt and equity and is comprised of short-term borrowings of about $551 million and funded debt, including the portion due within one year, of $554 million.

The company believes it is capable of raising substantial amounts of short-term and long-term debt in the United States and other financial markets, if necessary. Based on projected internal cash generation, current levels of liquid assets and the credit capacity to support additional financing, the company expects to continue to be able to competitively finance operating cash requirements and planned capital expenditures for 1989, including the amount already committed at December 31, 1988, of about $90 million. All planned capital expenditures are intended to provide necessary capacity, to improve the efficiency of production units, to modernize or replace older facilities, and to install equipment required for protection of the environment.

Reflecting industry trends generally, as well as the effects of vaccine liability litigation, the company's liability insurance coverage (particularly product and environmental liability) for the year ending June 1989 continues to include substantially higher deductibles and lower overall limits than previously available; coverage also remains more restrictive. Exposure to catastrophic events is thus much greater.

The company considers its December 31, 1988, financial condition and anticipated 1989 operating results to be of the most significance in assessing its liquidity. Importance also can be attached to prior years' data which evidences an ability to maintain liquidity over a period of time. Data for 1987 and 1986 corresponding to the 1988 data discussed above are readily obtainable from the consolidated financial information included in this annual report.

Results of Operations

Net sales in 1988 were $4.59 billion, up 10% from $4.17 billion in 1987. **Earnings from continuing operations** in 1988 were $305.6 million or $3.41 per share, up 16% from $264.0 million or $2.89 per share in 1987. **Net earnings** in 1988 were also $305.6 million or $3.41 per share, up 11% from $275.6 million or $3.02 per share in 1987. See Note 2 to the Consolidated Financial Statements for information relating to discontinued operations.

Earnings from continuing operations increased substantially in 1988. The improvement was attributable to increased sales and operating results of the Medical and Agricultural Groups offset by a decline in operating results of the Shulton and Chemicals Groups. Shulton Group sales and operating results, excluding the 1987 gain from the sale of the Jacqueline Cochran fine fragrance and skin care businesses of $12.0 million, increased as compared to the previous year. Although Chemicals Group sales increased, operating results declined as a result of significantly higher environmental charges and strong competitive pressures to the extent that the Group was unable to offset higher manufacturing costs with increased prices. Other factors contributing to the company's improved results are the continuing benefit of programs focused on new product development, the divestiture of less profitable product lines and continued cost containment. International results also contributed to the improved results. The company benefited from the strength of foreign currencies compared to the U.S. dollar and increased sales volume in overseas markets.

Net sales in 1987 were up 9% from the $3.82 billion in 1986 while earnings from continuing operations were up 30% from $202.5 million or $2.18 per share in 1986. Net earnings were up 36% from $202.5 million or $2.18 per share in 1986.

The significant increase in earnings from continuing operations in 1987 reflected the strong performance of each of the four business groups. The improved results were primarily attributable to the ongoing benefits of programs focused on new product development, continued cost containment, the divestiture of less profitable product lines and excellent international results, aided by increased local currency sales and the strength of foreign currencies versus the U.S. dollar. Earnings of consolidated companies before taxes on income—continuing operations for the twelve months ended December 31, 1987, include a gain of $12.0 million (approximately $.13 per share) from the sale of the company's Jacqueline Cochran fine fragrance and skin care businesses.

Research and process development expenditures continue to increase each year as part of the company's commitment to provide new products and technologies in growth areas.

Foreign exchange gains (losses) increased (reduced) earnings by $(13.5) million in 1988, $(9.2) million in 1987 and $5.0 million in 1986. The losses were generated primarily by operations in hyperinflationary economies, principally Latin America. However, translation of global subsidiary earnings statements at higher foreign currency exchange rates resulting from the weakening of the U.S. dollar had a favorable effect on consolidated revenues and earnings in 1988, 1987 and 1986 versus previous years.

Taxes on income as a percent of earnings were 37.4%, an increase from 35.1% in 1987 which increased from 31.9% in 1986. Taxes on income are discussed further in Note 10 to the Consolidated Financial Statements.

In December 1988 the Financial Accounting Standards Board issued Statement No. 100, "Accounting for Income Taxes—Deferral of the Effective Date of FASB Statement No. 96," which delays the effective date of FASB No. 96 to years beginning after December 15, 1989. Accordingly, at the present time, the company intends to defer adoption of FASB No. 96 until January 1, 1990. On a preliminary basis, if income tax rates remain at the current level, and subject to resolution of pending implementation issues before the FASB, it is estimated that the adoption of FASB No. 96 will have an immaterial adverse effect on both the consolidated results of operations and financial position of the company and its subsidiaries.

continued

Business Groups' Sales and Operating Earnings, along with certain other financial data, are set forth in Note 13 to the Consolidated Financial Statements and are discussed below.

Medical Group—Sales and operating earnings increased substantially in 1988 reflecting strong performances in both domestic and international markets. The increases were due to significantly higher sales of Lederle's antibiotics, anticancer agents, surgical sutures and medical devices. In antibiotics, global sales of *Minocin* minocycline and international sales of *Pipracil* piperacillin increased. Sales of the anticancer agents *Novantrone* mitoxantrone and Methotrexate were higher than in the previous year. The medical device business contributed to the improved performance with increased sales by Storz Instrument Company, Acufex Microsurgical, Inc. and Davis & Geck, the Group's sutures business. Lederle's standard products sales were about even with the previous year while sales of consumer health products, benefiting from a new *Centrum* multivitamin formulation, increased in 1988. During the year marketing responsibility for Lederle U.S. consumer health products was reassigned to the Shulton Group to take advantage of the synergy between the Lederle and Shulton consumer markets. However, the worldwide consumer health products business continues to be reported within the Medical Group. Effective as of January 1, 1988, the company reduced, by 50%, the amount of its product liability surcharge on sales of DTP vaccine and added the required per dose excise tax to the price of DTP vaccines.

In 1987 sales and operating earnings increased significantly, with strong performances by key product lines in both domestic and international markets. Sales of pharmaceuticals, anticancer agents, standard products, and biologicals increased in 1987. Medical device sales also were higher, aided by a full year of sales from the 1986 acquisitions of Acufex Microsurgical, Inc. and Storz Instrument Company, and by the 1987 acquisition of the assets constituting the Coburn Professional Products business of Barnes-Hind, Inc. Sales of consumer health products in the U.S. were lower, primarily because of a depressed market for vitamins and calcium supplements, and aggressive price competition from look-a-like private label products. The Group continued to be favorably impacted by the weakening of the U.S. dollar. In mid-1987 the product liability portion of the DTP vaccine price was reduced in response to our ongoing evaluation of litigation costs.

Agricultural Group—Sales and operating earnings in 1988 were significantly higher than in the previous year. The results reflected higher sales of crop protection chemicals in both domestic and international markets. The entire imidazolinone product line, including *Assert, Scepter* and *Squadron* herbicides, achieved substantial sales increases. Sales of animal nutrition and health products increased, reflecting improved performances by *Avotan* growth promoter and *Aureomycin* chlortetracycline feed supplements. Vegetative and pest control chemicals sales also increased in 1988 due to strong demand for Malathion in the United States and North Africa. In 1988 the company continued its orderly withdrawal from the fertilizer business with the shutdown of the ammonium nitrate facility at Hannibal, Missouri. The Group's fertilizer business now is comprised primarily of two operating ammonia plants with about 40% of their output for nonfertilizer uses.

In 1987 operating earnings increased substantially. Total sales of the Group were higher despite our withdrawal in mid-1986 from the upgraded phosphate fertilizer business. The decline in sales, due to withdrawal from the fertilizer business, was more than offset by significantly increased sales of more profitable crop protection products. Global sales of animal nutrition and health products, and vegetative and pest control chemicals, were about even with 1986. The Group benefited from a new marketing and distribution program as well as the favorable impact of exchange. During the second quarter, the company suspended production of upgraded nitrogen products at its plant in Welland, Ontario, in response to continuing low prices and depressed demand.

Chemicals Group—Sales increased in 1988, but operating earnings were significantly lower. Substantially higher environmental charges as a result of continuing efforts to clean up certain of the Group's plant sites, and raw materials price increases resulting in higher manufacturing costs which could not be offset by increased prices, contributed to the decline in operating earnings. However, 1989 raw materials cost increases are expected to be less than those experienced in 1988. Increased investment in development efforts associated with both new technology and identified growth products: urethanes, electronic chemicals, metal-coated fibers and engineered materials, also adversely affected earnings. Sales of these identified growth products have developed more slowly than expected due to delays in government funding of aerospace projects and a longer than expected product qualification process. Other events in 1988 which, neither individually nor in the aggregate, significantly affected operating results were the transfer of the catalyst business to the new 50% owned associated company Criterion Catalyst Company L.P., the operating results of which are now reflected in equity earnings, the sale of the remainder of the Group's dyes business and the acquisition of Conap, Inc. Sales increased in several base businesses in 1988 such as acrylamide and the specialty products derived from it, including paper, water treating and mining chemicals; process chemicals; composites; industrial adhesives; polymer chemicals; and *Gyalume* chemical light products. International sales improved in nearly every area, with process chemicals reflecting the best year-to-year improvement.

In 1987 sales and operating earnings were significantly higher than in the previous year. The results reflected significantly higher sales and earnings in international markets. International sales increases included both higher volumes of exports from the United States and sales originating from overseas manufacturing sites, in part due to the favorable impact of exchange. Increased U.S. export sales were achieved for some process chemicals including acrylonitrile, fibers and engineered materials. Higher sales in international markets were achieved in mining reagents, plastics additives, water treating chemicals and methylated crosslinking resins. In the United States, sales of specialty paper resins, specialty elastomers and methylated crosslinking resins increased over the previous year. In addition, the Group benefited from a full year of sales of Applied Solar Energy Corporation, in which the company acquired an approximate 75% interest in the middle of 1986.

Shulton Group—Sales increased but operating earnings declined in 1988. However, excluding the 1987 gain from the sale of the Jacqueline Cochran fine fragrance and skin care businesses of $12.0 million, operating earnings increased about 14% from previous year results. Sales increased in nearly all major product categories. *Combat* roach and ant insecticides increased their share of the United States consumer insecticide market. *Pine-Sol* liquid cleaner sales continued to grow, especially in international markets. The Group increased its *Old Spice* toiletries market share in the U.S. men's fragrance market and maintained or improved market share in key international markets. Sales of *Pierre Cardin* men's fragrance also increased in 1988.

In 1987 sales were slightly higher and operating earnings were significantly higher as compared with 1986. Operating earnings of the Group included a gain of $12.0 million from the second quarter divestiture of the company's Jacqueline Cochran fine fragrance and skin care businesses. Excluding this gain, operating earnings were about 39% above those in 1986. Strong brand performances by *Pine-Sol* liquid cleaner, *Combat Roach Control System,* and *Old Spice* deodorant and antiperspirant permitted the Group to replace the Jacqueline Cochran volume with more profitable sales.

Operations

David R. Bethune, President
Lederle Laboratories Division

Emil C. Bosacki, President
Chemical Products Division

George P. Bywater,
Group Vice President
Latin America Group

Darryl D. Fry, President
Agricultural Division

Rolf H. Henel, President
Lederle Division
Cyanamid International

John W. Jackson, President
Medical Device Division

William H. Lash, President
Shulton, Inc. International Division

Frederick G. Ledlow, President
Fibers Division

William J. Murray, President
Venture Chemicals Division

William G. Paxton, President
Chemicals Division
Cyanamid International

Charles A. Ruibal, President
Industrial Products Division

Gerald M. Saluti, President
Polymer Products Division

John H. Taylor, President
Agricultural Division
Cyanamid International

Lawrence E. Tilton, President
Shulton, Inc. U.S.A. Division

Research Divisions

Henry M. Cenicola, Director
Shulton Research Division

James V. Gramlich, Director
Agricultural Research Division

Harry M. Meyer, Jr., President
Medical Research Division

Harold Porosoff, Director
Chemical Research Division

Ira Starer, Director
Medical Device Research Division

Services

Frederick W. Armstrong, Director
Corporate Development and
Planning Division

Alan M. Breitman, Director
Tax Division

W. Perry Brown, Director
Personnel Division

Joseph C. Calitri, Director
Public Affairs Division

Donald C. Droste, Director
Law Division

Edward A. Lustig, Director
Information Services Division

Terence D. Martin, Treasurer
Treasury Division

Robert D. Reisman, Controller
Controller's Division

St. Clair J. Tweedie, Director
Government Relations

Board of Directors

James G. Affleck
Retired Chairman of the Board
American Cyanamid Company

David M. Culver
Chairman and Chief Executive Officer
Alcan Aluminium Limited

Ronald Halstead
Former Chairman
Beecham Group p.l.c.

Arnold J. Levine
Chairman
Department of Molecular Biology
The Harry C. Wiess Professor of Molecular Biology
Princeton University

William A. Liffers
Vice Chairman
American Cyanamid Company

Paul W. MacAvoy
Dean
The William E. Simon
Graduate School of Business Administration
University of Rochester

Alexander M. Schmidt
Director
Technology Advancement Center
University Hospital Consortium, Inc.

George J. Sella, Jr.
Chairman of the Board
President and Chief Executive Officer
American Cyanamid Company

Morris Tanenbaum
Vice Chairman
American Telephone and Telegraph Company

Anne Wexler
Chairman
Wexler, Reynolds, Harrison & Schule, Inc.

Officers

George J. Sella, Jr.
Chairman of the Board
President and Chief Executive Officer

William A. Liffers
Vice Chairman

Frank V. AtLee
Executive Vice President

Albert J. Costello
Executive Vice President

George P. Bywater
Group Vice President

Robert N. Hiatt
Group Vice President

Frederick W. Armstrong
Vice President

W. Perry Brown
Vice President

Donald C. Droste
Vice President and General Counsel

Martin B. Friedman
Vice President

Richard L. Martino
Vice President

Terence D. Martin
Treasurer

Robert D. Reisman
Controller

Ellen C. Roth
Secretary

COMMITTEES

Executive

George J. Sella, Jr.,
Chairman
Frank V. AtLee
Albert J. Costello
William A. Liffers

Audit

David M. Culver,
Chairman
Alexander M. Schmidt
Morris Tanenbaum
Anne Wexler

Compensation

Morris Tanenbaum,
Chairman
James G. Affleck
David M. Culver

Nominating

James G. Affleck,
Chairman
Ronald Halstead
Arnold J. Levine
Paul W. MacAvoy
George J. Sella, Jr.,
ex officio

Pension

William A. Liffers,
Chairman
James G. Affleck
Arnold J. Levine
Paul W. MacAvoy

Public Responsibility

Alexander M. Schmidt,
Chairman
Ronald Halstead
Paul W. MacAvoy
Anne Wexler

The Company
American Cyanamid Company is a publicly held company incorporated under the laws of the state of Maine. It is a research-based biotechnology and chemical company which develops medical, agricultural, chemical and consumer products and manufactures and markets them throughout the world. Cyanamid operates 19 research laboratories and approximately 100 plants, and its 3,000 products are sold by its divisions and subsidiaries in more than 135 countries throughout the world.

World Headquarters
Cyanamid's world headquarters is located at One Cyanamid Plaza, Wayne, New Jersey 07470. The company's main telephone number is (201) 831-2000. Telex: 219136-ACYIN UR. TWX: 7109883045.

Annual Meeting
The annual meeting of stockholders is held each year on the third Monday in April. The 1989 annual meeting will be held at 11 a.m. on Monday, April 17, in the Monhegan Room of the Sheraton Inn, South Portland, Maine.

Stock Exchanges
The common stock of American Cyanamid Company is traded principally on the New York Stock Exchange (the ticker symbol is ACY). The stock also is listed on stock exchanges in Amsterdam, Basle, Frankfurt, Geneva, Lausanne, London and Zurich. Options on the stock are traded on the American Stock Exchange.

Stock Transfer Agent and Registrar
The stock transfer agent and registrar for Cyanamid's stock is The Chase Manhattan Bank, N.A. Stockholders who wish to transfer their stock, or change the name in which the shares are registered, should contact:

Shareholder Services
The Chase Manhattan Bank, N.A.
1 New York Plaza
New York, New York 10081
(212) 676-5754

Stockholder Records
Stockholder records are maintained by Cyanamid at its world headquarters. Questions concerning individual stockholder accounts, including dividends, should be addressed to:

Stockholder Records Department
American Cyanamid Company
One Cyanamid Plaza
Wayne, New Jersey 07470
(201) 831-3586

Automatic Dividend Reinvestment
There is available to all stockholders of record the convenience of an automatic dividend reinvestment service in which dividends are automatically reinvested in Cyanamid common stock. Participants also may add cash for the purchase of additional shares. Under the plan, Cyanamid pays any related bank charges and brokerage commissions. A detailed statement of each stockholder's account is mailed after each investment.

Any stockholder who is not enrolled in the plan and would like to be should contact the Stockholder Records Department at Cyanamid. Participants who have questions regarding their accounts should contact:

Dividend Reinvestment Department
The Bank of New York
P.O. Box 11002
Church Street Station
New York, New York 10277-0702
(800) 524-4458

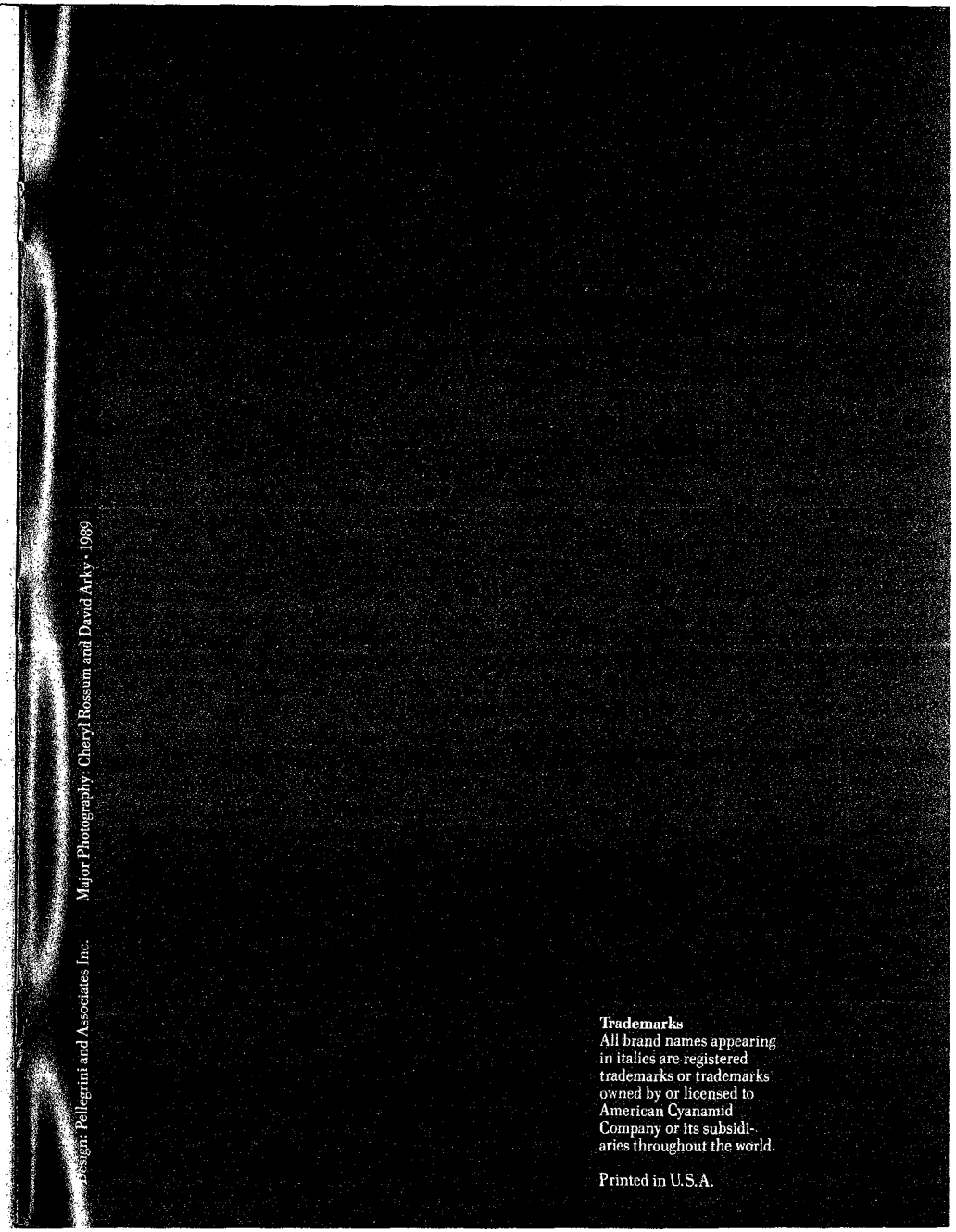
Dividend Payment Schedule
Dates for 1989 dividends, as and when declared by the Board of Directors, are scheduled as follows:

- March 31, for stockholders of record March 1,
- June 30, for stockholders of record May 31,
- September 29, for stockholders of record August 30,
- December 22, for stockholders of record November 22.

Interim Reports
Cyanamid's fiscal year is the calendar year. Interim reports covering the first, second and third quarter financial results, along with other company news, are mailed to stockholders as soon as possible after the close of the quarter.

Form 10-K
A copy of the company's 1988 annual report on Form 10-K, including financial statements and schedules, as filed with the Securities and Exchange Commission, is available free of charge to Cyanamid stockholders upon request. Copies of exhibits attached to Form 10-K also will be made available at a charge. Requests should be made in writing to:

Public Affairs Division
American Cyanamid Company
One Cyanamid Plaza
Wayne, New Jersey 07470



Design: Pellegrini and Associates Inc. Major Photography: Cheryl Rossum and David Arky - 1989

Trademarks
All brand names appearing in italics are registered trademarks or trademarks owned by or licensed to American Cyanamid Company or its subsidiaries throughout the world.

Printed in U.S.A.