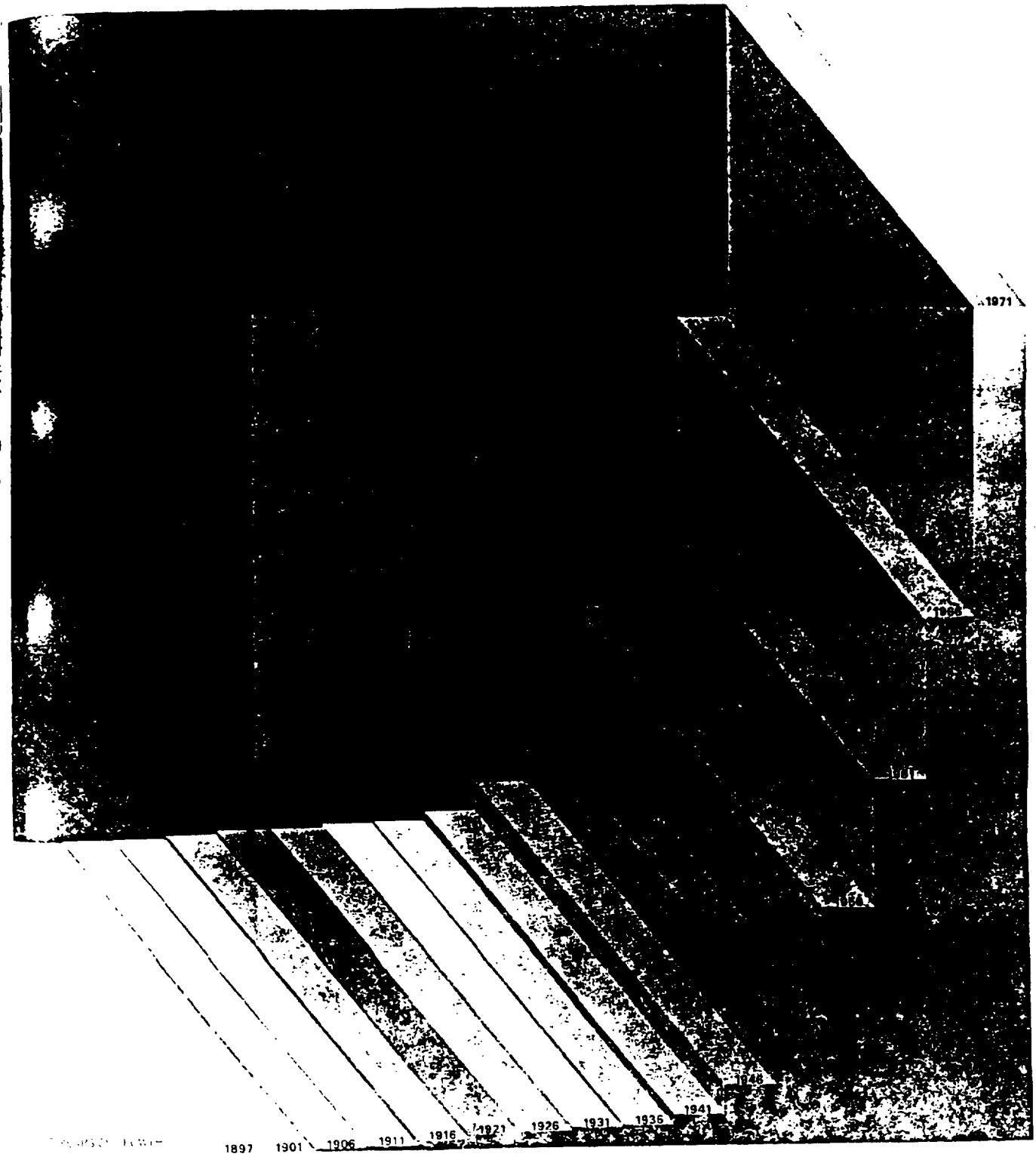
PLAINTIFF'S EXHIBIT

DOW-1269

Nineteen Seventy-One Annual Report

DOW



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DIRECTORS AND OFFICERS

BOARD OF DIRECTORS

CARL A. GERSTACKER ..... Chairman of the Board
DONALD K. BALLMAN ..... Former Senior Vice President
EARLE B. BARNES ..... Vice President
ROBERT B. BENNETT ..... Treasurer
C. B. BRANCH ..... President
MELVIN CALVIN ..... University Professor, University of California
WILLIAM R. DIXON ..... Assistant to the Director, Corporate Administration
HERBERT D. DOAN ..... President, Doan Associates Former President of the Company
HERBERT H. DOW ..... Secretary
JULIUS E. JOHNSON ..... Vice President
J. M. LEATHERS ..... Vice President
H. H. LYON ..... Vice President
ZOLTAN MERSZEI ..... Vice President
PAUL F. OREFFICE ..... Financial Vice President
LEROY D. SMITHERS ..... Chairman, Dow Chemical of Canada, Limited
MACAULEY WHITING ..... General Manager, Hydrocarbons Department, Dow Chemical USA
G. JAMES WILLIAMS ..... Vice President

EXECUTIVE COMMITTEE

C. B. Branch, Chairman; Earle B. Barnes, Carl A. Gerstacker, Julius E. Johnson, H. H. Lyon, Zoltan Merszei, Herbert H. Dow, Secretary & Alternate Member.

FINANCE COMMITTEE

Carl A. Gerstacker, Chairman; Robert B. Bennett, Herbert H. Dow, William A. Groening, Jr., A. Philip Hanmer, Frank Harlow, Paul F. Oreffice.

AUDIT COMMITTEE

Herbert D. Doan, Chairman; Melvin Calvin, Herbert H. Dow

PUBLIC INTEREST COMMITTEE

Herbert H. Dow, Chairman; Earle B. Barnes, Melvin Calvin, Herbert D. Doan, Carl A. Gerstacker, Julius E. Johnson, James H. Pearce, Executive Secretary.

OFFICERS & ASSISTANT OFFICERS

C. B. BRANCH ..... President, Chief Executive Officer
CARL A. GERSTACKER ..... Chairman of the Board
EARLE B. BARNES ..... Vice President, President, Dow Chemical USA
WILLIAM A. GROENING, JR. ..... Vice President, General Counsel
JULIUS E. JOHNSON ..... Vice President, General Manager, Life Sciences Department, Director, Corporate Research & Development
J. M. LEATHERS ..... Vice President, Executive Vice President, Dow Chemical USA
H. H. LYON ..... Vice President, Director of Corporate Administration
ZOLTAN MERSZEI ..... Vice President, President, Dow Chemical Europe, S.A.
PAUL F. OREFFICE ..... Financial Vice President
G. JAMES WILLIAMS ..... Vice President, Executive Vice President, Dow Chemical USA
ROBERT B. BENNETT ..... Treasurer
HERBERT H. DOW ..... Secretary
A. P. HANMER ..... Controller, Assistant Secretary
FIRMIN A. PAULUS ..... Assistant Controller
DAVID C. BAIRD ..... Assistant Secretary
R. W. BARKER ..... Assistant Secretary
LOIS J. HOERLEIN ..... Assistant Secretary
GERTRUDE WELKER ..... Assistant Secretary
WILSON A. GAY ..... Assistant Treasurer
DAVID N. LEVERT ..... Assistant Treasurer
JOHN VAN STIRUM ..... Assistant Treasurer
DALE A. BYWATER ..... Auditor

TRANSFER AGENTS

THE CLEVELAND TRUST COMPANY
MORGAN GUARANTY TRUST COMPANY OF NEW YORK

REGISTRARS

THE NATIONAL CITY BANK OF CLEVELAND
CHEMICAL BANK (New York)

CERTIFIED PUBLIC ACCOUNTANTS

HASKINS & SELLS

ANNUAL MEETING

The 1972 annual meeting of stockholders will be held at 2 p.m. (EST) Wednesday, May 3, in the Midland Center for the Arts, St. Andrews and Eastman Roads, Midland, Michigan. A formal notice of the meeting, with a proxy statement and form of proxy, will be mailed to each stockholder separately from this report.

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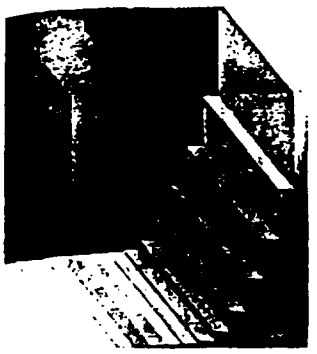
THE DOW CHEMICAL COMPANY
Annual Report for 1971



HIGHLIGHTS

Operations Summary (in millions)	1971	1970*	% Change
Net sales	$2,052.7	$1,911.1	+ 7.4
Depreciation	218.8	207.7	+ 5.3
United States and foreign income taxes	91.0	88.1	+ 3.3
Income before extraordinary items	154.4	130.0	+ 18.8
Net income after extraordinary items	154.7	102.1	+ 51.5
Earnings per share before extraordinary items (in dollars)	3.40	2.87	+ 18.5
Earnings per share after extraordinary items (in dollars)	3.41	2.26	+ 50.9
Cash dividends declared	81.0	78.5	+ 3.2
Common stockholders' equity	1,197.0	1,127.5	+ 6.2
Book value per share of common stock at December 31 (in dollars)	26.38	24.89	+ 6.0
Average common shares outstanding	45,428,561	45,287,472	+ 0.3
Common stockholders	84,633	90,975	− 7.0
Employees	47,800	47,400	+ 0.8

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Quarterly Results (in millions)

Quarter Ended	Sales 1971	Sales 1970	Earnings per Share Before Extraordinary Items (in dollars) 1971	Earnings per Share Before Extraordinary Items (in dollars) 1970*	Products and Services Operating Income 1971	Products and Services Operating Income 1970
3/31	$ 486.7	$ 456.6	$ .73	$ .70	$ 64.1	$ 59.4
6/30	526.3	493.4	.93	.83	84.9	76.1
9/30	522.7	480.4	.95	.75	81.6	68.3
12/31	517.0	480.7	.79	.59	54.2	55.8
TOTAL	$2,052.7	$1,911.1	$3.40	$2.87	$284.8	$259.6

* Restated—see Note A. page 34



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PRESIDENT'S LETTER

It Was A Very Good Year In many respects, 1971 was a milestone year for Dow beyond the simple chronological fact of reaching our 75th, or diamond anniversary, year:

—The Company exceeded $2 billion in annual sales for the first time; sales were $2.053 billion, up 7% from 1970.

—We invested more for new plant abroad than in the United States for the first time in our history.

—The Company set a new record in earnings at $3.40 per share, up 18%.

One significant event of 1971 for Dow was President Nixon's new economic program. This program has had a favorable impact on Dow, as it has on countless individuals and other companies. We have been and are a firm supporter of the President's effort to stem inflation and restore order to the world's currencies and markets.

Partly as a result of the President's program, we will again spend more than half our expansion dollars in the U.S. in 1972. To us, this is both significant and desirable.

There were several major reasons behind the very good year the Company experienced in 1971. These included our extraordinary diversity, a good product and geographic mix, higher prices, an interest cost substantially below that we budgeted, and excellent cost controls soundly administered.

The Latin American area had the largest percentage volume and earnings increases of all Dow's areas. The Canadian area rebounded strongly and had the second-best improvement.

Beginning with 1971, we are consolidating Dow's equity in the earnings of 20%-50% owned companies. The emergence of the Dow Badische Company as a strong generator of earnings in 1971 gives this change in reporting special significance; until this year, that company had operated at a net loss. The turnaround from a net minus to a good plus reinforces our confidence in the future of this enterprise, a joint venture with Badische Anilin- & Soda-Fabrik A.G.

Financial Outlook Good Capital expenditures in the year amounted to $365 million, compared to $348 million a year ago, and are forecast to continue at about the 1971 level in the current year.

Our general financial situation continues to be sound. Our liquidity is very good. One of the most encouraging aspects of our business during the year was the continued firming of chemical prices. These began turning around in 1970 after 13 years of decline, and our price index went up almost 2% during 1971.

Late in the year, the new Price Board granted authority to Dow to raise prices by a

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2% average across the board on its products. We were the first chemical company to gain this authority, and the pattern has now been extended to the chemical industry generally.

We feel we can live satisfactorily with the 2% limit. However, we are seriously concerned about the fact that controls on wages and pay have been appreciably more lax than the stringent controls imposed on prices. This imbalance can be damaging, if not fatal, to President Nixon's economic program—and thus to the welfare of all of us, individuals and companies alike.

We were encouraged in 1971 by the passage of legislation enabling the establishment of Domestic International Sales Corporations (DISCs), through which tax deferrals on exports are possible. This will help Dow U.S. exports, and we moved immediately to take advantage of this legislation.

Average Age of Directors is 52 Years The average age of the current board of directors is just over 52 years—a remarkably young average, we believe, for a major corporation.

At the January 1972 board meeting, Dr. Leland I. Doan and Max Key retired from the board of directors. H. H. Lyon, a vice president, was elected to the board, which was reduced to 17 members.

Dr. Doan was in his 55th year of service with the Company. As most will recall, he was the fourth president of Dow, from 1949 to 1962. He served as chairman of the executive committee until 1968.

Mr. Key was in his 44th year of Dow service, most recently as director of Corporate Administration, in which capacity he was succeeded by Mr. Lyon. Dr. Doan and Mr. Key have made magnificent contributions to the company during their distinguished careers. They gave devotedly of their talents for 99 years between them, and the benefits to us all are immeasurable.

During the year, the board adopted a rule requiring its members to relinquish line responsibilities at age 60. This will help us to maintain vigor in the upper reaches of the Company. In fact, Donald K. Ballman, senior vice president and an employee since 1935, set an example for other members of top management by requesting at the end of the year to be relieved of line responsibilities. He continues as a consultant and a member of the board.

Expanding Job Opportunities Along with others throughout the business world, we have reached the conclusion that there is a massive under-utilization of the talents and capabilities of women employees.

During the year, we engaged in a continuing study of this problem. We have concluded

that more intelligent use of our career women will do more than increase their job satisfaction; they represent one of our greatest potentials for productivity improvement. As a result, we have embarked upon a campaign to seek out, develop and promote female employees.

We are continuing our efforts to expand our minority employment and advancement at each and every Dow location in the United States. We are also emphasizing the development of foreign nationals in all areas of the Company. The growth of employees of highly disparate backgrounds is a matter of considerable pride and satisfaction to us, and certainly to me personally.

Environmental Battle Continues Dow is determined to provide excellence and leadership in the battle to improve our environment.

During the year, we developed global environmental performance standards for Dow plants. We believe we are the first major company to adopt such worldwide standards.

We hold that a cleaner environment is necessary not just for the sake of good citizenship, but also because it is good business. We have continued to search out areas of waste of raw material and end product alike, and have worked to decrease these wastes in every way that is technically feasible. In so doing, we increase the quantity of our salable product, reduce the dimensions of our waste problem, and help prevent pollution.

Our long-range goal, in fact, is zero pollution. We are convinced that this approach is the soundest possible to the problem and the most sensible policy for a business enterprise that strives to be both profitable and socially responsible.

Research, Manpower, and Productivity We are a research company; we are a science company. During 1971, our research and development expenditures again approximated 5% of net sales. A remarkable collection of new products is coming out of our laboratories, and some are described in this report.

I am more enthusiastic about the new products we now have in the pipeline to commercial development than I have been for many years—and I have spent most of my life in the development end of the business.

Products introduced within the past five years accounted for about 9% of our 1971 net sales in the United States and for comparable percentages in our other areas.

I also derive great satisfaction from the fact that we have been able to maintain our employee population at approximately the same level for the past four years in spite of unsettled monetary conditions and a slow economy in much of the world. We have been an exception in the U.S. chemical industry in that we have not had massive forced layoffs at any time or location—and none are needed. Our manpower costs have remained at about the same level, in percentage of sales dollar. At the same time, employee productivity has continued to climb. The net result has been that in spite of a sluggish economy, we have continued to see rising sales and increased profit per employee.

Confidence in Future It is natural for company presidents, when writing in their annual reports, to be overly optimistic. I recognize that.

I also recognize that a company of this breadth and magnitude cannot be without problems. For instance, we want to do a better job in the area of minority race employees. We are working hard on improving our employment balance, and we have already made substantial progress.

In total, I think it is fair to say that we in Dow are proud of our accomplishments and confident of our future. I continue to be optimistic about your future satisfaction with this company both as a performer and as an investment.

February 4, 1972

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GEOGRAPHIC & PRODUCT RESULTS

Geographic
(dollars in millions)

	Sales				Products and Services Operating Income			
	1971	1970	% Change	1971—% of Total Company	1971	1970	% Change	1971—% of Total Company
United States	$1,194.5	$1,139.8	+ 4.8	58.2	$149.1	$144.1	+ 3.5	52.3
Europe/Africa	485.3	430.8	+ 12.7	23.6	83.4	79.0	+ 5.6	29.3
Latin America	153.2	132.8	+ 15.4	7.5	25.9	14.7	+ 76.2	9.1
Canada	138.7	126.2	+ 9.9	6.8	14.1	10.6	+ 33.0	5.0
Pacific	81.0	81.5	− 0.6	3.9	12.3	11.2	+ 9.8	4.3
TOTAL	$2,052.7	$1,911.1	+ 7.4	100.0	$284.8	$259.6	+ 9.7	100.0

	Gross Plant Properties			Capital Expenditures			Employees (thousands)		
	1971	1970	1971—% of Total Company	1971	1970	1971—% of Total Company	1971	1970	1971—% of Total Company
United States	$1,807.6	$1,777.1	66.4	$165.1	$192.8	45.3	28.0	28.9	58.6
Europe/Africa	611.7	469.3	22.5	158.3	109.9	43.4	11.2	10.8	23.4
Latin America	76.7	67.5	2.8	13.4	18.8	3.7	5.0	4.2	10.5
Canada	210.8	190.7	7.7	24.0	24.3	6.6	2.5	2.4	5.2
Pacific	16.1	19.7	0.6	3.8	2.3	1.0	1.1	1.1	2.3
TOTAL	$2,722.9	$2,524.3	100.0	$364.6	$348.1	100.0	47.8	47.4	100.0

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Product
(dollars in millions)

	Sales			Products and Services Operating Income			Capital Expenditures		
	1971	1970	1971—% of Total Company	1971	1970	1971—% of Total Company	1971	1970	1971—% of Total Company
Chemicals/Metals	$1,006.6	$ 917.5	49.0	$123.9	$108.7	43.5	$291.2	$257.5	79.9
Plastics/Packaging	647.1	638.2	31.5	109.1	101.0	38.3	43.5	59.6	11.9
Bioproducts/ Consumer Products	399.0	355.4	19.5	51.8	49.9	18.2	29.9	31.0	8.2
TOTAL	$2,052.7	$1,911.1	100.0	$284.8	$259.6	100.0	$364.6	$348.1	100.0

WORLD OPERATIONS

UNITED STATES Nineteen seventy-one was a year of marked improvement for Dow's business in the United States. A trend for the better started in the spring, and the year ended with a 5% sales gain and a 4% rise in operating income.

Exports were up by 15%. Dow's weighted index of U.S. selling prices, which had firmed in 1970 after a 13-year decline, recorded a 1.8% gain in 1971.

Inorganic chemicals, designed products, plastic molding and extrusion materials, and Dowell Division achieved the best earnings advances.

Dow's U.S. capital expenditures declined more than 10% from 1970. U.S. manufacturing facilities operated at 81% of capacity.

Capital and operating expenditures for waste control aggregated $25 million, not including the cost of process improvements that reduce or eliminate wastes.

We continue to be optimistic that the over-all job of environmental protection can be done at no net cost insofar as Dow is concerned. This is based on our experience with increasing yields through improved manufacturing processes, recycling wastes, and marketing pollution-control products and technology to others.

Increased sales and operating income were reported by Bio-Science Laboratories, a member of the Dow Life Sciences Department. This wholly owned subsidiary reorganized to promote an orderly expansion in the clinical laboratory and related fields.

The uncertainties surrounding Phase II of President Nixon's new economic program have subsided, and the resultant buoying of confidence indicates higher business levels in 1972. That, combined with a better supply-demand balance in the chemical industry, leads us to anticipate another year of sales and earnings growth for Dow in the United States.

EUROPE/AFRICA Dow sales in Europe/Africa registered a 13% gain compared to 1970 despite generally lackluster business conditions during the closing months of 1971. The gain in operating income was limited to 6%, one factor being a sharp rise in depreciation charges stemming from heavy capital expenditures.

Largest percentage sales increases were achieved in the Benelux countries, Italy, France, the Iberian Peninsula, and Eastern Europe. Among products, hydrocarbons, functional products, and plastic molding and extrusion materials were the biggest gainers.

The current year is expected to be another difficult one for a large part of the European economy.

Capital expenditures by Dow in Europe were at an all time high The new complex at Stade, Germany, accounted for the largest portion, closely followed by the complex at Terneuzen, The Netherlands. Capital expenditures at the Dow-Unquinesa plant in Tarragona, Spain, also were sizable

Dow's European manufacturing facilities were the source of 78% of area sales and operated at 82% of capacity. The availability of product from the first operating units at Stade will be a definite stimulus to our business in 1972.

Results from the European operations of Gruppo Lepetit S.p.A., the international drug firm based in Milan, Italy, were well ahead of 1970 The European pharmaceutical market demonstrated some weakness during the year but picked up considerably in November and December. Other factors were the success of efforts to hold the line on costs, increased product availability from new facilities, and an increase in manufacturing efficiency for *Rifadin* antibiotic



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LATIN AMERICA Latin America delivered the largest percentage gain of any area, with sales and operating income increases of 15% and 76%, respectively. Improvement of operating margins on chemicals and plastics was a noteworthy contribution to the gains.

Substantial sales increases over 1970 levels were recorded in Argentina, Brazil, Chile, Peru, Puerto Rico and Venezuela. The Brazilian economy was especially strong throughout the year, and all signs point to a good year in 1972.

Wholly or majority owned local manufacturing facilities produced almost half of the Dow goods sold in the area. Petroquímica-Dow, a 70% Dow-owned company in Chile, operated satisfactorily throughout 1971.

A strong network of Dow terminals is being established in Latin America, enabling us to serve the needs of customers from many locations. Terminals are now in operation at Tuxpan, Mexico; Cartagena, Colombia; San Antonio, Chile; La Plata, Argentina; and Guarujá, Brazil. A site has been purchased at Puerto Cabello, Venezuela, for future plant and terminal development.

Life Sciences activities accounted for about 30% of area sales. The bulk of these sales are made through affiliates of Gruppo Lepetit and through Laboratorios Industriales Farmaceuticos Ecuatorianos.

CANADA Despite revaluation of the Canadian dollar early in the year, which increased the competition from imports, Dow's Canadian operations increased sales 10% and operating income 33% in 1971.

Agricultural products were the biggest gainer. Chemicals and packaging materials also recorded sizable advances. Although construction materials performed very well, the over-all results from plastic products were disappointing. Sales of Life Sciences products were off, mainly because of increased competition in measles vaccines and other biologicals.

Business conditions in Canada were sluggish for the first seven months, continuing the slow pace of 1970, but the trend was up for the rest of the year. The supply-demand balance for products made by Dow Canada was generally good, and the company's manufacturing facilities (which supply 77% of the Dow product sold in Canada) operated at 86% of capacity.

The 1972 outlook is for continued improvement in economic conditions in all regions of the country.

PACIFIC Dow sales in the Pacific were about level with 1970. However, operating income for the area was up 10%, primarily because of improved selling prices and the exceptionally strong growth of agricultural products.

Australia/New Zealand took over from Japan as our No. 1 sales region with a 24% gain from the previous year. Demand for our products was firm across the board.

In Japan, sales declined 25% as a result of generally depressed business conditions, particularly in some segments of the petrochemical industry. No significant improvement in this industry is foreseen for first half 1972; however, prospects for Dow agricultural products are exceptionally bright. A new commercial subsidiary of Gruppo Lepetit began operations in Japan in 1971.

Dow's business in South and East Asia prospered despite varied political and economic conditions. Well balanced product and geographical mix protects us from the effects of unfavorable developments in any individual country.

Dow's largest manufacturing unit in the Pacific Area at Altona, Australia, operated at 79% capacity and produced about 14% of total Pacific Area Sales.

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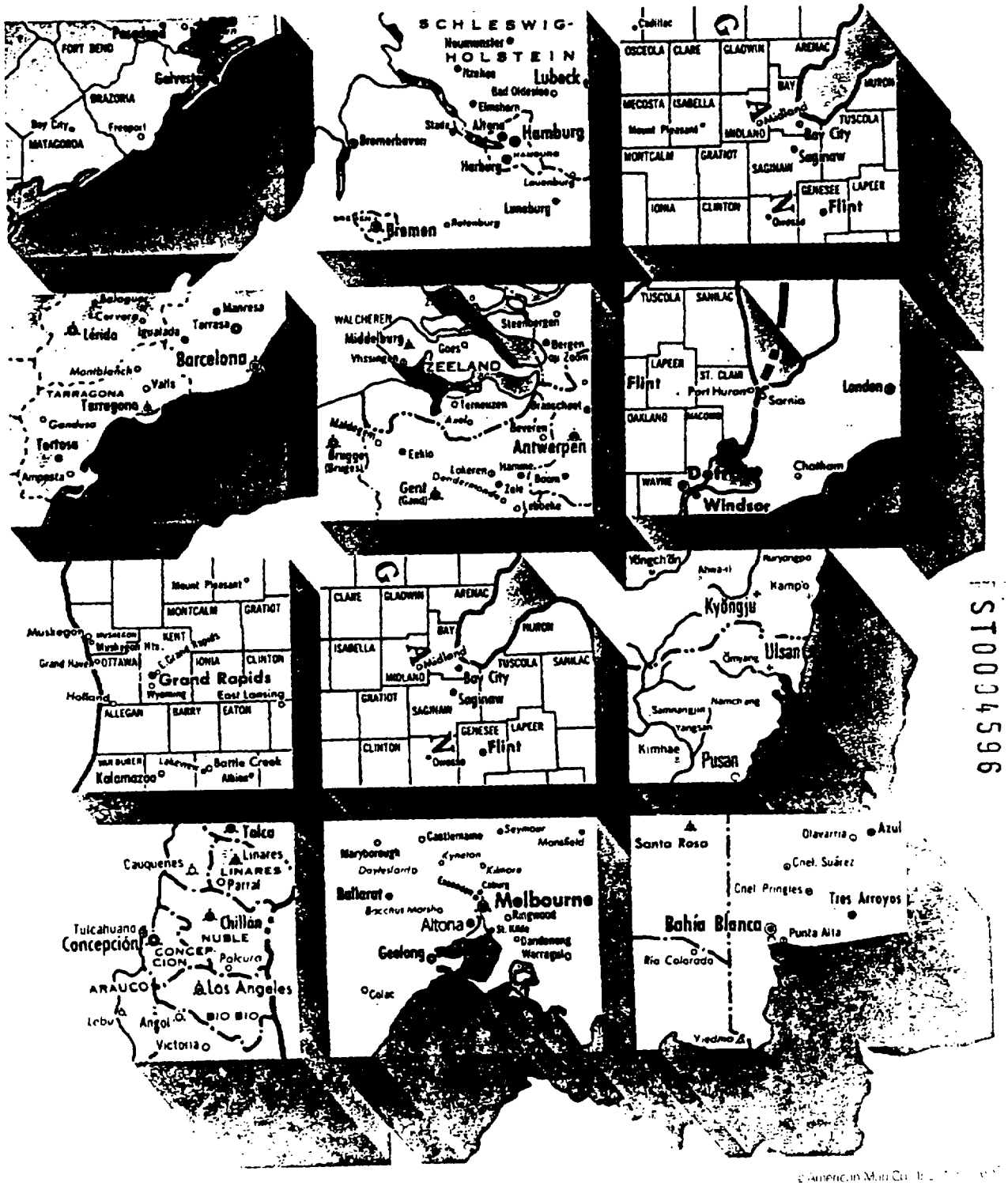

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WHAT HAPPENED WHERE IN 1971

A capsule view of major events at Dow locations

Freeport, Texas—World's largest phenol plant (400 million pounds per year capacity) comes on stream in Oyster Creek Division . . . Ethylene modernization program in Texas Division resumes; older units replaced as result will be kept on standby pending future access to foreign feedstocks for ethylene . . . Million-dollar laboratory for urethane chemicals development opens.

Stade, Germany—Building pace quickens at Dow's new chlor/alkali complex with $110 million worth of facilities under construction and first units scheduled on stream in 1972.

Midland, Michigan—Ten thousand citizens publicly rally behind Consumers Power Company's proposed nuclear plant, for which an Atomic Energy Commission construction permit has been pending. The facility would provide an economical and clean source of electric power and steam for Dow's Midland Plant and the surrounding community.

Tarragona, Spain—Large-scale construction program in progress at Dow-Unquinesa (85% Dow owned). High-density polyethylene plant completed, existing low-density polyethylene plant expanded, and ethylene storage facilities built. Plant for *Voranol* polyols under construction.

Terneuzen, The Netherlands—Second naphtha cracker with capacity of 400,000 metric tons per year constructed.

Sarnia, Ontario—Use of mercury in chlorine production by Dow Chemical of Canada, Ltd., to be phased out, completely eliminating mercury losses to the St. Clair River now averaging less than a tablespoon per day . . . New Dow Canada "total energy" plant due for start up in 1972 will provide bulk of the electric power and all of the steam required by Sarnia Division, ending reliance on price-escalating purchased power. Plant will be fueled with Alberta natural gas, contributing still further to pollution-abatement program that began three years ago when fuel oil and natural gas were substituted for coal to generate steam.

Grand Rapids, Michigan—Dow phosphate process, operated for the first time with fully automated equipment, meets state standard of 80% phosphates removal. Forty five other municipal wastewater treatment plants where the process has been demonstrated also meet this standard. U.S. Surgeon General's opinion that nonphosphate detergents are unsafe puts new emphasis on removal of phosphorus at wastewater-treatment plants as the only real solution, since enough phosphorus from other sources than detergents would stimulate algae growth.

Bay City, Michigan—Record year for Dow exports through the Port of Bay City with 92,000 short tons shipped compared to previous record of 51,000 tons. Dow is urging extension of Great Lakes navigation season from the present eight months to 11 or 12 months.

Ulsan, Korea—Construction of low-density polyethylene and vinyl chloride monomer plants started by Korea Pacific Chemical Corporation (50% Dow owned).

Concepción, Chile—Dow's biggest plant start up in Latin America completed as low-density polyethylene, ethylene dichloride, vinyl chloride and polyvinyl chloride plants of Petroquímica-Dow S.A. (70% owned) come on stream.

Altona, Australia—Further diversification at Dow Chemical (Australia) complex with start of construction of propylene oxide derivatives plant.

Bahia Blanca, Argentina—Dow participation in petrochemical complex restructured. Argentine government takes responsibility for building an ethylene plant. Dow plans to build "downstream" plants when practicable

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THE GLOBAL MONEY CRISIS OF 1971

The year's biggest economic event and how it affected Dow Chemical

From a business viewpoint, the year 1971 probably will be remembered vividly as the year of the money crisis.

It became clear early in the year that the dollar was in trouble as the U. S. faced a huge deficit in its balance of payments with other countries.

The real beginning of these problems is rooted in the years following World War II. The U. S. came out of that war strong and prosperous and began helping the rest of the world back on its feet. That was fine—and necessary—but it was a case of too much for too long.

Starting from a strongly positive balance of payments position, it was easy for the U. S. to give vast sums in foreign aid and to set up troops overseas to help keep the peace.

But over a long period the situation changed. The balance of payments gradually deteriorated until several years ago there were more dollars leaving than coming into the country—even though exports exceeded imports. Then in 1971, even that changed—the U. S. imported more than it exported for the first time in the 20th century. In plain words, the U. S. had been decapitalizing—much like a family living beyond its income, or a company paying higher dividends than its earnings.

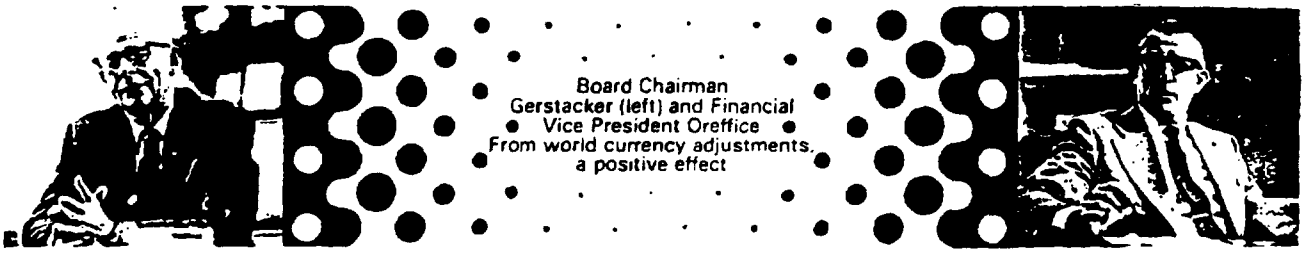
By the spring of 1971, things had begun to reach the crisis stage. Confidence in the dollar reached an all-time low. Huge amounts of dollars were used abroad to purchase other currencies, deluging the central banks of Europe and elsewhere.

Extensive revaluation of currencies (by allowing exchange rates to "float" upward) followed in foreign countries.

On August 15, the U. S. faced the basic issues squarely by imposing a temporary 10 per cent surcharge on imports and stopping the exchange of dollars for gold. At the same time domestic inflation was attacked by putting a freeze on wages and prices.

Economic turmoil among America's trading partners increased in August, but by mid-December, with the promise of dollar devaluation and revaluation of other major currencies, the world monetary crisis was over.

What does this mean in the United States?



Board Chairman Gerstacker (left) and Financial Vice President Oreffice
From world currency adjustments, a positive effect

Devaluation is nothing to be ashamed of. It is simply a long overdue recognition of the way things are, a natural consequence of the U. S. trying to do too much to help the rest of the world.

Devaluation will make the exports of U. S. companies cheaper in other countries and therefore more competitive while imports to the U. S. will cost more. The combination of these factors should improve the U. S. balance of trade.

In negotiation with other countries the Administration has recognized that an improvement in our trade balance is not going to be enough in the long term. So the U. S. is trying to persuade the other developed nations to pay for a larger share of defense expenditures. Major efforts are also being made to remove some of the artificial restrictions that have long hampered U. S. exports.

As far as Dow is concerned, devaluation of the dollar and revaluation of other currencies will have a positive effect on earnings.

For one thing, devaluation will make Dow's American-made products even more competitive in overseas markets. So we will increase our exports from the U. S. In fact, we already have exported products to countries where we have never sold before.

In other parts of the world, our contracts are in local currency and if any foreign currency revalues, our sales prices in that country also revalue. In effect, we sell at higher dollar prices.

There are some negatives also. We have borrowed money in foreign currencies, and the net effect of changing currency values will be a slight loss. Additionally, we have some exchange losses in developing countries, but these have nothing to do with the dollar devaluation. These losses occur every year and are almost a cost of doing business in such countries.

On the other hand, Dow has some $500 million in net fixed assets in countries that revalued their currencies, and these really are worth more dollars now. But we have not taken a credit for this on our books.

During various stages of the monetary crisis, Dow's business overseas and in the United States continued to flourish. This was largely the result of Dow's financial and banking network around the world, which permitted us to continue transactions even though currency exchange markets were often closed.

Dow was fully competitive in the world market as we entered 1971. The realignment of world currencies has improved the U. S. competitive position by 10% to 20%. Dow's competitive position has likewise improved.

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PARTLY OWNED COMPANIES

Dow's share of the sales of 20%-50% owned companies aggregated approximately $350 million, up 22% from 1970. In 1971, for the first time, Dow's equity in the net income of these companies is consolidated in our financial statements—$18.9 million in 1971, compared to $6.8 million in 1970, both before extraordinary items. Previously, only the dividends from these companies were consolidated.

Among these companies, the major development in 1971 was *Dow Badische Company's* dramatic change from an operating loss to a substantial profit. This was due to improved product quality, increased capacity, and operating efficiencies. The company's sales have continued to rise at a faster rate than those of the industries it serves. Expansions were completed in nylon 6 carpet and fine-denier yarns and acrylic fibers. Universal Textured Yarns, Inc., acquired by Dow Badische in 1971, was reorganized and enjoyed a very profitable year. Bentex Mills, Inc., 90% Dow Badische-owned, also contributed to the profit turnaround. Bentex is a unique, fully integrated double-knit facility performing commission knitting, dyeing, texturizing, and finishing and is currently tripling its capacity.

Dowell Schlumberger, which performs the same oil-field services in the rest of the free world as our Dowell Division in North America, rebounded from a slow 1970 with strong gains in revenues and net income. The company has been experiencing a salutary diversification of revenue sources and is no longer dependent on drilling activity in a limited number of countries for its growth.

Sales and operating income of *Dow Corning Corporation* increased moderately in a generally difficult year for many of the major industries it serves. The company increased from 40% to 100% its ownership in Midland Silicones Ltd., a major silicones producer in the U.K. Internally, the company took much constructive action to stimulate improved pricing, productivity and profit levels.

In the face of a sharp downturn in the Japanese economic growth rate, *Asahi-Dow Ltd.* set new sales records. The company posted one of the best earnings records of any Japanese company in the petrochemical field.

During a year of international financial turmoil, *Bank Mendes Gans,* Amsterdam, improved Dow's flexibility in the European currency markets through its currency clearing and collection systems. *Banco Cidade de São Paulo* continued its growth and is now operating four branches in key Brazilian cities.

Austral-Pacific Fertilizers, in which Dow held a substantial minority interest, and other Australian fertilizer companies of the ICI of Australia group have been combined in a new company, *Consolidated Fertilizers Ltd.* This reorganization should produce improvement in what has been a poor earnings performance. Dow owns slightly less than 20% of the new company.

In Korea, scheduled progress was made on construction of the low-density polyethylene and vinyl chloride plants of *Korea Pacific Chemical Corporation.* Operations of this $45 million complex are scheduled to commence in third quarter 1972

During 1971, Dow realized $3.7 million (before income taxes) from the sale of its 50% interest in Phrix-Werke A. G., the German fiber producer. Our entire $43.3 million investment in the company had been written off in 1970 after the firm experienced serious financial difficulties.

ST0004599

1971: ANOTHER GREAT YEAR FOR NEW DOW PRODUCTS AND APPLICATIONS

Starting at the top left and winding down the rock face are ■ composite foam (thermoplastic plus urethane) for improved automotive seating and crash padding ■ *Dow* Pressure Relief Joint Filler (made from *Ethafoam* polyethylene foam) for highways ■ *Zectran* insecticide (see page 24) ■ *Dow* Window Cleaner and Defogger ■ thin-wall beverage bottle made from Dow polyethylene ■ plastic pitcher combining wood-grain and smooth surfaces ■ Dow cartridge filter for drycleaning machines ■ *Dow* Windshield De-icer ■ *Dow* Radiator Coolant Additive ■ *Dow* Radiator Flush ■ *Dow* Radiator Sealer ■ "Thermo-Serv" vacuum beverage bottle with tough outer shell of Dow ABS plastic ■ *Dow* Oven Cleaner with new lemon scent ■ foam jacket for thin-wall soft drink bottle ■ laboratory device based on hollow fibers (an extension of our artificial kidney technology) ■ sandwich panel for recreational trailer with core of *Styrofoam* brand plastic foam ■ *Touch of Sweden* hand lotion in a new, extra-rich formulation ■ *Dow* Auto Freshener ■ *Rifadin* antibiotic, newly registered in the United States (see page 22).



The young lady with the outstretched arm is swathed in polyester double-knit fabric that underwent the necessary scouring via new, continuous process based on Dow solvents and technology, preventing stretch and distortion ■ The young man holds a flask filled with *Dowex* ion exchange resins—Dow now produces a complete line of resins for water softening and other conditioning chores ■ To his left and across the way are T-valves representing a new line of Dow plastic-lined piping products with liners of Teflon fluorocarbon ■ To his right is a Parsons table molded all in one piece from Dow ABS plastic resins. On the table are a pair of cups and a sheet of the co-extruded, multilayered thermoplastic film from which they were formed ■ The young lady at left is holding a "Humidrawer" refrigerator storage compartment, of *Tyril* styrene-acrylonitrile plastic ■ Opposite is a snowmobile seat made of urethane foam with an insert of *Ethafoam* polyethylene foam for shock absorption ■ To her left is a vanity top with an acrylic-sheet surface; *Saran* microspheres in the backing help prevent shrinking and warping ■ Behind is a piece of "Fashionaire" luggage with framework of Dow magnesium extrusions.



ST0004601

HOW DOW'S MAJOR PRODUCTS FARED IN 1971

CHEMICALS Sales of inorganic and organic chemicals and derivatives increased moderately and operating income was up substantially. Major factors were the continuation of the tight worldwide supply-demand balance for caustic soda and sustained healthy growth for propylene oxide and its derivatives. *Methocel* cellulose ethers for paint thickening and other uses were very strong

Sales of magnesium oxide and hydroxide were adversely affected by the recession in the U.S. steel industry; ethylene dichloride and vinyl chloride monomer, by a slowing in the worldwide growth rate for polyvinyl chloride. Ethylene oxide and its derivatives were in excess supply.

As expected, sales of ethylene dibromide for use in antiknock fluids in leaded gasoline began to slip, but we see other uses such as brominated fire retardants taking up the slack.

Price attrition hindered the performance of *Voranol* polyols in the early months of 1971, but both pricing and demand strengthened in the second half. As the major supplier of these urethane chemicals we are forecasting an average 14% growth rate for flexible urethane foams over the next five years.

Global demand for chlorinated solvents was substantially unchanged but is expected to improve in 1972 with better economic conditions. The increasing worldwide emphasis on ecology and toxicology will enhance the market for *Chlorothene* solvents, which are low in toxicity and can be recycled.

METALS Primary magnesium had a good year. Sales, including those to the aluminum industry for alloying, were slightly higher and operating income rose substantially. Construction of our new primary plant at Dallesport, Washington, has been delayed pending clarification of power availability and market demand. Primary magnesium sales are expected to be adversely affected in 1972 by the increasing competition of U.S. and Japanese small cars with the German Volkswagen, which uses about 40 pounds of magnesium castings per car, and by the advent of major new U.S. competition in the primary magnesium industry.

PLASTICS Again, as in 1970, global sales of our plastic molding and extrusion resins rose moderately and operating income gained substantially. The profit increase was aided greatly by low-density polyethylene; prices were slightly higher and volume was up, primarily in Europe. Operating income from high-density polyethylene was off because of industry over-capacity and price softness. For *Styron* polystyrene, our major plastic material, operating income gained.

Sales of Dow ABS (acrylonitrile-butadiene-styrene) resins improved considerably. In 1972, the product line will be broadened with the introduction of high-impact formulations, and some new capacity will be available.

Operating income from coatings was up substantially.

The recreational-vehicle and low-temperature space-insulation markets contributed to increased sales of *Styrofoam* brand plastic foam, offsetting weakness in the construction market. Profits from *Styrofoam* were up fractionally. The use of *Ethafoam* plastic foam in safer seats for snowmobiles promises to help this product continue its modest sales growth and strong contribution to profits.

Significant profit gains for plastics are expected again in 1972.

PACKAGING Despite level sales, operating income was up markedly, with commercial films as the major contributors. In the face of increased competition, *Saran Wrap* plastic film (industrial) maintained its performance on the strength of manufacturing economies and higher prices. *Polyfilm* polyethylene film continued to benefit from earlier manufacturing improvements and judicious selection of markets.

A new, highly efficient plant and continued market acceptance, particularly in window envelopes, put *Trycite* polystyrene film on a profitable basis. Sales of *Saranex* co-extruded multilayered films began what appears to be a sustained rise as new uses developed in pouch-packaged beverages.

LIFE SCIENCES Over-all sales and operating income gained substantially.

Rifadin antibiotic for use in treating pulmonary tuberculosis continued its worldwide sales growth, and registrations were granted in the United States and Japan. Gamulin Rh, Rh. (D) Immune Globulin (Human), a means of preventing hemolytic disease in the offspring of Rh-negative mothers, was licensed in the U.S. *Equilid* sulpiride, a new prescription tranquillizer, was launched in Brazil.

AGRICULTURAL PRODUCTS Sales improved substantially. Operating income declined because of higher depreciation charges and major new plant startup costs.

Herbicides made the largest sales gain as the price-strengthening trend which began in 1970 continued. Particularly outstanding were the performances of *Tordon* herbicide for rangeland brush control, phenoxy herbicides (2,4-D and 2,4,5-T), and phenolic herbicides, of which *Premerge* dinitro weed killer is an example.

Our coccidiostats for the control of poultry disease and fumigants for controlling termites and a variety of soil and storage pests were additional major contributors to operating income.

Zectran and *Dursban* insecticides, *Plictran* miticide and *Kedlor* biuret, a nonprotein nitrogen source for cattle, continued to show promise for the future.

CONSUMER PRODUCTS Increased competition for *Saran Wrap* brand plastic film (household) and high launching costs for new products depressed operating income, although over-all sales were slightly higher. *Handi-Wrap* brand plastic film again outsold all other polyethylene household wraps combined. A new embossed, high-cling formulation of *Handi-Wrap* (with "Touch Control") was introduced early in 1972.

Aztec suntan products and Handi-Wrap bags were withdrawn after failing to meet regional marketing goals. Three other products in regional marketing—*Ziploc* brand plastic food storage bags, *Dow Bathroom Disinfectant Spray* and *Touch of Sweden* hand lotion—continued to perform satisfactorily.

DOWELL DIVISION Price strengthening for oil- and gas-well services restored Dowell's operating income to 1969 levels. *Gas Frac*, a new process for stimulating gas wells, was introduced and achieved production increases substantially greater than conventional processes in the first 18 wells treated.

ST0003460

A Time of Faith and Ferment

Don Whitehead evokes the brash, confident America of 1897, the year Dow Chemical was founded.



Gold mining in the Klondike Region, Yukon Territory. In four (repaid) years, $100 millions.

They have been called "The Fabulous Years"—those last years of the Nineteenth Century when the United States was emerging as the lusty, brawling new giant of the world's industrial powers. And fabulous they were.

It was in those years that The Dow Chemical Company was born in the little backwoods town of Midland, Michigan, an event scarcely worthy of notice in the larger world. And yet as a child of this remarkable era—and seeming to draw strength from the raw energies of the times—it would grow in 75 years into a globe-girdling enterprise with assets of about $3 billion. And this sum was roughly six times the average annual expenditure of the U. S. Government from 1896 to 1900.

The Dow Chemical Company was incorporated May 18, 1897. On that date a small group of Ohio and Michigan businessmen declared themselves willing to risk $200,000 on this proposition: that 31-year-old Herbert Dow could profitably extract chemicals from Michigan's subterranean brine by using a new process of his own devising. They took the risk even though Dow was less than 10 years out of Cleveland's Case School of Applied Science, his process had proved faulty in the past, and he had twice failed to produce results that could match his promises.

But these were scarcely believable times when men and women engaged in scarcely believable pursuits with an unshakable faith in themselves and the future of their country.

Canny Senator Mark Hanna voiced the sentiments of many when, after masterminding the election of William McKinley to the Presidency in 1896, he sent a jubilant telegram to the victorious candidate saying, "God's in his heaven, all's right with the world."

Of course, all wasn't right with the world. The chasm was infinitely wider between the rich and the poor, the white and the black, and the worker and his employer than it would be 75 years later. Anarchists even then were crying for the overthrow of the Establishment and creating terror with bombs. Disputes between labor and management often exploded into bloody riots. The issues of sound money (the gold standard) versus free silver, and protective tariffs versus free trade, were bitterly fought. More and more women were voicing their outrage over the denial of the vote. And the Federal Government did little to control the excesses of money barons and powerful business monopolies.

The famous newspaper publisher, Joseph Pulitzer, found a new word to describe the Americans of those years. The word he coined was "indegoddampendent." And yet the often unbridled independence, the turmoil, the divisions and the stark contrasts—as well as the absurdities of the time—were merely a part of the mosaic depicting the movement of America toward the Twentieth Century.

What was happening in the outside world while Herbert Dow was struggling to get his little chemical company underway in 1897? Let's take a look back to that year . . .

Sod-busting farmers, miners, tradesmen, land speculators and adventurers were pouring westward to seek their fortunes in Oklahoma Territory, the Dakotas, Nevada, Utah, Kansas and other vast stretches of the last frontier. A great many succeeded and some failed, but all could sympathize with the Texas settler who had abandoned his cabin and left a sign tacked to the door: "250 miles to the nearest post office; 100 miles to wood; 20 miles to water; 6 inches to hell. God bless our home! Gone to live with wife's folks."

One out of every 19 Americans owned a bicycle and they were spending $12 million a year on spare parts and accessories. Bicycle racing was among the most popular sports and drew as many as 25,000 spectators, mostly on Sundays. This Sabbath racing moved one national magazine to declare: "It should be prohibited. The spectators of Sunday bicycle racing are not the class which stands for law and order."

F. E. Stanley founded his Stanley Steamer Company. Two years later one of his automobiles steamed to the top of Mt. Washington in New Hampshire, to the hurrahs of the few who were interested in such self-propelled contrivances. The automobile hardly seemed a challenge to the horse although the challenge was just around the bend.

Railroads were binding the nation together with bands of steel criss-crossing the land—and 90% of the country's steel production was going into rails. The United States had half of the world's railroad mileage, and a statement by James A. Garfield 24 years earlier still was valid: "The railroad is the greatest centralizing force of modern times."

The cry of "Gold!" echoed from the Klondike in Canada's Yukon Territory, luring tens of thousands of men and women to the frozen north in the century's last great frenzied rush for the yellow metal.

The United States was producing and consuming more goods than any other



McKinley delivering inaugural address. On the agenda, tariffs; in the wings, war.

Edison with his motion picture machine. For an incredulous public, lifelike figures.



Pop literature of the 1890's. Weekly transfusions of Wild West.





Herbert Henry Dow
in 1897
High hopes, a process
and $200,000



The resplendent
Lillian Russell
For 'Diamond Jim' Brady,
too good a friend

Critic Bryan After
'Cross of Gold' speech
To cure depressions,
easy money



nation, and merchant princes were revolutionizing selling techniques. Marshal Field's department store in Chicago—the first of its kind—was the merchandising showplace of the Middle West. The mail-order houses of Montgomery Ward and Sears, Roebuck and Company were tapping the huge rural market with their catalogs offering everything from the latest women's styles to farm gear. And Frank W. Woolworth's five-and-dime stores were spreading across the country.

That summer in London, Queen Victoria celebrated her 60th year on the throne of England with pomp and pageantry the likes of which the world had seldom seen. Britain was at the zenith of her power and the Empire seemed destined to last forever. As to the relative power of the United States and England, most Englishmen would have agreed with a Tory journalist who had written to the *Times*: "The English and not the inhabitants of the United States are the greatest power in the two Americas; and no dog of a Republic can open its mouth to bark without our good leave." But such posturing was not uncommon on both sides of the Atlantic.

The United States was moving toward war with Spain. Public sentiment favoring the Cuban rebels' fight for independence was mounting, fueled in part by phony atrocity stories trumped up by reporters for William Randolph Hearst's New York *Journal* and to a lesser degree by Pulitzer's New York *World*. When the governor of New York appealed to Speaker of the House Tom Reed to dissuade the representatives from voting to intervene in Cuba, Reed replied: "Dissuade them! The governor might as well ask me to step out in the middle of a Kansas waste and dissuade a cyclone." And war with Spain came the following year.

Books on etiquette were popular, instructing the uncertain how to acquire social and business graces. But none was more popular than "Professor" Thomas E. Hill's *Manual of Social and Business Forms*, a perennial best-seller which, among other things, advised the reader to "never give a lady a restive horse." Furthermore, it was "the gentleman's province to assist the lady in mounting", a procedure for which Professor Hill provided explicit instructions.

Beards and mustaches were popular with the men (even Herbert Dow had a mustache for a time to make himself look older) and they sported derbies, cutaway coats with tight-fitting trousers, vests adorned with heavy watch chains, and shirts with high stiff collars. Women rustled when they walked in their floor-length dresses and petticoats of silk. They were corseted to achieve hour-glass figures, flounced, bustled, and hobbled—with long hair piled high and covered with huge hats held in place by long hatpins.

In the glitter of Broadway, none glittered brighter than the beauteous Lillian Russell (when Diamond Jim Brady stuffed her hand with negotiable bonds and offered matrimony she refused him on the grounds that she liked him too much to marry him—presumably keeping the bonds). And another star was wasp-waisted Anna Held, whose fame rested largely on the rumor that she bathed daily in a tub full of milk. But while champagne corks popped and men snapped women's garters with frivolous frequency, the era hardly supported the title of "The Gay Nineties" beyond the lights of Broadway. Life was still too real and earnest in the mills and factories and on the farms of America.

People in towns and cities were flocking to see "the most wonderful of all modern inventions"—the Edison Moving Picture Machine. The posters promised "views of railroad trains going full speed" and moving figures "so lifelike, so true to nature, so perfect in detail . . . . . that the audience can scarcely realize that what they see is only a picture and not reality."

Among the footnotes to the year: Bob Fitzsimmons whipped Gentleman Jim Corbett for the heavyweight boxing championship of the world, 14 rounds at Carson City, Nevada; Francis Pharcellus Church wrote an editorial in the New York *Sun* assuring eight-year-old Virginia O'Hanlon that "Yes, Virginia, there is a Santa Claus"; Typhoon II won the Kentucky Derby and a purse of $4,850; no one paid a federal income tax and the public debt was a mere $1.25 billion as compared to the 1970 public debt of $370.9 billion; and music lovers heard for the first time "The Stars and Stripes Forever" by John Philip Sousa, "On The Banks of The Wabash," and something else called "You're Going Far Away; or, I'm Still Your Mother Dear."

By any measure, the year 1897 which saw the beginning of The Dow Chemical Company was a fabulous time in a fabulous era.

Twice the winner of a Pulitzer Prize for journalism, Don Whitehead since 1956 has turned to book-length reporting, starting with *The F.B.I. Story*. His most recent title, *Attack on Terror*, published in 1970, describes the civil-rights struggle in Mississippi. Mr. Whitehead is the author of *The Dow Story* (1968). He makes his home in Concord, Tennessee

S100495

ST0004606

MAKING IT AT DOW

Some minority persons are well up the career ladder

Pictured on this page are representative minority group persons* who have carved out successful professional or supervisory Dow careers on their individual merits.

This group of Dow employees are members of an increasingly important and growing part of the Company. Dow believes that the principal contribution it can make in equalizing employment opportunities is to provide an atmosphere in which good performers—regardless of color or national background—have the opportunity to advance and the freedom to contribute to Dow's and their success.

Dow believes that equal opportunity goes much further than numbers. Programs have been and are in progress for all Dow employees so that meaningful careers, recognition of achievement and opportunities for advancement are equally available for every employee.

Dr. Earle B. Barnes, president of Dow Chemical U.S.A. has put it succinctly: "We are interested in making the best use of everyone's talents."

Although the number of Dow employees in the United States declined during 1971, employees from minority groups increased by 199 for a new total of 1,926 or 6.1% of the Company's total U.S. employment.

Unless otherwise noted, they are located in Midland, Michigan



MAINTENANCE FOREMAN
Hurlon J. Clark
Joined Dow in 1964. Supervises 20 people in electrical maintenance service. Texas Division.



PHARMACEUTICAL CHEMIST
Linneaus C. Dorman
PhD in Organic Chemistry, Indiana. Joined Dow in 1960. Specializes in synthesis of peptide compounds for use in pharmaceutical research. Research rank: Senior Research Chemist



SENIOR ENGINEER
Arthur J. Gray
MS in Structural Engineering, Illinois. Joined Dow in 1969. Supervises structural design of chemical plants in Dow Engineering & Construction Services, Houston

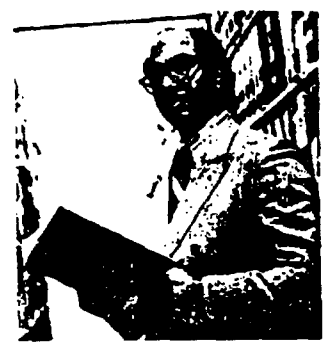
COMPUTER PROGRAMMER
William M. Greene
BS in Electrical Engineering, Tuskegee. Joined Dow in 1965. Designs and supervises execution of computer programs for various Dow departments.



PLACEMENT MANAGER
Ronald S. Haughton
MS in Chemistry, Iowa State. Joined Dow in 1964. Responsible for selection, placement, transfer and personnel records of professional and technical employees for the Midland Division.



PATENT AGENT
S. Preston Jones
BS in Chemistry, Hampton. With Dow since 1968. Specializes in patent procurement and counseling for animal-health products, herbicides and insecticides.





QUARANTINE SUPERVISOR
Edward L. Mathews
Sam's Technical School. Joined Dow in 1952. Unit head of Quarantine Department, Indianapolis Division. Responsible for pharmaceutical after manufacture but prior to release by Dow Quality Control or Food & Drug Administration



RAILROAD FOREMAN
J. D. Spears
Joined Dow in 1968. Supervises employees in cleaning, repairing, switching and inspecting tank vessels for the transport of Texas Division chemicals

Women progress in professional, managerial careers at Dow

More emphasis has been placed on opportunities for women, including better utilization of women in present functions, job enrichment to provide greater work satisfaction; and advancement to jobs of greater responsibility. In February 1972 two outstanding career women were elected assistant officers of the Company. In 1971, women employees numbered 3,366 or 11% of Dow's total U.S. employment. The following page pictures a representative group of professional and supervisory women who have found good career opportunities at Dow.



COST ACCOUNTANT
Carol Ashley
BA in Accounting, Michigan State. Joined Dow in 1967. Responsible for accounting supervision of firms packaging consumer products for Dow.



CONTROL SUPERVISOR
Martha Dean
Bacteriology, Purdue Extension Joined Dow in 1940. Supervisor in Bio Control Department, Indianapolis Division. Supervises laboratory technicians in quality control of biological products.



ORGANIC SYNTHESIST
JoAnn Gilpin
PhD in Organic Chemistry, Northwestern. Joined Dow in 1962. Specializes in synthesis of compounds suitable for use as multifunctional automotive fluids. Research rank: Senior Research Chemist.

COLLOID CHEMIST
Bettye W. Greene
PhD in Physical Chemistry, Wayne State. With Dow since 1965. Conducts fundamental research in colloid and latex chemistry. Research rank: Senior Research Chemist.



TECHNICAL LIBRARY MANAGER
Dolores A. Hartman
MS in Library Science, Michigan. Joined Dow in 1959. Manages Dow's central technical library (staff of 12) and maintains liaison with technical libraries at other Dow locations.



ASSISTANT OFFICER
Lois J. Hoerlein
Joined Dow in 1955. Administrative assistant to the corporate secretary. Elected an assistant secretary of the Company in February 1972.



ANALYTICAL CHEMIST
Lou Alice Howard
BA in Chemistry, Rice. Joined Dow in 1961. Conducts special projects in infrared spectroscopy in the Texas Division. Research rank: Senior Analytical Chemist.



SALARY ADMINISTRATOR
Lorraine Phillips
Northeastern School of Commerce. With Dow since 1959. Sets salary standards for Dow Chemical U.S.A. personnel covered by overtime provisions of wage-hour laws.



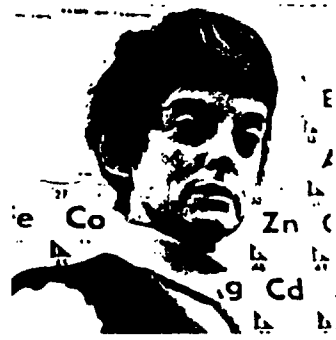
ATTORNEY
Jeraldine B. Smith
JD, Houston (Law). Joined Dow in 1957. Responsible for litigation administration, real estate and equipment leases, legal counselor to Credit and Traffic Departments.



RADIOISOTOPE SPECIALIST
Irene Takahashi
PhD in Chemistry, Washington (Seattle). With Dow since 1958. Applies radiotracers to a variety of problems. Research rank: Senior Research Chemist.



ANALYTICAL MANAGER
June W. Turley
PhD in Chemistry, Pennsylvania State. With Dow since 1957. Responsible for Midland Division Inorganic and Elemental Analysis group.



GENERAL MANAGER'S STAFF
Shirley T. Van Meter
Joined Dow in 1948. Staff assistant to the Texas Division general manager. Handles special assignments, supervises division's guest facilities, coordinates job-opportunities-for-women program.



ASSISTANT OFFICER
Gertrude Welker
Joined Dow in 1952. Secretary to the President. Elected an assistant secretary of the Company in February 1972.



ST0004607

HAVING YOUR CAKE AND EATING IT

Volume chemical production can exist side by side with a clean environment

Some of the comments made during and since Earth Day 1970 have suggested that technology needs to be stopped in its tracks—or even rolled back to the level prevailing in some supposedly more halcyon era—if environmental problems are to be solved.

That the problems exist is manifest. That they can be resolved without suffering the massive dislocations of turning back the clock is becoming more and more apparent.

Dow, which built its first waste-treatment facility (a holding pond) in the Twenties, is successfully abating pollution problems in its operations. By its own evaluation, it is fairly clean now and expects to be a lot cleaner in another two years. Photographs on these pages illustrate the two broad lines of activity—waste treatment (for environmentally safe disposal) and waste prevention (by purifying raw materials and recycling byproducts). The latter method is obviously the more rewarding, as it converts potential wastes into salable products and turns costs into break-even or profit opportunities. Over-all, Dow expects to control pollution at no net cost.

In a project due to be completed in late 1973 in Dow's Texas Division, crude ethylene and propylene will be purified at their manufacturing source, thus eliminating waste problems in "downstream" production. The project also will increase production yields, providing a reasonable return on the $13.8 million investment.

However, Dow doesn't expect every environmental-improvement project to produce a similar result. In some instances, capital costs are going to be increased substantially without an offsetting gain in return; then, the utility of the product will have to justify the resulting higher selling prices or the plant cannot be built at all.

Sometimes not even the most rigorous efforts can bring an older plant up to the desired standard. Such is the case with the mercury-cell chlorine/caustic facility of Dow Chemical of Canada, Limited, at Sarnia, Ontario. Although mercury losses to the St. Clair River have been cut to less than a tablespoon per day, well within government requirements, Dow's goal of total elimination appears impossible with the mercury-cell process. It therefore will be replaced with a facility based on the diaphragm type of cell, which uses no mercury.

Control of air pollution, particularly from power-house stacks, offers mixed opportunities. More and more coal-fired boilers are being converted to low-sulfur oils or natural gas at Dow's plants in Midland and Ludington, Michigan. But even cleaner, as well as more economical, is nuclear power, which is why Dow's Midland complex has contracted to purchase all of its requirements for electric power and steam from the projected Consumers Power Company Midland nuclear plant.

Challenge and exhortation up and down the line can work wonders. An example is a contest among 14 Dow synthetic latex plants around the world to determine which one could increase its average yield the most over a five-year period. The results: yields were increased from an original high of 94% to a remarkable 98% while simultaneously wastes were reduced by 70%.

Recent events have wrought many changes in Dow's methods of operating plants and doing business. Supervisors now are rated for environmental performance, along with traditional factors. And suffusing the entire effort is the basic philosophy that the "environmental imperative" is a positive opportunity, not a negative burden. Many solutions devised by Dow to solve its own pollution problems not only reduce internal costs but can be marketed to others. Dow Environmental Control Systems is a substantial business contributing to operating income. With the irreversible push for a cleaner world, it can only be a growth business.

WASTE TREATMENT IS EFFECTIVE . . . .

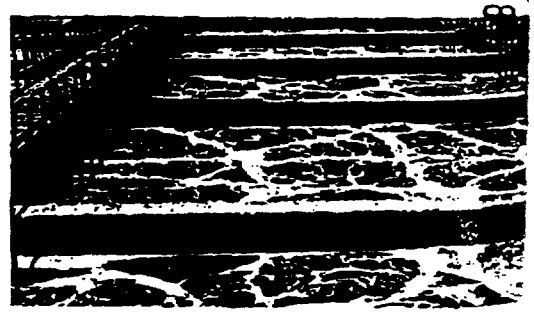
Cooling towers in Dow's Midland, Michigan, complex reuse water for cooling purposes over and over, reducing plant's fresh-water requirements and amount of heated water returned to Tittabawassee River. Current $7.2 million project will add 28 towers, for a new total of 39.



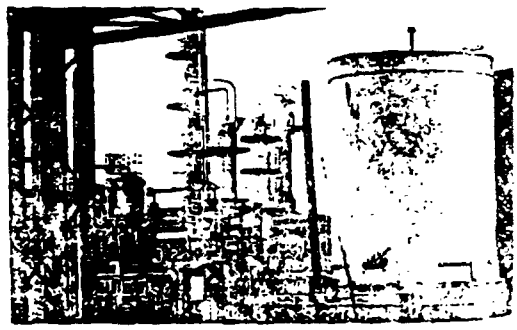
Settling ponds remove undissolved solids and light floating materials from phenolic wastes. Next rock **trickling filters** (background) convert about 95% of the phenol to carbon dioxide and water.



Aeration basins further treat phenolic wastes (to knock down the remaining 5%) as well as other organics.



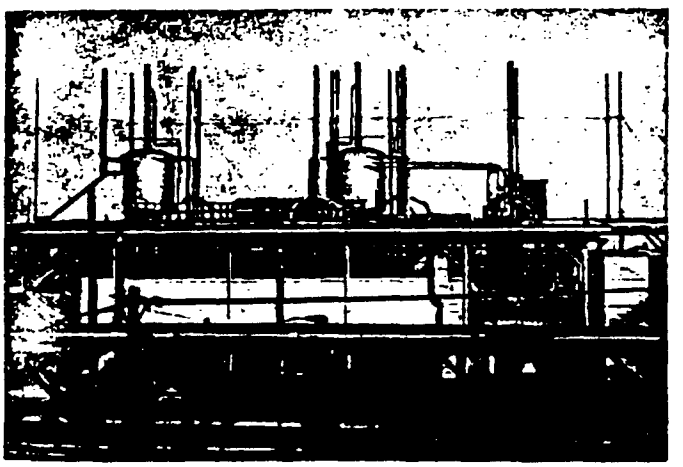
Trickling filter tower containing *Surfpac* plastic biological oxidation media (in Dow's Bay City, Michigan, petrochemical plant) performs same function as rock trickling filter but requires less land area.



Holding ponds are additional safeguards against pollution accidents. This one (capacity: one million gallons) in Midland complex keeps effluent streams from emptying into river when contaminants in outflow trip a monitor, shutting a control gate.



Scrubbers and filters control air pollution. These vent stacks atop a manufacturing plant are among 4,522 in Midland complex, all of which have been checked for air-pollution potentials and equipped with control devices as needed.



Ecology vans, manned around the clock, seven days a week, by four environmental quality control specialists, prowl the Midland complex looking for trouble spots. Job includes taking periodic samples of river water.

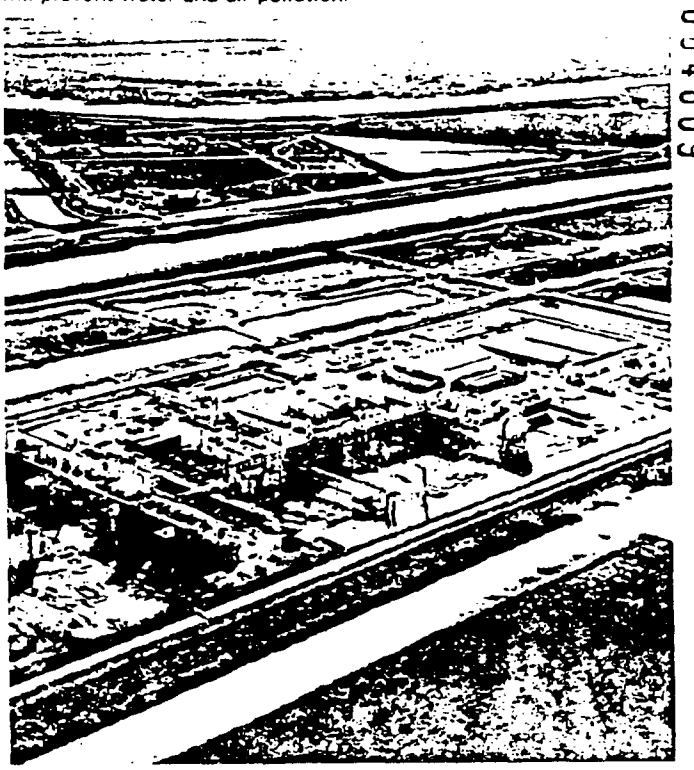


BUT THE REAL SOLUTION IS WASTE PREVENTION

Dow synthetic latex plant near Dalton, Georgia, uses more than a million gallons of water per day and recycles practically all of it. Coagulated latex particles settle out in one of four primary ponds (foreground). Clarified water then flows to a large reservoir (background), from which it is pumped back into the plant



When this new chlorine facility in the Texas Division begins full production, several new systems, including a recycling process, will prevent water and air pollution.



ST0004609

From Sig. Pagani's vacation 'souvenir' came

THE LITTLE BUGS OF DR. SENSI

In 1971 Hermes Pagani reenacts the collection of the now famous St. Raphael soil sample of 1957 in a pine forest on the French Riviera. Sample contained the microorganisms from which *Rifadin* antibiotic was derived.



In the Lepetit Research Laboratories in Milano the St. Raphael sample is prepared for screening along with others from around the world. Total of 2,000 were processed.

When incubated in a growth medium, microorganisms in soils produce micro colonies which are examined for metabolites (waste products) that are toxic to other organisms such as the tuberculosis bacillus.

Lepetit research director Dr. Piero Sensi has directed the overall rifampin program, now in its 20th year, particularly the large program of chemical modification and derivatives development.

Agar dishes containing with metabolic substances extracted from micro are checked under a light source to determine extent of antibiotic activity.

Metabolites with significant activity are reproduced in large quantities for purification and further study. Through chemical modification one microorganism in the St. Raphael sample eventually resulted in "rifamycin" (rifampin) shown here in crude form.

00046161



It was a happy holiday, there in St. Raphael, midway between St Tropez (the town Brigitte Bardot made famous) and elegant Cannes. Still, relaxed in the Riviera splendor of 1957, Hermes Pagani was ever the team man. Before turning homeward to Milano, he thoughtfully, on his own initiative, dug up a few square inches of French soil and put them in a pill bottle. The bottle proved to be loaded with a kind of gold.

Signor Pagani is a microbiologist with Lepetit Research Laboratories* under Professor Piero Sensi. Back in his laboratory, where he is in charge of fermenting antibiotic cultures, he was soon to see his soil sample again. Now inserted into Lepetit's soil-screening program, it joined some 2,000 other samples submitted by Lepetit affiliates around the world and examined during a five-year period starting in 1952.

Ever since the early days of penicillin, pharmaceutical companies have been sorting out some of the millions of microorganisms contained in soils, looking for new anti-bacterial agents. In general, their search has been addressed to such types as the *Streptomycetes*, which have proved capable of producing antibiotics. Of the 18,000 *Streptomycetes* strains isolated by the Lepetit researchers, only 400 were adjudged worthy of further investigation. The most promising, *Streptomycetes mediterranei*, was found in the soil from Sig. Pagani's pill bottle. A happy holiday indeed!

During normal growth, the strain produces a mixture of five antibiotics Realizing it had in hand a whole new antibiotic group, Lepetit researchers assigned them the generic name of rifamycin. During the next five years, it was established that only one, rifamycin B, could be purified. As it turned out, rifamycin B itself is inactive against bacteria, but as it degrades spontaneously in watery solutions it produces a very active product, which was given the name rifamycin SV.

In clinical research, SV was active against bacterial infections, especially those leading to pulmonary tuberculosis. The trouble was that it could be administered only by injection, and it had a restricted distribution within the body. At this point, Professor Sensi and his staff embarked on a large program of chemical modification, lasting three years, to find a derivative that could be taken orally and achieve a better distribution. Of more than 500 derivatives synthesized and tested, one was found that met these goals. Given the names rifampicin and rifampin, it also exceeded the parent substance in activity.

In extensive clinical trials in many countries, rifampin demonstrated excellent results in treating pulmonary tuberculosis, in combination with other anti-tuberculous drugs. Medication programs with rifampin are actually lifesaving, particularly in cases where the disease has become resistant to other treatment. Another potential advantage is a saving in patient hospital costs.

Under the trademark *Rifadin*, rifampin first became generally available to physicians in parts of Europe and Latin America in 1968 Since then, its use has spread to all parts of the world. During 1971, it was registered in the United States.

Indications are that the trail leading from St. Raphael is far from ended. Medical researchers are studying rifampin derivatives for their effect on viral diseases, leukemia, sarcoma, trachoma and leprosy. Chemists at Lepetit under Dr. Sensi's direction are hard at work synthesizing new derivatives It could be that the rifampin story is only beginning. Sig. Pagani's happy holiday may turn out to have been happier still.

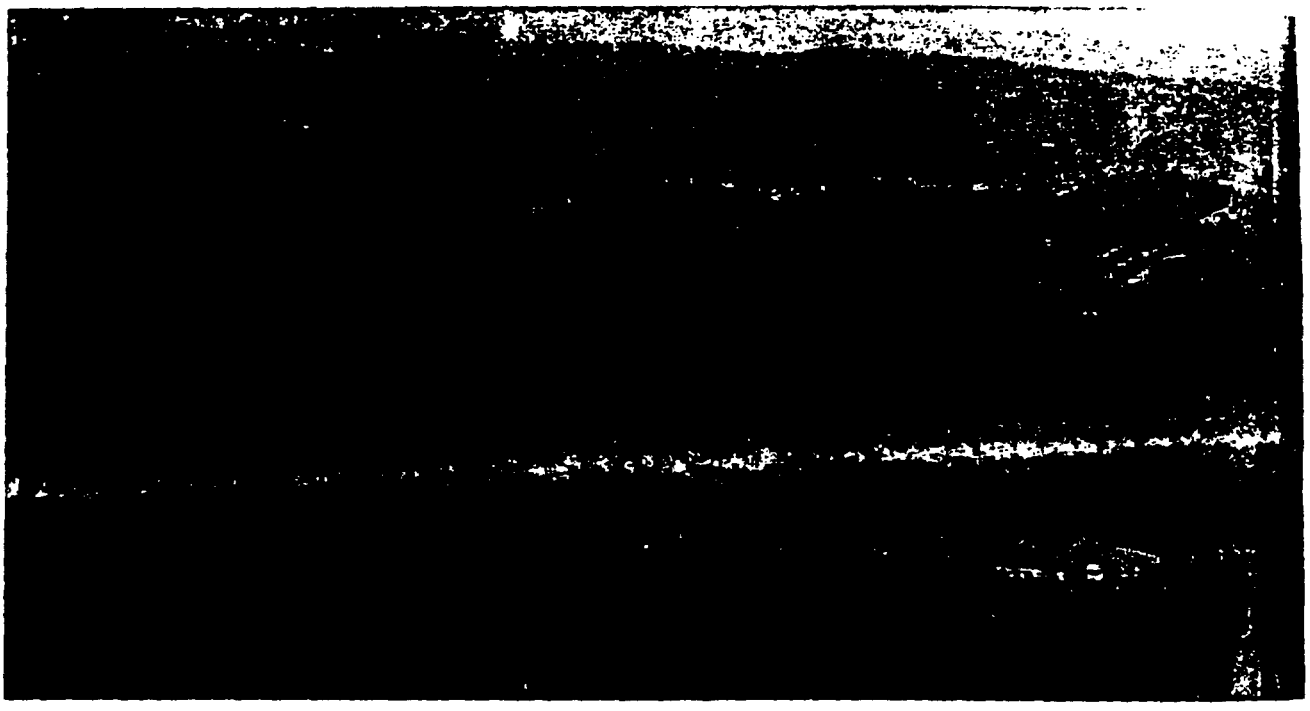
*The Laboratories are a part of Lepetit S.p.A., one of Italy's largest pharmaceutical manufacturers and a member of Dow's Life Sciences Department

ST0004611

INSECTICIDES WITH A DEFTER TOUCH

Two Dow products move in where DDT no longer treads

By the dawn's early light, when the air is still, a U.S. Forest Service plane sprays *Zectran* insecticide on budworm infested spruce in Idaho's Nez Perce Forest. Only a sixth of a pound per acre of *Zectran* was required to check the budworm epidemic, avoiding undue damage to the insect's natural enemies. Vapor plumes are largely deodorized kerosene, used as a carrier for the insecticide.



From the moment of its hopeful introduction in 1943, DDT seemed to have everything going for it. It was not only effective against a multitude of troublesome insect species but cheap, too, so that even poorer nations could afford it. Among the factors that made it cheap was its persistence; one or two applications might be effective against the *Anopheles* mosquito, the gypsy moth, or some other disease carrying or crop destroying insect for an entire year. Farmers and public health officers turned to DDT to solve a myriad of problems, and production soared, bringing the economies of large-scale manufacture.

But, as every reader of periodicals knows, some of the very qualities that made DDT a success during World War II and the 20 year aftermath have led to its decline in this age of environmentalism. In 1971, the World Health Organization reported that during the previous seven years DDT use had dropped 50% (to 250,000 tons annually) because of environmental fears.

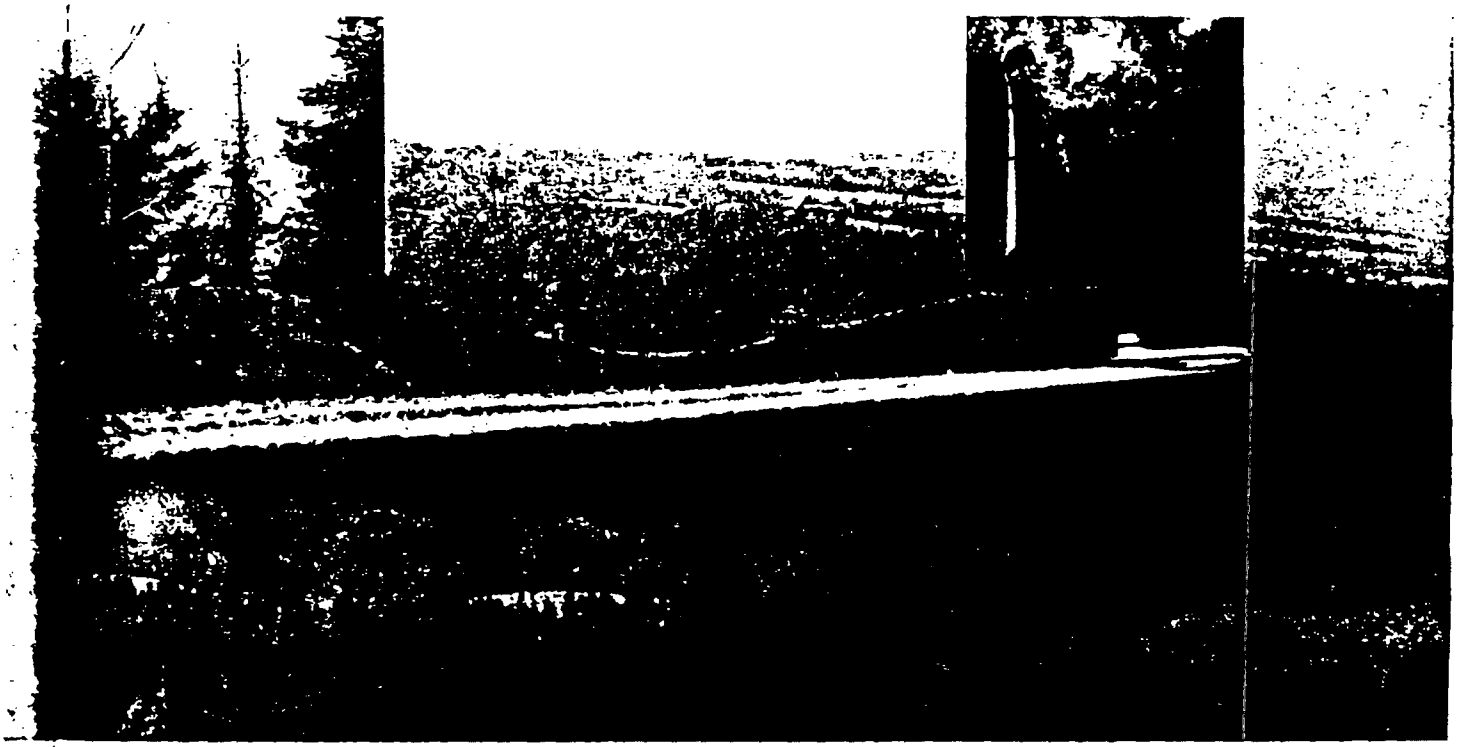
Dow has introduced two products that replace DDT in certain uses—*Zectran* insecticide for control of the spruce budworm (one of the most devastating of forest pests) and *Dursban* insecticide for the control of mosquito larvae and such household nuisances as cockroaches.

Zectran, originally introduced as a lawn and garden product, was off the market for several years because of manufacturing problems, which have now been solved. In 1971, following seven years of tests by the United States Forest Service, the product was cleared for spruce budworm control by the Environmental Protection Agency. The Forest Service characterized the event as "a giant step toward finding a highly selective

ST0004912

Budworms defoliated this spruce in Aroostook County, Maine, another area where *Zectran* is teaming with Nature to preserve forest values. Estimated 5.7 million acres of U.S. forests have been noticeably damaged by these voracious insects

Prior to spraying, Forest Service personnel clip midcrown samples from outer 15 inches of trees. Samples were identified, bagged and sent to field laboratory for spruce-budworm counts.



chemical that is a safe substitute for DDT in controlling one of the major forest marauders without damage to the environment."

During the summer of 1971, the Forest Service used *Zectran* against the spruce budworm in the Pacific Northwest and in Maine in what entomologists call "integrated contro programs." These require maximum use of a harmful insect's natural predators and parasitic enemies. In the areas selected for treatment, the budworm had been epidemic for five years

Before the spraying, entomologists made actual counts of budworm populations from tips of branches cut from selected trees. The objective was to determine as closely as possible the time for optimum control of the insects. Information from the sampling was coordinated with special weather forecasts. *Zectran*, which is 20 to 25 times more powerful against the budworm than DDT, was sprayed aerially at the rate of 15 one-hundredths of a pound per acre. At this exceedingly low rate, the insecticide was highly selective, killing many budworms (complete kill was not the objective) but preserving desirable insect life to a high degree.

Prior to the 1971 sprayings, studies had demonstrated that *Zectran* does not accumulate in the outdoor environment, in water or in animal tissues and is nonhazardous to birds, fish and mammals.

Dursban insecticide has a similar propensity for rapid decomposition – an environmental advantage in mosquito control work. Because of their shorter active lives, both insecticides need to be applied somewhat more often than DDT to keep a pest under control. This "environmental cost" appears to be one that the United States and many other countries are willing to pay.

ST0094613

TARGET FOR TONIGHT

After years of planning and building a chemical plant comes the time for pay-off

"I can't think of any reason not to do it now." It was December 16, 1971, and Robert L. Walzel, Unit III manager of Dow's Oyster Creek Division, had just made one of the most important decisions of his Dow career. For "doing it now" meant triggering a chain of events that would:

- Bring the world's largest phenol plant (400 million pounds per year capacity) on stream.
- Make Dow the world's largest phenol producer.
- Put Dow in the acetone business in a big way since 240 million pounds per year of this popular solvent would be generated as a co-product of the phenol-making process.

Phenol is a major industrial chemical consumed in enormous quantities in making such products as phenol-formaldehyde plastic resins, weed killers, adhesives and aspirin. Dow pioneered a phenol process based on chlorbenzol, hydrochloric acid and caustic soda in 1922. The new plant, however, was designed for a process Dow had never used before—the oxidation of cumene, a basic building-block chemical.

Unit III, built at a cost of more than $20 million, sprawls over an area equivalent to six square city blocks on the Gulf near Freeport, Texas. It is a huge collection of columns, towers, tanks and piping—a giant amid giants (Oyster Creek Unit I is one of the world's largest vinyl chloride plants and Unit II is one of the world's largest chlorine-caustic facilities). More than three years of planning, designing, construction, testing and adjusting had been required to bring Unit III to its present state.

Although a modern chemical plant is designed for continuous operation, startup involves more than pushing a button at one end and immediately drawing off finished product from the other. The miles of piping must be filled, raw materials brought up to the proper temperature and pressure and then reacted, semi-finished product purified. The cumene oxidation process for phenol, while requiring only two chemical reactions, actually encompasses five different steps.

Starting up a chemical plant is no ordinary event, and the 52-man crew that started up Unit III was no ordinary crew. Aside from 12 production veterans transferred from Dow's Texas Division (a few miles away) and Units I and II, they were comparable to Navy "boots" fresh out of boot camp. Former teachers, students, returning Vietnam veterans, factory workers and ranch hands, they had not seen the inside of a chemical plant prior to the previous summer. But after six months of classroom and on-the-job training, they were confident and enthusiastic, a tribute to the Oyster Creek Division's "people philosophy."

The division feels that people have to get satisfaction out of their work and that one way to do this is to give them as much responsibility as they can handle.

For men craving responsibility, starting up Unit III was a kingsized opportunity. The situation truly called for individuals who could think for themselves and solve problems never before encountered. Despite months of preparation, none of a new chemical plant's equipment or controls has been tested in production-scale operation. The crew is uncertain how the various instruments will react to harness the high temperatures and pressures and huge volumes associated with the process. It's something like piloting a newly developed aircraft to get the feel of how it controls, accelerates and maneuvers under different conditions.

When the unit started up, each step in the reaction progressed "as planned." The critical event was actually anti-climactic. The long months of designing, computing, experimenting and training had paid off. It was now December 18, approximately 48 hours from startup.

After the plant had run continuously for more than a day, Walzel was satisfied that it was operable. He then ordered operations shut down for a routine debugging of units that are best serviced with the plant "off stream." With the debugging completed, the plant was again brought on stream. The veterans and the boots (not really boots any longer) settled down to the job of continuously operating, maintaining and improving the world's largest phenol plant.







1. Just prior to startup, Oyster Creek Division general manager Louis Shelton and Unit III manager Robert Walzel inspect the vast phenol facility.

2. Intense concentration and activity build up in the control room as the plant comes on stream. The room is the facility's nerve center from which all steps of the production process are controlled.

3. Highly reactive cumene hydroperoxide is concentrated in this tank just prior to being "split" into phenol and acetone.

4. Technical supervisor Ken Huff makes a fine-tune adjustment to one of the controls as a massive chemical reaction takes place in equipment far removed.

5. Training supervisor Linton Lipscomb makes a routine check of emergency breathing equipment. Personal safety practices and protective equipment have a high priority in Unit III's operations.

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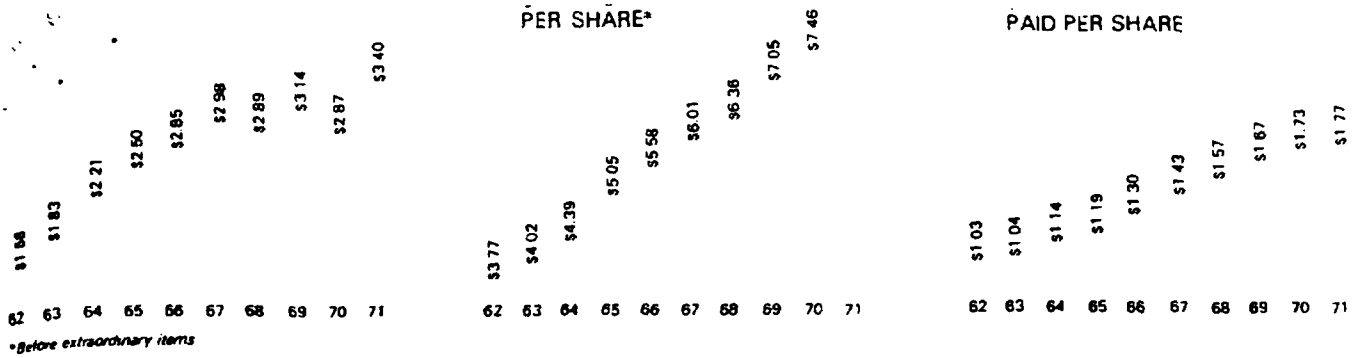
CONSOLIDATED BALANCE SHEET
The Dow Chemical Company and Subsidiary Companies

	December 31 1971	December 31 1970 (Restated – Note A)
ASSETS		
Current Assets		
Cash	$ 40,501,724	$ 30,280,740
Marketable securities and interest-bearing deposits (at cost – approximately market)	65,612,213	48,362,673
Accounts and notes receivable:		
Trade, less allowance for doubtful accounts (1971, $10,749,008; 1970, $11,470,611)	368,435,898	349,640,162
Miscellaneous	125,829,174	88,968,486
Deferred income taxes	10,091,608	6,361,063
Inventories – at lower of cost or market:		
Finished and in process	279,732,535	256,734,955
Materials and supplies	115,727,122	111,504,818
	1,005,930,274	891,852,897
Investments		
Capital stock – at cost plus equity in accumulated earnings (less reserves – 1971, $1,508,662; 1970, $2,842,100) (Note B):		
Wholly owned Swiss bank	38,655,829	31,819,987
Associated companies (50% owned)	177,489,543	149,220,495
Other	30,984,228	31,919,217
Sundry – at cost (less reserves – 1971, $1,947,736; 1970, $2,742,904)	50,917,952	49,830,019
Noncurrent receivables (less reserves – 1971, $2,313,328; 1970, $2,300,000)	88,302,329	104,098,219
	386,349,881	366,887,937
Plant Properties (Note D)		
Cost	2,722,899,183	2,524,312,720
Less – Accumulated depreciation	1,158,792,049	1,086,124,485
	1,564,107,134	1,438,188,235
Goodwill (Note E)	77,323,480	72,195,649
Deferred Charges and Other Assets	45,096,622	35,653,499
TOTAL	$3,078,807,391	$2,804,778,217

See Accounting Principles and Notes to Financial Statements



*Before extraordinary items

	December 31	
	1971	1970 (Restated—Note A)
LIABILITIES		
Current Liabilities		
Notes payable	$ 368,264,346	$ 229,255,553
Long-term debt due within one year	35,180,686	61,980,998
Accounts payable	180,513,967	150,566,715
United States and foreign taxes on income	56,431,754	56,770,254
Accrued and other current liabilities	151,118,123	138,082,808
	791,508,876	636,656,328
Long-Term Debt (Note F)	1,010,136,133	969,844,553
Other Liabilities and Reserves		
Minority interests in subsidiary companies	34,665,997	39,932,009
Deferred employee benefits	26,262,248	19,168,418
Deferred investment grants	8,248,031	1,885,000
Deferred income taxes	5,950,490	4,764,558
Loss on foreign investments	5,000,000	5,000,000
	80,126,766	70,749,985
Stockholders' Equity (Note G)		
Common stock (1971—issued, 47,819,034 shares)	239,095,170	158,089,120
Capital surplus	520,935,018	585,046,077
Retained earnings	553,448,631	479,779,007
	1,313,478,819	1,222,914,204
Less—Treasury stock at cost (1971—2,443,210 shares)	116,443,203	95,386,853
	1,197,035,616	1,127,527,351
TOTAL	$3,078,807,391	$2,804,778,217

See Accounting Principles and Notes to Financial Statements

ST0004617

CONSOLIDATED STATEMENT OF INCOME
The Dow Chemical Company and Subsidiary Companies

	Year Ended December 31	
	1971	1970 (Restated—Note A)
Products and Services		
Net sales	$2,052,711,344	$1,911,105,081
Operating costs and expenses:		
Cost of sales	1,517,253,844	1,417,767,015
Selling and administrative	250,706,483	233,714,252
	1,767,960,327	1,651,481,267
Products and services operating income	284,751,017	259,623,814
Non-Products and Services		
Investment and financial:		
Profit on investment turnover	4,442,979	10,658,493
Income from sundry investments	3,052,359	3,236,274
Equity in earnings of Swiss banking subsidiary	2,777,853	2,331,584
Administrative expenses	(1,767,840)	(1,974,248)
	8,505,351	14,252,103
Equity in earnings of associated companies and minority investments exceeding 20% (Note B)	18,923,896	6,847,019
Interest expense—net	(78,516,402)	(73,521,590)
Sundry income—net	16,456,403	14,850,983
Non-products and services income (loss)	(34,630,752)	(37,571,485)
Income Before Provision for Taxes on Income	250,120,265	222,052,329
Provision for Taxes on Income (Note J)	91,000,000	88,100,000
Income Before Minority Interests	159,120,265	133,952,329
Minority Interests' Share in Income	4,726,824	3,977,670
Income Before Extraordinary Items	154,393,441	129,974,659
Extraordinary Items—Net of Tax (Note C)	335,688	(27,831,557)
Net Income	$ 154,729,129	$ 102,143,102
Earnings per Share		
Income before extraordinary items	$3.40	$2.87
Extraordinary items—net of tax	.01	(.61)
Net income	$3.41	$2.26

See Accounting Principles and Notes to Financial Statements

CONSOLIDATED STATEMENT OF CAPITAL SURPLUS
The Dow Chemical Company and Subsidiary Companies

	Year Ended December 31	
	1971	1970
Balance at Beginning of the Year	$585,046,077	$574,699,429
Add:		
Excess of selling or market price over par value of common stock issued to employees	15,189,085	10,671,487
Excess of face value of debentures over par value of common stock issued on conversion	313,951	86,145
	600,549,113	585,457,061
Deduct:		
Retirement of treasury shares and transactions related to acquisition of subsidiaries		410,984
Transfer to common stock relative to three-for-two stock split	79,614,095	
Balance at End of the Year	$520,935,018	$585,046,077

CONSOLIDATED STATEMENT OF RETAINED EARNINGS
The Dow Chemical Company and Subsidiary Companies

	Year Ended December 31	
	1971	1970
Balance at Beginning of the Year (as previously reported)	$454,802,305	$430,696,301
Add – Equity in undistributed earnings since dates of acquisition of associated companies and minority investments exceeding 20%	24,976,702	26,220,767
Balance at Beginning of the Year (as adjusted)	479,779,007	456,917,068
Add (Deduct):		
Net income for the year	154,729,129	102,143,102
Adjustments related to consolidation of subsidiaries	(31,943)	188,308
	634,476,193	559,248,478
Deduct:		
Cash dividends	81,027,562	78,499,230
Retirement of treasury shares		970,241
Balance at End of the Year	$553,448,631	$479,779,007

See Accounting Principles and Notes to Financial Statements

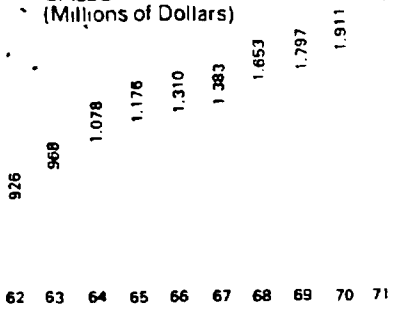
OPINION OF INDEPENDENT PUBLIC ACCOUNTANTS

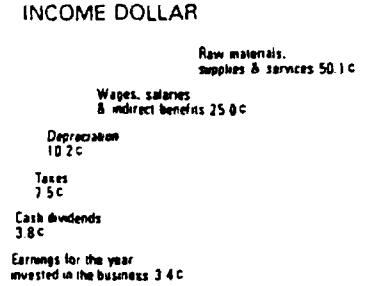
THE DOW CHEMICAL COMPANY

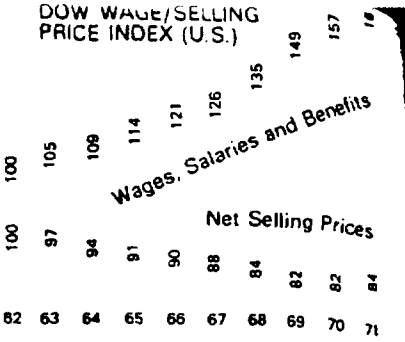
We have examined the consolidated balance sheet of The Dow Chemical Company and its subsidiary companies as of December 31, 1971 and the related consolidated statements of income, retained earnings, capital surplus, and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements present fairly the financial position of the companies at December 31, 1971 and the results of their operations and the changes in their financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year, as restated, as explained in Notes A and B to the financial statements.

Detroit, Michigan, February 23, 1972







CONSOLIDATED STATEMENT OF CHANGES IN FINANCIAL POSITION
The Dow Chemical Company and Subsidiary Companies

	Year Ended December 31 (In thousands) 1971	1970 (Restated—Note A)
Source of Working Capital		
Net income before extraordinary items	$ 154,393	$ 129,975
Charges (credits) to income not involving working capital:		
Depreciation	218,755	207,744
Equity in income—non-consolidated companies, less dividends received	(14,611)	(1,051)
Minority interest in income	4,727	3,978
Other—net	11,954	11,216
Proceeds from sale of investments, less gains reflected in net income	10,406	13,094
Provided from operations	385,624	364,956
Extraordinary items	9,317	17,131
Issuance of debentures	26,000	274,000
Sale of common stock to employees	16,538	10,258
Increase in other liabilities and reserves	8,263	4,750
Disposal of plant property and sundry	5,312	4,898
	451,054	675,993
Use of Working Capital		
New plant and equipment	364,600	348,099
Cash dividends	81,028	78,499
Purchase of treasury stock	21,056	15,969
Decrease (increase) in revolving credit and other long-term debt	(11,482)	108,074
Noncurrent investments	10,736	22,157
Increase in deferred charges and other outlays	10,955	4,660
Acquisitions of subsidiaries and purchase of minority interests:		
Working capital	155	2,178
Goodwill	5,127	9,456
Minority interests	9,988	
Other—net	(334)	3,699
	491,829	592,791
Increase (Decrease) in Working Capital	$ (40,775)	$ 83,202
Increase (Decrease) in Current Assets		
Cash and marketable securities	$ 27,471	$ (54,769)
Receivables	55,656	12,531
Deferred taxes	3,730	2,442
Inventories	27,220	79,171
Decrease (Increase) in Current Liabilities		
Notes payable and current portion of long-term debt	(112,208)	63,130
Accounts payable	(29,948)	(10,021)
Income taxes and accruals	(12,696)	(9,282)
Increase (Decrease) in Working Capital	$ (40,775)	$ 83,202

See Accounting Principles and Notes to Financial Statements

ST00046220

ACCOUNTING PRINCIPLES

Consolidation The assets, liabilities, revenues and expenses of all significant subsidiaries, except for a wholly owned Swiss bank, are included in the accompanying consolidated financial statements. Because of the nature of its operations, the accounts of the Bank are not consolidated. However, its earnings are included in consolidated net income currently under the equity method of accounting.

Commencing in 1971, the Company adopted the practice of carrying on the equity basis its investments in companies which are 20%-50% owned. This means that the investments are adjusted to reflect Dow's share of the companies' earnings or losses which are included in consolidated net income. Dividends received are treated as a reduction of the investment. The cumulative equity in net income of such companies to January 1, 1971 was recorded as a credit to retained earnings. The effect of the change is shown in Note B

Other investments are stated at cost less applicable reserves.

Translation of Foreign Currencies Property in foreign countries is translated into United States dollars at the exchange rates which prevailed at the dates the assets were acquired. All other assets and liabilities are translated generally at current rates of exchange. Revenues and expenses are translated at the average exchange rates for the year, except that depreciation expense is adjusted to reflect the historical rate. Wherever available, the parities established by the International Monetary Fund are used as the current rate. All translation gains or losses attributable to currencies of developing countries (principally Latin America) are credited or charged to income currently. In developed countries, gains or losses relating to the translation of long-term debt are deferred over the life of the debt; the amount deferred is adjusted for net losses or gains arising from the translation of assets and other liabilities.

Inventories Finished materials and work in process are stated at standard costs, which approximate the current production costs, or market if that is lower. Raw materials and supplies are stated at cost.

Plant Properties and Depreciation Depreciation is computed over the estimated service lives of depreciable assets using the declining balance method in the United States and Canada. In other countries, the straight line method is generally used.

Expenditures for renewals and betterments are capitalized, and maintenance and repairs have been charged to income.

Generally, assets that are fully depreciated are eliminated from property and the reserve for depreciation at the end of each year, although the property may be still in use. In the case of disposals, the assets and related reserves are removed from the accounts and the net amount, less proceeds from disposal, is charged or credited to income.

Goodwill The excess of the cost of investments in consolidated subsidiaries over equity in their net assets at dates of acquisition is carried as goodwill. Any goodwill arising after October 31, 1970 is amortized over 40 years. Goodwill arising prior to that date is related to investments which, in the opinion of management, have appreciated in value, and no amortization is being provided.

Retirement Plans The Company and certain subsidiaries have plans to provide retirement benefits for eligible employees. The policy is to accrue and fund pension cost as computed by an actuary.

Investment Turnover The profit or loss resulting from the disposal of assets held for investment and resale is segregated in the statement of income as investment turnover.

Taxes on Income and Investment Credits The companies compute and record income taxes currently payable based upon their determination of taxable income which may be different from pretax accounting income. These differences may arise from recording in pretax accounting income transactions which enter into the determination of taxable income in another period. The tax effect of these timing differences is recognized by adjustment currently to the provision for taxes.

No provision has been made for income taxes on the unremitted earnings of subsidiary companies, except as required under United States income tax laws. Either these earnings are considered to be permanently invested or the applicable tax would not be material.

Laws governing the determination of United States and certain foreign income taxes provide for investment credits or allowances which are deductible generally upon completion of qualified facilities. Such credits are reflected as a reduction of income tax expense on the flow-through basis in the year in which they are deductible.

In addition to tax credits, certain foreign countries provide investment incentives in the form of tax-free grants which offset development and startup expenses of new facilities to which they relate. Excess, if any, of grants earned over expenses incurred will be amortized over the life of the facilities.

Research and Development All research and development costs are charged to income as incurred

NOTES TO FINANCIAL STATEMENTS

A. Restatement of Prior Years The financial statements as published for 1970 have been restated to give effect to the change in 1971 to the equity method of accounting for investments.

Earnings per share have been restated also to recognize the three-for-two stock split as of July 1, 1971.

Certain other items for 1970 have been reclassified for comparative purposes to conform to 1971 presentation.

B. Equity in Earnings of Associated and Other Companies The effect on income of the change to the equity method of accounting for investments, as described in Accounting Principles, for 1971 and 1970 is shown below:

	(In millions) 1971	1970
Equity in income (loss):		
Associated companies (50% owned)	$18.8	$ 8.5
Ownership exceeding 20% but less than 50%	.1	(1.7)
	18.9	6.8
Less:		
Dividends received	7.7	8.1
Intercompany profit		1.0
Net increase (decrease) in income before extraordinary items	$11.2	$(2.3)
Per share	$ .25	$(.05)

As a result of the change to the equity method of accounting, retained earnings was credited with $24,976,702 which at December 31, 1970 represented equity in the undistributed net income since dates of acquisition of 20%-50% owned companies. The carrying value of the investments in such companies approximates the Company's equity in their net assets.

C. Extraordinary Items A summary of significant extraordinary items of income and expense, net of the related income tax is shown below:

	(In millions) 1971	1970
Gain on disposition of subsidiary and associated companies	$ 5.7	$ 2.2
Gain (loss) on Phrix-Werke A.G. investment	2.5	(31.1)
Plants and projects abandoned	(9.7)	
Equity in extraordinary items of 20%-50% owned companies—net	3.4	1.1
Other	(1.6)	
Net income (expense), after tax	$ .3	$(27.8)

The Company sold its investment in the capital stock of a small subsidiary in December 1971 at a profit of $7,815,196 before income tax reduction of $2,113,482.

In 1970, the investment in Phrix was considered worthless and income was charged with $31,073,000 representing the full cost, less estimated income tax reduction of $12,294,000. The Company sold all shares of this stock in 1971 for $3,665,521 which resulted in a profit of $2,529,210 after income tax provision.

During 1971, the Company announced a program for phasing out its present chlor-alkali facility in Sarnia, Ontario and replacing it with a process which does not use mercury. Accordingly, income for 1971 was charged with $9,008,600 representing the cost of the plant, less related income tax reduction of $4,670,238. Several incomplete capital projects which were abandoned during the year account for the remainder of the 1971 loss.

D. Plant Properties Properties and accumulated depreciation at December 31, 1971 were:

Classifications	(In thousands) Cost	Accumulated Depreciation
Land	$ 52,848	
Land & waterway improvements	58,907	$ 24,672
Buildings	297,982	128,634
Machinery & other equipment	1,884,504	956,880
Wells & brine systems	37,829	22,538
Furniture & fixtures	27,977	15,270
Other	20,271	10,798
Construction in progress	342,581	
Total	$2,722,899	$1,158,792

E. Goodwill The amortization of goodwill acquired after October 31, 1970, as required by recently promulgated accounting rules, was not material in 1971. There was no amortization provided in 1970.

F. Long-Term Debt and Available Credit Facilities Details of long-term debt were:

	(In thousands) December 31 1971	1970
Promissory notes:		
4.5%, final maturity 1990	$ 110,000	$115,000
5.0%, final maturity 1991	92,000	96,000
Debentures:		
4.35%, final maturity 1988	75,928	79,010
6.70%, final maturity 1998	100,000	100,000
7.75%, final maturity 1999	100,000	100,000
8.675%, final maturity 2000	150,000	142,000
8.90%, final maturity 2000	150,000	132,000
Debentures, subordinate convertible, 3% due 1982 (1971—22,324 common shares reserved)	728	1,085
Note payable under revolving credit agreement, due 1975 (total available facilities $110,000,000)*	30,000	40,000
Other (various rates and maturities):		
Foreign currency loans	149,816	117,769
Dollar loans	51,664	46,981
Total	$1,010,136	$969,845

* In addition to the $80 million of unused credit under this agreement, there is an additional $225 million of credit available under a revolving credit agreement with United States banks. The Company also had a 1.0 billion Deutsche mark agreement with a group of major German banks which is exercisable through 1974.

The promissory notes and debentures are payable generally in annual installments.

Installments (stated in millions) due on long-term debt in the five years after 1971 are: 1972, $35.2; 1973, $38.7; 1974, $45.0; 1975, $76.5; 1976, $41.1.

G. Stockholders' Equity At December 31, 1971, authorized capital stock consisted of 100,000,000 common shares and 25,000,000 preferred shares of $5 par and $1 par per share, respectively.

The changes in the number and amount of issued shares of common stock during 1971 were:

	Shares	Amount
Issued January 1	31,617,824	$158,089,120
Adjustments to reflect three-for-two stock split	15,808,913	79,044,565
Sold to employees	381,349	1,906,745
Conversion of debentures	10,948	54,740
Issued December 31	47,819,034	$239,095,170

At December 31, 1971, there were 45,375,824 shares of common stock outstanding, after deducting 2,443,210 shares of treasury stock. No preferred shares have been issued.

The stockholders previously authorized plans for granting options to purchase common stock at the fair market value at the date of grant to officers and key employees. The options must be exercised within five years from the date of issuance. Changes during 1971 in the number of shares under option were:

	1967 Option Plan	1964 Incentive Plan	Dividend Units*
Options (adjusted for three-for-two stock split July 1, 1971).			
Outstanding January 1	493,121	100,125	92,130
Granted	86,827		4,500
Exercised	64,191	69,930	
Expired or terminated	867	22,695	3,750
Outstanding December 31	514,890	7,500	92,880
Not optioned December 31	20,919		282,120
Price range on outstanding options at December 31	$40.96 to 67.29	$40.00 to 50.83	

*A dividend unit is the right to receive for a specified period cash payments equivalent in value to cash dividends paid during such period on one share of common stock.

The Company's Award Plan permits the granting, during the ten-year period ending May 1979, of 525,000 shares of Restricted or Deferred Stock, or a combination thereof, to selected employees in lieu of cash for services. During 1971, 735 shares of Deferred Stock were awarded; no Restricted Stock was issued. At December 31, 1971, there were 468,230 shares available for grant. The Plan also extended to May 1979 the previous authority for granting dividend units.

In May 1971, the Company made an offering of common stock to its employees at $57.00 a share, payable generally through payroll deductions. At December 31, 1971, there were unfilled subscriptions for 194,015 shares which may be cancelled at the option of the employee. Partial payments on these subscriptions aggregating $7,030,000 are included in current liabilities.

In computing earnings per share, no adjustment was made for common shares issuable under stock purchase and option plans or upon conversion of 3% debentures because there would be no material dilutive effect.

H. Foreign Exchange In 1971, pre-tax income was charged $5,376,706 representing loss on currencies of developing countries. Net translation loss of $3,155,811 on long-term debt in currencies of developed countries was deferred; no amortization was provided in 1971. Net loss on currencies in 1970 was $1,075,487, all of which was charged to income.

I. Retirement Plans The total cost of pension plans for all companies in the consolidated group in 1971 and 1970 was $20,580,388 and $17,177,000, respectively. Pension fund assets exceed the actuarially computed value of vested benefits.

J. Taxes on Income The provision for income taxes consists of:

	(In millions) 1971	1970
Taxes currently payable (net of investment tax credits, 1971, $5.0; 1970, $9.1)	$85.3	$88.2
Add (deduct)—deferred income taxes	5.7	(.1)
Provision for income taxes	$91.0	$88.1

K. Investment Grants Investment grants credited to income in 1971 and 1970 amounted to $894,405 and $200,000, respectively. At December 31, 1971, there were deferred investment grants of $8,248,031 to be used to offset future plant development costs.

L. Contingent Liabilities and Commitments Suits have been started against the Company and certain subsidiaries because of alleged product damage and other claims. All suits are being contested and the amount of uninsured liability thereunder, if any, is considered to be immaterial.

Lease rental payments (stated in millions) due in each of the five years after 1971 are: 1972, $42.4; 1973, $37.5; 1974, $33.1; 1975, $29.4; 1976, $27.5.

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CONDENSED COMPARATIVE STATEMENTS
The Dow Chemical Company and Subsidiary Companies

	1971	1970	1969	1968	1967	1961	1951
Financial Condition (in millions)							
Current Assets:							
Cash and marketable securities	$ 106.1	$ 78.6	$ 133.4	$ 141.7	$ 104.5	$ 48.5	$ 47.6
Receivables (less reserves)	504.3	445.1	430.0	357.9	307.0	135.6	42.7
Inventories	395.5	368.2	289.1	276.3	216.6	164.6	48.8
Total current assets	1,005.9	891.9	852.5	775.9	628.1	348.7	139.1
Current Liabilities:							
Notes payable	368.3	229.3	337.8	246.5	175.5	101.2	2
Accounts payable and accruals	366.8	350.6	291.1	272.4	199.0	86.2	41.6
Taxes on income	56.4	56.8	51.6	52.5	45.7	25.8	67.1
Total current liabilities	791.5	636.7	680.5	571.4	420.2	213.2	108.9
Working Capital (A)	214.4	255.2	172.0	204.5	207.9	135.5	30.2
Property (at cost)	2,722.9	2,524.3	2,305.1	2,060.4	1,756.0	1,307.8	384.5
Depreciation	1,158.8	1,086.1	1,010.1	933.4	859.9	696.0	104.2
Net property (B)	1,564.1	1,438.2	1,295.0	1,127.0	896.1	611.8	280.3
Other Assets (C)	508.7	474.7	498.5	441.6	426.6	96.3	9.5
Investment (A) plus (B) plus (C) (D)	2,287.2	2,168.1	1,965.5	1,773.1	1,530.6	843.6	320.0
Long-term Indebtedness	1,010.1	969.8	798.0	684.6	551.6	152.7	62.4
Other Liabilities and Reserves	80.1	70.8	61.0	46.6	5.8	1.3	36.4
Total (E)	1,090.2	1,040.6	859.0	731.2	557.4	154.0	98.8
Common Stockholders' Equity (D) minus (E)	$1,197.0	$1,127.5	$1,106.5	$1,041.9	$ 973.2	$ 689.6	$221.2
Income (in millions)							
Net sales of products and services	$2,052.7	$1,911.1	$1,797.1	$1,652.5	$1,382.7	$ 841.7	$339.6
Cost of sales	1,517.3	1,417.8	1,348.7	1,225.2	1,032.8	649.2	211.4
Selling and administrative expenses	250.7	233.7	208.7	198.8	135.0	96.5	20.7
Products and services operating income	284.7	259.6	239.7	228.5	214.9	96.0	107.5
Investment and sundry income—net	43.9	36.0	43.9	32.0	28.1	15.0	3.6
Interest income (expense)	(78.5)	(73.5)	(54.3)	(33.9)	(21.0)	(7.9)	(.4)
Non-products and services income (loss)	(34.6)	(37.5)	(10.4)	(1.9)	7.1	7.1	3.2
Taxes on income	91.0	88.1	81.5	92.0	87.7	42.3	69.0
Minority interests' share in income	4.7	4.0	5.2	4.0		(1.)	.2
Net income before extraordinary items	$ 154.4	$ 130.0	$ 142.6	$ 130.6	$ 134.3	$ 60.9	$ 41.5
Net income after extraordinary items	$ 154.7	$ 102.1	$ 142.6	$ 130.6	$ 134.3	$ 60.9	$ 41.5
Other Statistics (in millions)							
Additions to property	$ 364.6	$ 348.1	$ 370.6	$ 306.3	$ 192.3	$ 115.0	$ 91.0
Depreciation	218.8	207.7	177.9	157.2	136.0	99.4	22.4
Research and development expenses	95.3	91.5	87.3	83.8	76.8	51.0	17.0
Taxes (major)	161.8	136.5	140.7	144.5	125.9	70.4	75.0
Wages and salaries paid	464.7	433.2	410.6	385.1	325.6	224.3	73.9
Cost of employee benefits	72.2	64.4	56.3	47.9	33.6	21.2	7.2
Number of employees at year-end (thousands)	47.8	47.4	47.4	47.4	36.4	30.6	17.8
Cash dividends declared on Common Stock	81.0	78.5	77.3	72.5	66.1	43.5	15.2
Per share of Common Stock (in dollars) ( )							
Earnings before extraordinary items	3.40	2.87	3.14	2.89	2.98	1.35	1.09
Earnings after extraordinary items	3.41	2.26	3.14	2.89	2.98	1.35	1.09
Cash dividends paid	1.77	1.73	1.67	1.57	1.43	.91	.32
Market closing price on December 31	78.88	49.08	45.75	52.00	58.08	46.86	20.76

( ) Adjusted for stock splits and stock dividends.

LOCATIONS & HOLDINGS

The Dow Chemical Company
Corporate Headquarters
2030 Dow Center
Midland, Michigan 48640

UNITED STATES

45 Manufacturing Locations in 25 States and 1 Territory*

Arizona – Tucson
Arkansas – Magnolia, Russellville
California – Costa Mesa, Fresno, Pico Rivera, Pittsburg, Torrance, Van Nuys
Colorado – Denver, Golden
Connecticut – Gales Ferry, Trumbull
Florida – Miami
Georgia – Dalton, Lawrenceville
Hawaii – Honolulu
Indiana – Decatur, Indianapolis, Zionsville
Iowa – Davenport
Kentucky – Carrollton, Elizabethtown
Louisiana – Plaquemine
Michigan – Bay City, Ludington, Midland
Minnesota – Biwabik
Missouri – Cape Girardeau, Pevely
New Jersey – Carteret
New York – New York
North Carolina – Greensboro
Ohio – Cleveland, Findlay, Ironton, Newark
Oklahoma – Tulsa
Pennsylvania – Royersford
South Carolina – Anderson
Texas – Freeport, Oyster Creek
Virgin Islands – St. Croix
Virginia – Williamsburg
Washington – Wenatchee

Principal Partly Owned Companies:

Cordis Dow Corp., Miami, Florida (50%)
Dolco Packaging Corp., Los Angeles, California (50%)
Dow Badische Company, Williamsburg Virginia (50%)
Dow Corning Corporation, Midland, Michigan (50%)
The Kartridg Pak Co., Davenport, Iowa (50%)
Oasis Pipe Line Company, Houston, Texas (30%)

EUROPE

21 Manufacturing Locations in 9 Countries

Belgium – Seneffe
France – Drusenheim
Germany – Greffern, Stade
Greece – Lavrion
Italy – Brindisi, Cuneo, Livorno, Milan, Naples, Venice
The Netherlands – Rotterdam, Terneuzen
Portugal – Lisbon
Spain – Barcelona, Bilbao, Madrid, Santander, Tarragona
United Kingdom – King's Lynn, England, Barry, Wales

Principal Partly Owned Companies:

Bank Mendes Gans, Amsterdam, The Netherlands (40%)
Compagnie des Services Dowell Schlumberger, Paris, France (50%)
Dowell Schlumberger Corporation, London, England (50%)
Dow-Unquinesa S.A., Bilbao, Spain (85%)
Gruppo Lepetit S.p.A., Milan, Italy (78%)

LATIN AMERICA

11 Manufacturing Locations in 6 Countries*.

Argentina – Buenos Aires, Córdoba, San Lorenzo
Brazil – Guarujá, São Paulo
Chile – Concepción, Santiago
Colombia – Barrancabermeja, Cartagena
Ecuador – Quito
Mexico – Mexico City

Principal Partly Owned Companies:

Atanor S.A.M., Buenos Aires, Argentina (24%)
Banco Cidade de São Paulo, S.A., São Paulo, Brazil (45%)
Laboratorios Industriales Farmaceuticos Ecuatorianos, Quito, Ecuador (63%)
Petroquimica Dow S.A., Concepción, Chile (70%)
Piramides Brasilia S.A. Industria e Comercio São Paulo, Brazil (23%)

CANADA

10 Manufacturing Locations in 4 Provinces:

Alberta – Edmonton, Fort Saskatchewan
British Columbia – Ladner
Ontario – Don Mills, Sarnia, Thunder Bay, Toronto, Weston
Quebec – Montreal, Varennes

PACIFIC

13 Manufacturing Locations in 6 Countries*

Australia – Altona, Brisbane, Rhodes, Smithfield
India – Bombay
Japan – Kawasaki, Mizushima, Noheji, Sapporo, Suzuka
Korea – Ulsan (under construction)
Malaysia – Kuala Lumpur
New Zealand – New Plymouth

Principal Partly Owned Companies

Asahi-Dow Limited, Tokyo, Japan (50%)
Consolidated Fertilizers Ltd., Brisbane Australia (20%)
Ivon Watkins-Dow Limited, New Plymouth New Zealand (50%)
Korea Pacific Chemical Corporation Ulsan, Korea (50%)
Pacific Chemicals Berhad, Kuala Lumpur, Malaysia (50%)
Polychem Limited, Bombay, India (25%)

*Includes wholly and partly owned companies

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