PUBLIC RELATIONS DEPARTMENT 270 Park Avenue, New York, N. Y. 1001

MEMORANDUM

TO: PRD Staff June 20, 1972
Communications Network List

CC: Division Employee Relations Managers
Mr. E. C. Axtmann
Mr. H. R. Morrison (40)

Subject: Updated Version of
Background and Growth
Articles on Union Carbide

Attached for your information are revised versions of the Background and Growth articles on Union Carbide. If you need additional copies, they can be obtained from PRD Files (3870).

HELEN I. MORRIS

HIM:MAK
Att.

BACKGROUND INFORMATION ON UNION CARBIDE CORPORATION

Union Carbide is a worldwide organization, serving markets in over 100 countries. It is a publicly owned company, with approximately 200,000 stockholders. From headquarters in New York City in the 52-story Union Carbide Building at 270 Park Avenue is coordinated a vast network of nearly 500 plants, mines, mills, and laboratories operated by the Corporation and its affiliated companies throughout the world. Outside the United States and Puerto Rico, Union Carbide has interests in approximately 150 affiliated companies engaged in manufacturing, mining, and selling operations in more than 30 countries.

In 1971, the Corporation's worldwide sales were $3 billion and earnings were $158 million. At the end of the year, the Corporation and its majority-owned subsidiaries throughout the world employed 99,000 people. Of the total, about 53,000 were employed in the United States and Puerto Rico. This does not include 15,000 employees at nuclear energy installations operated by Union Carbide for the U. S. Government at Oak Ridge, Tennessee, and Paducah, Kentucky. Majority-owned subsidiaries abroad -- including Canada -- employed about 46,000. Not included in the worldwide total are 13,000 employees of 20 to 50 per cent-owned international affiliated companies.

Union Carbide is made up of many different businesses with interrelated products and technologies. The Corporation is generally classified as a chemical company. However, it also produces plastics, gases and related products, materials systems, metals and carbon products, and consumer and related products. Some of the consumer products are sold under trade marks well known to the public -- PRESTONE anti-freeze, EVEREADY batteries, and GLAD plastic household products.

5/25/72

The majority of Union Carbide's products are unseen in everyday life because they are the raw materials of industry. As such, they help to satisfy many human needs. For instance, they help make possible better food, clothing, and medicines; faster and safer transportation; quicker communications; and more attractive and comfortable homes.

Union Carbide pioneered what is known as the petrochemicals industry. Today, the Corporation's many hundreds of chemicals find their way into every major branch of industry and end up in everything from floor waxes to shampoos. Among them are chemicals added to gasoline to help prevent the stalling of automobiles, and to jet fuels to help prevent engine flame-out; and latexes for the popular water-based paints. About 200 chemicals are made for the textile industry alone. Some are basic ingredients from which many textiles are spun; others are used to impart finishes that make clothes wear better and resist soiling, wrinkling, and shrinking. Polyester fibers are a growing market, for example, for the Corporation's ethylene glycol. Many Union Carbide chemicals are also used by cosmetic and pharmaceutical manufacturers and formulators.

A variety of silicone products is produced -- including chemicals, oils, resins, and rubber-like materials known as elastomers. An important use for Union Carbide's silicones is in the manufacture of urethane foams. Silicones also serve as insulating materials in electrical and electronic equipment; and they are used in making missile components, paints, automobile and furniture polishes, cosmetics, and many other products.

The Corporation's agricultural chemicals research program has produced a wide variety of pesticides. The most widely known product is SEVIN insecticide, which is being used increasingly all over the world to protect farmers' crops against destructive insects. It is effective in controlling more than 200 different kinds of insects and is safer to handle than many other pesticides.

Another promising new agricultural product, which has become exceedingly popular with both commercial growers and home gardeners, is seed tape -- a ribbon of plastic containing vegetable and flower seeds for easier and more uniform planting.

Union Carbide also has been a pioneer in the plastics field. It is currently providing industry with several thousand different formulations of a number of plastic materials -- including epoxies, parylenes, phenolics, polyethylenes, polystyrenes, polysulfones, and vinyls. Some of these products are sold in the form of powdered and liquid resins; others, in the form of rigid or flexible film and sheeting. Customers then mold, extrude, or otherwise fabricate these materials into the many familiar plastic products that are used in everyday life.

Steelmaking in the U. S. alone is currently consuming in excess of 10 million tons a year of high-purity oxygen -- another important Corporation product. A number of other useful gases -- nitrogen, hydrogen, argon, helium, krypton, neon, and xenon -- are also produced. While the metals industry is the biggest consumer of these gases -- using them not only in the production of steel, but also in various metalworking processes -- the chemical processing and missiles industries are also important customers. Liquid oxygen, nitrogen, hydrogen, and helium are all used in firing rockets and missiles. Oxygen is also furnished to hospitals for medical uses, and the Corporation's proprietary UNOX system using high-purity oxygen for wastewater treatment has gained worldwide acceptance. Increased use is being made of liquid nitrogen in POLARSTREAM in-transit refrigeration of food; also in biological applications, such as the freezing and preservation of blood.

Those who make steel, cast iron, aluminum, and copper buy over 100 different alloys and alloying metals from Union Carbide. Alloying agents are added to steel and other metals to control their behavior -- fortifying them against intense heat, corrosion, and the various strains that they are subjected

to in automobiles, aircraft, and other applications. Ferrochromium, for example, makes steel "stainless." The Corporation's alloys also are used to remove impurities from molten metal during its manufacture. To obtain raw materials for these products, extensive minerals exploration is carried on throughout the world, and ores containing key metal elements are mined and processed by the Corporation. Union Carbide is a major supplier of chromium, manganese, silicon, vanadium, tungsten, tantalum, and columbium.

Many different forms of carbon and graphite (a highly refined carbon) are produced by Union Carbide for a wide variety of industrial uses. The most important are the huge carbon and graphite electrodes that power electric furnaces used in making steel, ferroalloys, calcium carbide, and phosphorus. Powerful lighting carbons are manufactured for use in motion picture projection, studio lighting, searchlights, solar simulation, spectroscopic analysis, and for other special lighting applications. Union Carbide also makes carbon brushes, which transfer electricity in motors and generators and are essential to the operation of aircraft electrical equipment and diesel electric locomotives. Special forms of graphite are produced for the aerospace and nuclear industries. One of the Corporation's specialty carbon products is THORNEL graphite yarn, a promising high-temperature material that may find major use in aircraft frame and engine components.

Union Carbide also provides industry with high-performance materials and systems specially designed to operate in stress environments where unusual conditions of corrosion and wear exist. A Coatings Service is furnished, using special techniques for applying wear-resistant surfaces to engine and structural components of commercial aircraft to make them last longer. Among the Corporation's high-performance products are Molecular Sieves, which are unique materials with the ability to separate molecules of gas and liquid mixtures. They serve as both adsorbents and catalysts in the petroleum and chemical industries. New processes

employing Molecular Sieves are being used to remove pollutants from industrial waste streams. Another high-performance area in which Union Carbide operates is the field of electronics. Activities include the production of solid tantalum and plastic film capacitors, barium getters for radio and television tubes, and synthetic crystals for industrial and research use. The Corporation also is active in the field of laser research, development, and production.

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The Corporation is active in the specialty fibers business and produces other products associated with the textile industry and related "soft goods" industries. Among these products are DYNEL modacrylic fibers, popular in wigs, deep pile coats, and flame-resistant clothing, draperies, carpeting, and upholstery materials; UNEL spandex fiber for a variety of stretch fabrics; KRENE vinyl film and sheet for curtains, closet accessories, and other household goods; and FIBERBOND nonwoven materials for use principally in automotive upholstery and trim.

The Corporation makes food casings of cellulose and plastic films, employed in both the production and packaging of food -- such as frankfurters, sausages, poultry, fish, and ready-to-serve meats. Its food casings made possible the development of the "skinless" frankfurter. Special packaging systems recently developed are used for processing and wrapping cuts of beef and other fresh meats. Another growing plastics packaging business is the use of polyethylene for pallet shrink-packaging and bundle-wrapping of products.

Union Carbide has been active in the field of nuclear energy for many years. In addition to supplying basic materials -- such as uranium concentrates -- required for nuclear energy production, the Corporation is responsible for operation of the nuclear energy facilities at Oak Ridge, Tennessee, and Paducah, Kentucky, which are owned by the U. S. Government. These facilities include plants for producing fissionable uranium, the key material for nuclear energy production; a research and production facility, which has provided sophisticated equipment for space missions; and one of the world's largest nuclear research centers, Oak Ridge National Laboratory, doing important work on nuclear reactors for generating electric power, as well as studies of life processes and environmental problems. Union Carbide also has its own nuclear reactor at Sterling Forest, New York, which provides radioisotopes and irradiation services for industrial and medical uses.

THE GROWTH OF UNION CARBIDE CORPORATION AND ITS DIVISIONS

Union Carbide was formally incorporated in 1917 as "Union Carbide and Carbon Corporation." This name and its initial assets, however, trace back to two earlier events that were to have a profound effect in shaping the Corporation's course.

The first event took place in 1876, when Clevelanders crowded into the Public Square to see Charles F. Brush's brilliant carbon arc street light change night into day. This invention sparked the formation of a company in 1886 to make various miscellaneous carbon products -- including carbons for electric arc street lights and later carbon electrodes for electric furnaces. The company, which was the forerunner of the Corporation's present Carbon Products Division, brought to the Corporation the famous EVEREADY trade mark. In 1890, it produced the world's first commercial dry cell battery and, in 1894, built one of the first industrial research laboratories in America.

The second event, which was to supply the words "Union Carbide," took place in North Carolina in 1892. In an attempt to make aluminum in an electric furnace, Thomas L. Willson and Major James T. Morehead produced calcium carbide -- and from it acetylene. Although both products were considered mere laboratory curiosities, the optimistic Major Morehead interested several Chicago entrepreneurs in the use of acetylene for city and home lighting. A group of them formed the Union Carbide Company in 1898 to manufacture calcium carbide.

The Gathering Forces

Although Major Morehead had found a market for his carbide, he did not lose either his interest or his faith in the metalmaking capabilities of his electric furnace. With the aid of Guillaume de Chalmot, he produced

in 1897 America's first commercial high-carbon ferrochrome and furnished ferrochrome for armorplate during the Spanish-American War.

This metallurgical business was watched with interest by the people who had organized Union Carbide Company, for by this time the advent of electric lighting had killed any hopes they had for expansion of the acetylene lighting business. In 1906, the Union Carbide group purchased the alloys business and also a metals research laboratory. They then set up a separate company to produce alloys for steelmaking -- one of the forerunners of the present Ferroalloys Division. Under the direction of Dr. Frederick M. Becket, chief metallurgist, the new company soon had a whole line of alloying metals and made many noteworthy achievements in the metals field. For example, a method was devised for making low-carbon ferrochrome, which made possible the development of stainless steel.

Also pleased by the metalmaking enterprise were the producers of electrodes. Their business, too, would profit from the growth of the alloymaking industry since carbon electrodes were needed to power the electric furnaces in which the alloying metals were made.

About this same time, a further development was taking place in Europe that was to bring into the picture still another company. Scientists in France had discovered that an intensely hot metalcutting flame could be produced by burning acetylene with oxygen. This discovery resulted in the demand for large quantities of oxygen and acetylene. Since the latter product was derived from carbide produced in electric furnaces, Charles Brush managed to interest several electrode producers in forming America's first oxygen-producing company in 1907. This company was later to become the Corporation's present Linde Division.

The success of the oxygen venture quickly caught the attention of the acetylene producers, and in 1911 Union Carbide bought the oxygen company -- bringing together for the first time the carbon and carbide interests. Thus the stage was set for further consolidations.

The Corporation Is Formed

Up to this point, the largest single purchaser of calcium carbide had been The Prest-O-Lite Company, which was making acetylene lamps for America's expanding fleet of horseless carriages. An alternate source of acetylene was desired, and Dr. George O. Curme, Jr. was hired by Prest-O-Lite in 1914 to find it. At the new Mellon Institute of Industrial Research in Pittsburgh, he met scientists from the Linde Company and from the Union Carbide Company working on other aspects of acetylene research. The mutual interests of these companies -- in research, in acetylene, in electric furnaces, and in carbon electrodes -- did not go unnoticed. It was decided that the companies' operations would be more profitable if they worked together as a team; and to accomplish this, Union Carbide and Carbon Corporation was formed in November, 1917.

Meeting Wartime Needs

Since the new corporation was established during a time of war, it soon found itself with a number of requests to produce materials never before made in the United States -- helium for dirigibles, ferrozirconium for armorplating, and activated carbon for gas masks. So urgent was the need for these products that similar requests were also made to other companies.

Fortunately, the newly formed Union Carbide was able not only to produce the materials needed in larger than the stipulated quantities,

but also to produce them on or before the requested date. This ability to leap from laboratory-scale operation into immediate full-scale production was to be repeated many times -- in World War II, when butadiene, polyethylene, synthetic gem bearings, uranium, energizers for proximity fuses, and cast jet turbine blades were required; in the Korean conflict, when sapphire windows were needed for the Navy's Sidewinder missiles; and in the Cold War and Space Race, when satellite components, space age materials, and huge quantities of liquid oxygen for fuel were sought.

In 1917, with the incorporation of Union Carbide, the need for Dr. Curme's synthetic acetylene had disappeared. The possible need for ethylene for government use, however, renewed the Corporation's interest in the hydrocarbon by-products of acetylene that were rich in ethylene.

The first production of synthetic ethylene took place in 1919. With the war's end, this project and the chemical activities of the Corporation might well have ceased had not Dr. Curme and an associate -- James A. Rafferty -- foreseen the growing potential for synthetic organic chemicals. From this vision was born America's petrochemicals industry and the Corporation's chemicals business. In 1920, a chemicals company was formed.

The Challenge of Changing Markets

During the period immediately following World War 1, the Corporation found itself faced with the problem not so much of creating new products, as of creating new markets for the chemicals that were gushing out of its pipelines and the many product improvements that were flowing off the drawing boards as a result of its combined research efforts. To meet the challenge, the Corporation pioneered in customer service. It hired technically trained salesmen to spot both present and potential customer needs for the Corporation's products.

To fill a basic need, for example, an anti-freeze for automobile radiators was developed from ethylene glycol -- today's well-known PRESTONE anti-freeze. A small battery was developed to make possible portable radios. Quiet, flickerless carbons were available to project the first sound movies. The Corporation also had on hand, when needed, ferroalloys to fortify the steels used to build the skyscrapers, bridges, automobiles, and airplanes that were to change America's landscape; and the raw materials to make the plastics, the synthetic fibers, and the stainless steels that would change our way of life.

To round out its ability as a one-stop materials and service center for American industry, the Corporation in 1920 added to its metallurgical capabilities technology in the field of corrosion - and heat-resistant alloys (operations of the former Haynes Stellite Company). It also acquired, in 1926, vanadium interests on the Colorado Plateau, which were later to furnish uranium for atomic energy. To its carbon activities, it added the graphite skills of the Acheson Graphite Corporation in 1928.

The wide range of the Corporation's activities was made evident at the Chicago World's Fair in 1933, when Union Carbide alone was able to supply for display purposes more than half of the known chemical elements. It is of interest to note that today, with all its many interests, Union Carbide works with over 90 of the chemical elements that have been isolated and named so far by scientists.

By 1937, the clouds of war were once again darkening the world, threatening the flow of supplies from overseas. The Corporation turned its attention to further development of its raw material resources and to finding uses for the by-products of its production.

Research on the tailings of vanadium from Corporation properties on the Colorado Plateau was to provide uranium, which catapulted the Corporation into the government's atomic energy program and provided the basis for the Corporation's position as one of the most diversified private enterprises in the field of nuclear energy. Government need and a background of research in flame technology were to lead to the production of synthetic sapphires and rubies and the famed LINDE Stars; and high-pressure research, to America's first commercial polyethylene.

In 1939, Union Carbide resumed its butadiene studies, begun many years before, which were to make America's synthetic rubber program a success. In the same year, the Corporation acquired the Bakelite Corporation -- an outgrowth of the country's first phenolic plastic -- which further expanded its technology in the field of plastics.

Branching Out Into New Fields

During the 1950's, Union Carbide started consolidating activities that were becoming increasingly important and also extended its interests into a number of new fields. A division was set up to handle worldwide ore procurement -- the responsibility of the present Mining and Metals Division. Canadian operations were consolidated into one company -- Union Carbide Canada Limited. A Nuclear Division was formed to follow up atomic energy research begun in 1937 and to manage nuclear facilities at Oak Ridge, Tennessee, and Paducah, Kentucky, operated by Union Carbide for the government. A food casings business was acquired (formerly known as the Visking Company).

By 1957, Union Carbide and Carbon Corporation had some 400 plants in the United States and Canada and had affiliated companies in many countries overseas. In that year, to take advantage of the growing public

awareness of its activities, the Corporation shortened its name to Union Carbide Corporation.

To give increased emphasis to growing sales of consumer products, a separate division was set up in 1959 to handle these activities. The two principal product lines of the Consumer Products Division at that time were EVEREADY batteries and PRESTONE anti-freeze, the same ethylene glycol product first produced by Union Carbide in 1926 -- which still holds the top position in the extremely competitive anti-freeze market.

In 1960, already spread out through 14 separate buildings in New York City, the Corporation moved into new headquarters at 270 Park Avenue -- a 52-story skyscraper of gleaming stainless steel and glass. This is the nerve center of Union Carbide's far-flung operations around the world.

More expansions and more consolidations followed throughout the 1960's. In 1964, a Fibers and Fabrics Division was formed to promote DYNEL fibers and other products associated with the wig, textile, and related soft goods industries. Two years later, international operations were restructured and new subsidiaries were set up to oversee foreign activities. These subsidiaries are: Union Carbide Pan America, Inc., which represents the Corporation's interests in Latin America; Union Carbide Europe, Inc., representing Corporation interests in the United Kingdom and Continental Europe; Union Carbide Eastern Inc., which oversees interests in Asia and Oceania; and Union Carbide Africa and Middle East, Inc., concerned with interests in those two areas. Canadian interests, as already mentioned, come under Union Carbide Canada Limited, a 75 per cent owned subsidiary.

About the same time, the activities of the Chemicals and Plastics Group were realigned to structure the divisions within this group more

around the markets they serve. Divisions set up were: the Coatings Intermediates Division, Hydrocarbons Division, Plastic Products Division, Process Chemicals Division, and the Chemicals and Plastics Operations Division.

In 1967, the Materials Systems Division was established to integrate and expand the Corporation's capabilities in high-performance materials. The same year, a wholly owned subsidiary, Union Carbide Petroleum Corporation, was formed to be responsible for obtaining profitable petroleum and natural gas supplies for the Corporation to serve as raw materials for divisions within the Chemicals and Plastics Group.

The plastics films business, in 1969, was consolidated with activities in food casings and related products and the Food Products Division (which took over the Visking casings business) was renamed the Films - Packaging Division.

Also, during 1969, several businesses were sold, including a pharmaceutical operation (Neisler Laboratories, Inc. acquired in 1965) and the Stellite high-performance products segment of the materials systems business. Both were profitable, but it was felt that the money and technical skills invested in them could be better utilized in expanding other businesses with greater growth potential.

A Corporate Development Group was formed early in 1970 to encompass the Corporation's new business development activity and research programs aimed predominantly at initiation of new business opportunities. Within this group are operations of the Materials Systems Division; Ocean Systems, Inc., a majority-owned subsidiary engaged in underwater work; and the Nuclear Division, with responsibility for operation of government-owned nuclear energy facilities at Oak Ridge, Tennessee, and Paducah, Kentucky.

Later in the year, the Corporation sold The Englander Company, Inc., a wholly owned subsidiary acquired in 1964, making mattresses and other bedding equipment. This was a marginal operation that did not fit in with the Corporation's current growth plan.

In 1971, as part of a program aimed at reducing investment in operations outside its primary business areas, the Corporation sold its oil and gas interests, held by Union Carbide Petroleum Corporation. During the year, Union Carbide also disposed of an instrument business involving a line of pollution monitoring devices for air and water analysis. Another major change was the integration of the Corporate Technology Department with the New Business Development Department to form an organization for pursuing new business directions, including new products or markets not currently the responsibility of other operating groups.

Early in 1972, the four business divisions and the operations division involved in the chemicals and plastics portion of the Corporation's business were merged into a single unit -- the Chemicals and Plastics Group. In May, the Fibers and Fabrics Division of the Corporation was consolidated into the Films -- Packaging Division to effect needed economies and to coordinate the business interests of the two divisions. The change involved all activities except those of the Non-Wovens Department, which were transferred to the Corporate Development Group.

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Union Carbide was formally incorporated in 1917 as "Union Carbide and Carbon Corporation." This name and its initial assets, however, trace back to two earlier events that were to have a profound effect in shaping the Corporation's course.

The first event took place in 1876, when Clevelanders crowded into the Public Square to see Charles F. Brush's brilliant carbon arc street light change night into day. This invention sparked the formation of a company in 1886 to make various miscellaneous carbon products -- including carbons for electric arc street lights and later carbon electrodes for electric furnaces. The company, which was the forerunner of the Corporation's present Carbon Products Division, brought to the Corporation the famous EVEREADY trade mark. In 1890, it produced the world's first commercial dry cell battery and, in 1894, built one of the first industrial research laboratories in America.

The second event, which was to supply the words "Union Carbide," took place in North Carolina in 1892. In an attempt to make aluminum in an electric furnace, Thomas L. Willson and Major James T. Morehead produced calcium carbide -- and from it acetylene. Although both products were considered mere laboratory curiosities, the optimistic Major Morehead interested several Chicago entrepreneurs in the use of acetylene for city and home lighting. A group of them formed the Union Carbide Company in 1898 to manufacture calcium carbide.

The Gathering Forces

Although Major Morehead had found a market for his carbide, he did not lose either his interest or his faith in the metalmaking capabilities of his electric furnace. With the aid of Guillaume de Chalmot, he produced

in 1897 America's first commercial high-carbon ferrochrome and furnished ferrochrome for armorplate during the Spanish-American War.

This metallurgical business was watched with interest by the people who had organized Union Carbide Company, for by this time the advent of electric lighting had killed any hopes they had for expansion of the acetylene lighting business. In 1906, the Union Carbide group purchased the alloys business and also a metals research laboratory. They then set up a separate company to produce alloys for steelmaking -- one of the forerunners of the present Ferroalloys Division. Under the direction of Dr. Frederick M. Becket, chief metallurgist, the new company soon had a whole line of alloying metals and made many noteworthy achievements in the metals field. For example, a method was devised for making low-carbon ferrochrome, which made possible the development of stainless steel.

Also pleased by the metalmaking enterprise were the producers of electrodes. Their business, too, would profit from the growth of the alloymaking industry since carbon electrodes were needed to power the electric furnaces in which the alloying metals were made.

About this same time, a further development was taking place in Europe that was to bring into the picture still another company. Scientists in France had discovered that an intensely hot metalcutting flame could be produced by burning acetylene with oxygen. This discovery resulted in the demand for large quantities of oxygen and acetylene. Since the latter product was derived from carbide produced in electric furnaces, Charles Brush managed to interest several electrode producers in forming America's first oxygen-producing company in 1907. This company was later to become the Corporation's present Linde Division.

The success of the oxygen venture quickly caught the attention of the acetylene producers, and in 1911 Union Carbide bought the oxygen company -- bringing together for the first time the carbon and carbide interests. Thus the stage was set for further consolidations.

The Corporation Is Formed

Up to this point, the largest single purchaser of calcium carbide had been The Prest-O-Lite Company, which was making acetylene lamps for America's expanding fleet of horseless carriages. An alternate source of acetylene was desired, and Dr. George O. Curme, Jr. was hired by Prest-O-Lite in 1914 to find it. At the new Mellon Institute of Industrial Research in Pittsburgh, he met scientists from the Linde Company and from the Union Carbide Company working on other aspects of acetylene research. The mutual interests of these companies -- in research, in acetylene, in electric furnaces, and in carbon electrodes -- did not go unnoticed. It was decided that the companies' operations would be more profitable if they worked together as a team; and to accomplish this, Union Carbide and Carbon Corporation was formed in November, 1917.

Meeting Wartime Needs

Since the new corporation was established during a time of war, it soon found itself with a number of requests to produce materials never before made in the United States -- helium for dirigibles, ferrozirconium for armorplating, and activated carbon for gas masks. So urgent was the need for these products that similar requests were also made to other companies.

Fortunately, the newly formed Union Carbide was able not only to produce the materials needed in larger than the stipulated quantities,

but also to produce them on or before the requested date. This ability to leap from laboratory-scale operation into immediate full-scale production was to be repeated many times -- in World War II, when butadiene, polyethylene, synthetic gem bearings, uranium, energizers for proximity fuses, and cast jet turbine blades were required; in the Korean conflict, when sapphire windows were needed for the Navy's Sidewinder missiles; and in the Cold War and Space Race, when satellite components, space age materials, and huge quantities of liquid oxygen for fuel were sought.

In 1917, with the incorporation of Union Carbide, the need for Dr. Curme's synthetic acetylene had disappeared. The possible need for ethylene for government use, however, renewed the Corporation's interest in the hydrocarbon by-products of acetylene that were rich in ethylene.

The first production of synthetic ethylene took place in 1919. With the war's end, this project and the chemical activities of the Corporation might well have ceased had not Dr. Curme and an associate -- James A. Rafferty -- foreseen the growing potential for synthetic organic chemicals. From this vision was born America's petrochemicals industry and the Corporation's chemicals business. In 1920, a chemicals company was formed.

The Challenge of Changing Markets

During the period immediately following World War 1, the Corporation found itself faced with the problem not so much of creating new products, as of creating new markets for the chemicals that were gushing out of its pipelines and the many product improvements that were flowing off the drawing boards as a result of its combined research efforts. To meet the challenge, the Corporation pioneered in customer service. It hired technically trained salesmen to spot both present and potential customer needs for the Corporation's products.

To fill a basic need, for example, an anti-freeze for automobile radiators was developed from ethylene glycol -- today's well-known PRESTONE anti-freeze. A small battery was developed to make possible portable radios. Quiet, flickerless carbons were available to project the first sound movies. The Corporation also had on hand, when needed, ferroalloys to fortify the steels used to build the skyscrapers, bridges, automobiles, and airplanes that were to change America's landscape; and the raw materials to make the plastics, the synthetic fibers, and the stainless steels that would change our way of life.

To round out its ability as a one-stop materials and service center for American industry, the Corporation in 1920 added to its metallurgical capabilities technology in the field of corrosion - and heat-resistant alloys (operations of the former Haynes Stellite Company). It also acquired, in 1926, vanadium interests on the Colorado Plateau, which were later to furnish uranium for atomic energy. To its carbon activities, it added the graphite skills of the Acheson Graphite Corporation in 1928.

The wide range of the Corporation's activities was made evident at the Chicago World's Fair in 1933, when Union Carbide alone was able to supply for display purposes more than half of the known chemical elements. It is of interest to note that today, with all its many interests, Union Carbide works with over 90 of the chemical elements that have been isolated and named so far by scientists.

By 1937, the clouds of war were once again darkening the world, threatening the flow of supplies from overseas. The Corporation turned its attention to further development of its raw material resources and to finding uses for the by-products of its production.

Research on the tailings of vanadium from Corporation properties on the Colorado Plateau was to provide uranium, which catapulted the Corporation into the government's atomic energy program and provided the basis for the Corporation's position as one of the most diversified private enterprises in the field of nuclear energy. Government need and a background of research in flame technology were to lead to the production of synthetic sapphires and rubies and the famed LINDÉ Stars; and high-pressure research, to America's first commercial polyethylene.

In 1939, Union Carbide resumed its butadiene studies, begun many years before, which were to make America's synthetic rubber program a success. In the same year, the Corporation acquired the Bakelite Corporation -- an outgrowth of the country's first phenolic plastic -- which further expanded its technology in the field of plastics.

Branching Out Into New Fields

During the 1950's, Union Carbide started consolidating activities that were becoming increasingly important and also extended its interests into a number of new fields. A division was set up to handle worldwide ore procurement -- the responsibility of the present Mining and Metals Division. Canadian operations were consolidated into one company -- Union Carbide Canada Limited. A Nuclear Division was formed to follow up atomic energy research begun in 1937 and to manage nuclear facilities at Oak Ridge, Tennessee, and Paducah, Kentucky, operated by Union Carbide for the government. A food casings business was acquired (formerly known as the Visking Company).

By 1957, Union Carbide and Carbon Corporation had some 400 plants in the United States and Canada and had affiliated companies in many countries overseas. In that year, to take advantage of the growing public

awareness of its activities, the Corporation shortened its name to Union Carbide Corporation.

To give increased emphasis to growing sales of consumer products, a separate division was set up in 1959 to handle these activities. The two principal product lines of the Consumer Products Division at that time were EVEREADY batteries and PRESTONE anti-freeze, the same ethylene glycol product first produced by Union Carbide in 1926 -- which still holds the top position in the extremely competitive anti-freeze market.

In 1960, already spread out through 14 separate buildings in New York City, the Corporation moved into new headquarters at 270 Park Avenue -- a 52-story skyscraper of gleaming stainless steel and glass. This is the nerve center of Union Carbide's far-flung operations around the world.

More expansions and more consolidations followed throughout the 1960's. In 1964, a Fibers and Fabrics Division was formed to promote DYNEL fibers and other products associated with the wig, textile, and related soft goods industries. Two years later, international operations were restructured and new subsidiaries were set up to oversee foreign activities. These subsidiaries are: Union Carbide Pan America, Inc., which represents the Corporation's interests in Latin America; Union Carbide Europe, Inc., representing Corporation interests in the United Kingdom and Continental Europe; Union Carbide Eastern Inc., which oversees interests in Asia and Oceania; and Union Carbide Africa and Middle East, Inc., concerned with interests in those two areas. Canadian interests, as already mentioned, come under Union Carbide Canada Limited, a 75 per cent owned subsidiary.

About the same time, the activities of the Chemicals and Plastics Group were realigned to structure the divisions within this group more

around the markets they serve. Divisions set up were: the Coatings Intermediates Division, Hydrocarbons Division, Plastic Products Division, Process Chemicals Division, and the Chemicals and Plastics Operations Division.

In 1967, the Materials Systems Division was established to integrate and expand the Corporation's capabilities in high-performance materials. The same year, a wholly owned subsidiary, Union Carbide Petroleum Corporation, was formed to be responsible for obtaining profitable petroleum and natural gas supplies for the Corporation to serve as raw materials for divisions within the Chemicals and Plastics Group.

The plastics films business, in 1969, was consolidated with activities in food casings and related products and the Food Products Division (which took over the Visking casings business) was renamed the Films - Packaging Division.

Also, during 1969, several businesses were sold, including a pharmaceutical operation (Neisler Laboratories, Inc. acquired in 1965) and the Stellite high-performance products segment of the materials systems business. Both were profitable, but it was felt that the money and technical skills invested in them could be better utilized in expanding other businesses with greater growth potential.

A Corporate Development Group was formed early in 1970 to encompass the Corporation's new business development activity and research programs aimed predominantly at initiation of new business opportunities. Within this group are operations of the Materials Systems Division; Ocean Systems, Inc., a majority-owned subsidiary engaged in underwater work; and the Nuclear Division, with responsibility for operation of government-owned nuclear energy facilities at Oak Ridge, Tennessee, and Paducah, Kentucky.

Later in the year, the Corporation sold The Englander Company, Inc., a wholly owned subsidiary acquired in 1964, making mattresses and other bedding equipment. This was a marginal operation that did not fit in with the Corporation's current growth plan.

In 1971, as part of a program aimed at reducing investment in operations outside its primary business areas, the Corporation sold its oil and gas interests, held by Union Carbide Petroleum Corporation. During the year, Union Carbide also disposed of an instrument business involving a line of pollution monitoring devices for air and water analysis. Another major change was the integration of the Corporate Technology Department with the New Business Development Department to form an organization for pursuing new business directions, including new products or markets not currently the responsibility of other operating groups.

Early in 1972, the four business divisions and the operations division involved in the chemicals and plastics portion of the Corporation's business were merged into a single unit -- the Chemicals and Plastics Group. In May, the Fibers and Fabrics Division of the Corporation was consolidated into the Films -- Packaging Division to effect needed economies and to coordinate the business interests of the two divisions. The change involved all activities except those of the Non-Wovens Department, which were transferred to the Corporate Development Group.