HISTORY

OF THE

DU PONT PAINT

BUSINESS

1947 - 1961

MANUSCRIPT BY:
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6/8/92

To: Virginia

Enclosed is a copy of the 2 Volume Manuscript "History of the Du Pont Paint Business, 1947-1961." This is one of only a couple copies which exist. The original manuscript is at the Hagley Museum. Please keep this copy in your library. Thanks.

Linda

DU PONT

Confidential

HISTORY

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Du Pont Paint

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J W Nestor's Copy

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VOLUME 1

HISTORY OF THE DU PONT PAINT BUSINESS

Human nature being what it is, man is forever pausing to ask: "By what route did I come to this place? What were the more important milestones that marked my progress?" So it is with a business.

There are those who maintain that the story of the growth of a business is a ledger filled with dry and dusty facts; that nowhere within its covers will you find the wine of that which we call romance, or the senses of achievement and frustration that are so peculiarly human.

I do not believe these people.

I believe that the story of Du Pont and its part in the paint business is a history of growth and achievement, of men who played a vital part in that growth, a reaffirmation of industry's role in the American Scene.

Perhaps this is the time for us to pause and ask ourselves how we came to this point in our history. I believe it is, and I am not alone in that thought. Within the past few months Dr. Horace H. Hopkins interjected a comment into a luncheon discussion of the early years of Du Pont's entry into the paint business, expressing a desire to see a history of our growth recorded. Later, Mr. J. Warren Kinsman, in preparing a report for the Executive Committee, wanted some information regarding the histories of certain buildings within Finishes plants acquired by Du Pont through purchase. He added his recommendation to Dr. Hopkins' earlier remark, and suggested that perhaps I might be the historian.

I make no pretense of being an H. G. Wells or Emil Ludwig. However, I have assembled all of the available facts and dates, and, taxing the memories of several of my associates, have thus been able to piece together a story I believe tells fairly the history of Du Pont in the paint business.

I could not begin this story without first extending my sincere thanks to the associates whose help has been invaluable in making this task easier:

A. K. Burke

M. J. Callahan

C. W. Clark

E. G. Daugherty

M. Denning

H. E. Eastlack

J. T. Edgerly

E. J. Furst

Dr. G. C. Given

S. L. Johnston

H. E. Lackey

H. Longstreth

R. A. Macfarlan

John Marshall

H. E. Monk

J. J. Moosmann

G. W. Sherin

J. D. Shiels

S. B. Woodbridge.

The list, I know, should be longer.

If any errors appear in the following, they do so inadvertently. I accept the responsibility for their presence, and offer my apologies.

WMZ*MS

May 1, 1947

W. M. ZINTL.

W M Zintl

COMPANY STATUS AT TIME OF DU PONT ENTRY IN THE PAINT BUSINESS:

The general belief prevails that Du Pont entered the Paint business as a postwar development and that it came about coincidental with the Company's purchase of Harrison Brothers & Company who were manufacturing certain important chemicals which Du Pont needed during World War I. But that is not so. Du Pont was in the Paint business many years before, but few in the Du Pont Company, and no one else in the industry, recognized Du Pont as being part of the Paint industry. The fact is that Du Pont had been making and selling Lacquers for quite a few years, but Du Pont was not recognized as a paint manufacturer because it was not until the development of "Duco" that the manufacture and sale of lacquer was regarded as part of the Paint industry. Prior to the development of "Duco", Nitrocellulose Lacquer (which should not be confused with the entirely different Chinese lacquer) was used primarily for soap dishes, toys and light metal work, such as silverware and brass hardware, chandeliers and beds; also as a "bronzing liquid" for radiators. Its broad use had not been commercialized because the high viscosity lacquers then available required an excessive amount of thinning for spray application. Hence, a large number of coats were necessary to obtain satisfactory film thickness. Uses were, therefore, confined largely to small articles that could be dipped - its use on brass bed-steads being a notable exception. Right here, it should be emphasized, and probably printed in bold letters, that with the development of Du Pont "Duco", making Lacquer commercially economical for large surfaces, the Paint industry was transformed from an orthodox industry into the beginning of a chemical and highly technical industry. This sensational contribution was the first real technical advance in paint technology in decades. More will follow about the development of "Duco" under a separate section.

Having thus established the fact that Du Pont was in the Paint

business before they acquired Harrison Brothers, we will now proceed with the history of each company acquired or developed, starting with Parlin.

PARLIN

Thirteen years before World War I -- to be specific, in 1902, Du Pont established the Eastern Laboratory to expand research in explosives. In 1903, the Experimental Station and Development Department were established and a definite policy was inaugurated that henceforth the Company was to be not a producer of explosives alone, but a chemical manufacturer ready to venture into any logical chemical field.

The development and manufacture of explosives had been based on the ingredients necessary for black powder, dynamite and gelatin, and smokeless powder and gun cotton. The general use of black powder had been pretty much superseded by dynamite. These products involved the use of nitroglycerine, nitrocotton, wood pulp, or cellulose, sodium nitrate, ammonium nitrate, fulminate of mercury, diphenylamine and other chemicals. There was at that time perhaps no other branch of the chemical industry which involved so much fundamental chemistry, and which required so much chemical ingenuity in the application of these fundamentals to produce a safe and economical explosive, not only for military use, but for industrial peace-time use, on which the greatest emphasis was placed.

The production of these explosives required the obtaining and preparation of specified raw materials, and involved one of the most important reactions known to organic chemistry - that of nitration. Glycerine was nitrated to obtain nitroglycerine, and cellulose was nitrated to obtain nitrocellulose or gun cotton. These operations required nitric and sulphuric acids, two chemical commodities on which a very large part of our chemical industry is based. Both were manufactured by Du Pont. The manufacture of smokeless powder required organic solvents, such as alcohol and ether, all requiring a highly specialized knowledge of the

chemistry involved.

With this as a foundation, Du Pont set out to explore the diverse fields related to explosives.

Solutions of nitrocellulose were being used in the manufacture of lacquers for coating metal hardware and light fixtures. This subject was investigated by the Development Department, (organized in 1903), and upon their recommendation, the International Smokeless Powder & Chemical Co. at Parlin was purchased by Du Pont in 1904. This company produced not only nitrocellulose for powder, but nitrocellulose solutions and solvents, and did a thriving little business with "brass lacquer". This acquisition brought to Du Pont some excellent chemists as well as other trained personnel.

Records disclose that the Parlin buildings were started in 1898 and that by 1899 there was a total of 59 buildings covering different operations. In 1900, the first Pot Nitrating House was built as was also the first Powder Line. In 1901 they had the first run of powder and began the manufacture of nitrocellulose solutions. Records show that the first sales were to the Petrifoid Company. Later, nitrocellulose was wetted with benzene and used for Artificial Leather Coatings. In 1904, they began the manufacture of solvents (amyl acetate and ethyl acetate). This was the year that the plant was acquired by the Du Pont Company. By 1905, they had a total of 133 buildings, and in this year the Pyroxylin Line was developed, including the Tank Mixing House, Tank Storage House, and Barrel Rolling Houses Nos. 1 and 2.

In 1905 they made their first lacquers for brass and silver coatings. During this year part of the present Administration building was built. In 1906, additional land was bought and more buildings erected which added up to a total of 155 by this time. In 1907, the American Lacquer Company and Miller Company were acquired. By 1908 there were

approximately 150 people employed, and in the revision and readjustment of the plant they had about 100 buildings, 16 of which were in the Pyroxylin Area. In 1910, the manufacture of ether for medicinal purposes and of barium nitrate was started. In 1915, the Arlington Company was acquired. This company was an aggressive manufacturer of pyroxylin plastics, lacquers and enamels (this is further proof that Du Pont was definitely in the Paint industry before they acquired Harrison Brothers & Company). At the time the Arlington business was acquired, they were manufacturing a line known as Pyralin Enamels, which consisted of incorporating pigment into a nitrocellulose plastic on 2-roll rubber mills, and compounding with solvents, resins and plasticizers. This part of Arlington's business was transferred to Parlin and the first pigmented enamels were turned out by Parlin at that time, the enamels being used for spraying and dipping small metallic and wooden articles.

The use of Pyralin Enamels found limited application in industry, because of their high cost and the fact that nitrocellulose imparted such high viscosity to the solutions that it was only possible to have a very small amount of solids in these enamels, the balance of the composition being volatile solvents lost during application. Parenthetically we might add here that this period was the real beginning of our Industrial Finish business.

Somewhere around this period the Company bought a Bronze Powder business to stimulate the sale of lacquers. In 1918, a number of small package items were manufactured and sold, including such items as a leather renovator, Parloidion, Aluminum Paint, and Pontoklene. During the same year there was active promotion of sales of Wood Lacquer, Spray and Dip Lacquer, Silver Lac, White Enamel Pyralin Enamels, Bronzing Liquid, Belt Cement, Leather Solution, Aeroplane Dope and Cotton Solutions. Also in 1920, the magic formula of "Duco" was developed, but more about this

later.

It is worth while recording here that several men got their real start in the Du Pont Company at Parlin and later rose to high executive positions. Notably were Mr. H. Fletcher Brown, who was General Superintendent of the Plant, Mr. J. W. Elms who was transferred from the Old Hickory Powder Plant to become Division Manager at Parlin, and later Assistant General Manager of the Fabrics & Finishes Division. Also, Mr. J. J. Moosmann who was the first lacquer salesman we had, later became Division Manager of the Parlin Plant and later moved to Wilmington as Assistant General Manager, succeeding Mr. Elms. Mr. E. M. Flaherty, the inventor of "Duco", started as a chemist at Parlin and later became Manager of the Finishes Division.

PURCHASE OF HARRISON BROS. & CO., INC.
PAINT AND VARNISH MANUFACTURERS

On August 22, 1916, the Executive Committee passed the following resolution:

> "RESOLVED, that the Development Department be informed that, provided a complete study demonstrates the fact that a satisfactory return on the investment can be secured, the Executive Committee would favor the development of the paint and varnish industry, preferably by the acquisition or purchase of one or more suitable going concerns."

As a result of the resolution, a thorough investigation of the industry was made and it was determined that Harrison Brothers was by far the most satisfactory concern to purchase. Dr. Fin Sparre and Mr. C. A. Meade who conducted the study said at the time "that while the estimated return on this investment is not large it will put us in a position to build up a very satisfactory paint and varnish business in connection with our other chemical business." They further added "there is one thing interesting in a combination chemical, paint and varnish business in that it is a well-known fact that when business is not good the paint and varnish business is thriving, caused by the railroads and factories in boom times being too busy to do their repair work." From the foregoing, it is evident that while Du Pont was looking to new postwar markets for expansion, the chemical end of the Harrison Brothers' business did have its advantages because they needed the chemical capacity of several important acids but that the paint business offered real potential.

In the same report, there was a second recommendation, viz: that the preferable plan for securing satisfactory entrance into the paint business would be "to acquire by purchase one or more suitable going concerns, if obtainable at figures indicating a proper return on the investment, and with a view to transfer of operations to Parlin at the first opportune time." The consolidation of numerous small paint manufacturers was seriously considered, but the introduction of the anti-trust laws

apparently discouraged further effort with the result that the 1914 census showed 855 establishments in the paint and varnish business, amounting to about $149,000,000 per year, as against 863 establishments in 1909 doing a business of $127,000,000. These figures are cited specifically right here because they will have special significance when the results of later years will show the progress made both by the industry as well as Du Pont.

In December, 1916, the Executive Committee authorized the purchase of Harrison Brothers, and the purchase was consummated on March 14, 1917 at a price of $5,700,000, plus the Du Pont Company assuming all the outstanding obligations of Harrison Brothers & Company.

The sale was considered satisfactory to both parties and it marked the union of two of the oldest and best-known manufacturing firms in the country. Harrison Brothers & Company were founded in 1793, nine years before E. I. du Pont built the first powder mill on the Brandywine, and in many respects both firms had a great deal in common in that they were early American industrial pioneers.

John Harrison was the first manufacturer of sulphuric acid in the United States. It is also claimed that Harrison were one of the first manufacturers of White Lead, having started in 1806. Another first to Harrison's credit was the introduction in 1814 of platinum as a catalyst in sulphuric acid manufacture, a real step forward in the production of this commodity.

The Harrison business started in Kensington, a small suburb of Philadelphia, but early in 1800 moved to Gray's Ferry Road, Philadelphia, on the East bank of the Schuylkill River. There is no record of how much ground was originally bought but at the time of Du Pont's acquisition, there were over 80 buildings occupying 40 acres. The early years of Harrison were confined to making heavy chemicals, such as sulphuric, nitric and hydrochloric acids, chromates and alum, and building after

building was added but apparently with little scientific or engineering aid. Therefore, the plant was not very skillfully laid out for mass production. Fortunately, as the business developed they kept the chemical end on the West side of the plant, and established the lead, paint, color, varnish and lithopone business on the East side of the plant which did separate the chemical section from the paint section.

The Harrison business was primarily a family affair (like Du Pont) right on up to the time of Du Pont's acquisition. There is little to be found in the records about the older generation but when in 1877 the founder's grandsons, John, Thomas S. and George L. succeeded to the business, the Harrison family was wealthy and socially prominent, while the company was recognized as a highly reputable leader in the chemical and finishes field. The three brothers are remembered as markedly different types of individuals. John was austere and aristocratic. George could be found more often than not perched on a box observing a plant operation or in conversation with a member of the operating crew. Thomas S. was glamorous, and one-time consul to Turkey, and was the recipient of a pair of Arabian steeds from the Khedive upon his retirement from that office. He was regarded as a "real sport".

Toward the end of the century, difficulties loomed ahead and in 1898 the company was reorganized and refinanced at which time the name of the firm was changed from Harrison Brothers to Harrison Brothers & Company, Inc. At this time, John Harrison was President, and C. Leland Harrison became Secretary and Treasurer, but shortly afterwards more financial trouble arose and in 1902 Lee Higginson Corporation of Boston sponsored a bond issue and established Robert S. Perry as President. Robert S. Perry was a chemical engineer, possessed of an abundant amount of aggression and drive, but shortly afterwards, (in 1903), Russell S. Hubbard (brother-in-law of Mr. Perry) was installed as Secretary and

Treasurer by Lee Higginson. Mr. Perry had the vision but not the balance. Mr. Hubbard, fortunately, had both. Mr. Perry made one contribution to the Paint industry for which he will forever be remembered. It was through his vision that the Scientific Section of the Paint Association was established, and a complete story of his contribution is recorded in George B. Heckles' History of the Paint Industry. It should be said here that this Division of the Paint industry had a great deal to do with making the industry technically conscious.

At the time Du Pont acquired Harrison Brothers & Company, their total sales of lead, paint, varnish, colors and other paint products totaled $2,102,000, of which $1,190,000 was Paint and Varnish. On sheet "A" (attached) is a detail of comparative sales from 1909 to 1916, inclusive.

The business was primarily all Trade Sales. While they were termed a national house, because of having some distribution scattered throughout the country, they were primarily a sectional house with the most of their business along the Eastern Coast. They had some of the finest paint retailers as customers and these served as a basis for the later development of Du Pont's Trade Sales business.

The Management of the Harrison Company at that time was:

R. S. Hubbard, President
Wm. Richter, Treasurer
J. E. Hatt, Manager of Paint Sales
A. R. Glancy, Plant Manager
E. C. Thompson, Asst. Plant Mgr.
P. S. Tilden, Mgr. of Heavy Chemicals & Pigments Sales.

Of the aforementioned group, Messrs. Richter, Hatt and Thompson all had important roles in the Du Pont Company.

While little reference has been made to the pigment end of the Harrison business, it is only right to say that this part of the business was the foundation for the later development and growth of Du Pont's Pigment and Color Division, but it was not felt that space should be taken up for

discussion of this in this document. In addition to the Gray's Ferry Plant, Harrison brothers also owned a small plant in Chicago which was of very little value because of its smallness and antiquity. At that plant the manufacturing operations were carried out at 2001 Mendel Street, but all products made were trucked to an outside warehouse for labeling, packing and shipping. Raw materials had to be stored in another property which will illustrate the smallness of the Chicago Plant.

To summarize the purchase of Harrison Brothers, the following is quoted from the Committee's recommendation:

"I. Immediate entrance is secured to the paint business which will allow us to acquire thorough familiarity with the industry before we are ready for expansion at our own locations.

II. Harrison Bros. & Co. can give us the best general knowledge procurable by the purchase of a going concern.

III. The chemical features of the business harmonize with several of our plans for future development.

IV. If Harrison Bros. & Co. are not purchased now their planned extensions will, by another year, render the proposition of but little value to us, at least from the standpoint of chemical manufacture.

V. Purchase of Harrison Bros. & Co. will remove what undoubtedly will be in a short time a powerful factor in the paint trade, and a very possible competitor in chemical lines we may desire to take up.

VI. The size of the proposition does not appear out of proportion to developments possible in the next few years at our own plants.

VII. The situation at Gray's Ferry is now being adjusted, and may be more carefully fitted for the most advantageous manufacture at that point while chemical manufacture expansion desired may be carried on at our own plants, probably Hopewell.

VIII. The sites at Gray's Ferry and Paulsboro are valuable, and undoubtedly salable if future development makes removal desirable."

gmc 1401

PARLIN PLANT -- MAJOR IMPROVEMENTS SINCE 1924

1924 - The original facilities, providing 240,000 gallons annual "Duco" capacity, for an estimated 240,000 automobiles, were completed in April, 1924 at a cost of $151,000. This comprised a 2-story grinding building known as #7 Mill House, and a 2-story finished product building known as #1 "Duco".

1924 - The "Duco" facilities were doubled by expansion completed in December, 1924 at a cost of $199,000. This included added acetylation and refining equipment in the Solvent Area, additional ball mills and a new manufacturing building, #2 "Duco", a new thinner manufacturing building, a new barrel and drum cleaning building, and a PXC process building.

1925 - A new Control Laboratory was completed in January, 1925, costing $47,000, to provide testing facilities for an estimated 100,000 gallons per month production of "Duco" Enamel and Thinner.

1925 - The original bay of the present Shipping House was completed in July, 1925 at a cost of $50,000. This represents the first dismantling of the old World War I Hopewell Cotton Storages. It provided new packing and shipping facilities for the above items.

1925 - A new Change House was provided in Mixture Area, and added Solvent and PXC facilities were installed in September, 1925 at a cost of $93,000 to increase "Duco", Enamel and Thinner capacity from 100,000 to 130,000 gallons monthly.

1926 - The first construction to house Clear "Duco" manufacture was completed in October, 1926 at a cost of $132,000 and consisted of a new 3-story building, now known as #3 "Duco" and a new 3-story combined doping solution and shading facilities, known as the Dope Shed locally.

1927 - A new building was completed in February, 1927 at a cost of $43,000, and equipped with portable mixing equipment to produce 12,000 gallons of Brush "Duco" monthly. Subsequently, Brush "Duco" was formulated on an alkyd basis and these facilities were not used for this purpose. The portable equipment was transferred into the "Duco" operations for small order business. The building now houses the 3,000 gallon Clear mixers.

1927 - Emergency grinding facilities, as a protection to our customers in case of damage to (#7 Mill House), pigment grinding building, were completed in July, 1927 at a cost of $49,000.

1928 - The second 50' x 100' bay of the Mixture Area Raw Material Warehouse was completed in February, 1928 at a cost of $22,000.

PARLIN PLANT - MAJOR IMPROVEMENTS SINCE 1924, continued

1928 - A 51' x 57' Research and Development Laboratory was completed in April, 1928 at a cost of $42,000.

1930 - The third bay of the Mixture Area Raw Material Warehouse was completed in October, 1930 at a cost of $27,000.

1931 - A new Finished Product Warehouse, in the form of a drum rack storage, was completed in June, 1931 at a cost of $174,000. The dimensions of this building were 55' x 183'.

1931 - The emergency grinding facilities listed in item 8 above, were converted to house continuous conveyor cleaning machines in May, 1931 at a cost of $88,000.

1931 - Facilities for manufacturing PXP were completed in December, 1931 at a cost of $187,000.

1935 - New high pressure boiler was completed in June, 1935 at a cost of $352,000.

1936 - New facilities to manufacture 20,000 gallons of urea formaldehyde resin monthly were completed in September, 1936 at a cost of $102,000.

1937 - New facilities for dispersion of pulp pigments by vacuum W. & P. mixers was placed in operation in April, 1937. These cost $49,000.

SHEET "A"

COMPARATIVE SALES - H. B. & CO., INC.

	1909	1910	1911	1912	1913	1914		
Lead Prods.	306358.36	334766.50	292344.75	408645.47	458297.48	69458.54	Chgo.	
						340530.38	Phila.	4
						409988.92		5
Paint & Varnish	962968.04	895765.27	895446.11	977672.18	1086921.18	301660.60		2
						683892.60		6
						985553.20		9
Color Making	62738.18	94872.80	102346.73	112416.86		17553.31		
						94803.51		
						112356.82		1
Alumina Hyd.						2042.10		
						14719.78		
						16761.88		
Paint Total	1332064.58	1325404.57	1290137.59	1498734.51	1545218.66	1524660.82		15

PHILADELPHIA PLANT - MAJOR IMPROVEMENTS SINCE 1926

1926 - Brush "Duco"
Several manufacturing units for the preparation and packaging were installed.

1929 - Varnish Plant
A complete and modern open-kettle varnish manufacturing plant including all necessary processing and storage facilities was constructed.

1931 - Synthetic Resin Plant
Equipment of the most modern type was installed and production started in the bulk manufacture of synthetic resins used in "Dulux" Products.

1932 - "Dulux" Manufacturing Plant
A new three story structure with complete equipment for manufacture of pigmented "Dulux" Enamels was provided.

1936 - Addition to "Dulux" Building
A two-story annex was added to the "Dulux" plant to provide space for manufacture of small batch items and additional warehousing space.

1937 - Paint Plant
A modern 3-1/2 story building with facilities for the manufacture of Orthodox Finishes, Oil Colors, Stencil Paste and Putties was erected and put into operation.

1937 - Office Building
A modern L shaped two story office building was erected to replace the old structure. This building was a combined project of the Finishes and Grasselli Departments.

1940 - Warehousing & Shipping
A completely conveyorized method of handling Finishes Products from the Operating Buildings to the Warehousing and Shipping points was installed.

1940 - Solution Method of Resin Manufacture
Equipment, incorporating the latest developments in synthetic resin processing, was added to the existing Resin Plant.

PURCHASE OF BRIDGEPORT WOOD FINISHING COMPANY

At the time of purchase of Harrison Brothers & Co., Inc., the Development Department made it clear that Harrison Brothers had a good foundation for the development of a substantial business in pigments, colors, paints and varnishes, but it was explained at that time that the Harrison management had permitted the mixed paint and varnish business, especially, to run down. It was also realized that the bulk of the Harrison Paint business was primarily mixed paint and that it would be necessary to supplement and develop the business with one or more Companies with other types of business, such as Specialties, Industrial Paints and Varnishes. So, in keeping with their study, the Bridgeport Wood Finishing Company business seemed to offer the type of business that would be advisable to buy, because while Bridgeport's ready-mixed Paint business supplemented the Harrison trade sales line, the Bridgeport Company had a line of specialties such as Fillers and Stains on which they had established some volume and reputation.

The Bridgeport Wood Finishing Company business began as the result of a friendship between Dr. David Breinig, who was a physician, and Mr. Nathaniel Wheeler of the Wheeler & Wilson Company, manufacturers of sewing machines and cabinets in Bridgeport, Conn. Because the Wheeler & Wilson Company were makers of cabinets for their sewing machines, they naturally had to have fillers and varnishes and before the special Paste Wood Filler (later known as Wheeler's Paste Wood Filler) was invented by Dr. Breinig, it was the practice of cabinet makers to apply many successive coats of shellac-varnish or gum varnish in order to obtain a smooth finished surface, free of pits. This was a laborious and expensive finishing system because much of the hard wood used for cabinets was open grain, such as oak and mahogany. It

so happened that Dr. Breinig was interested in a quartz mine located at Fort Anne, N. Y. and when he learned of Mr. Wheeler's finishing problem, he conceived the idea of combining oil and finely ground quartz to produce a substance which could be packed into the pore of the wood, thus producing a smooth, hard, impervious surface which would provide a perfect foundation for one or more coats of varnish.

For a period of many months, Dr. Breinig carried on a number of experiments and finally produced a satisfactory product which he later named "Wheeler's Paste Wood Filler". He applied for and received a patent on this product which it is believed was granted in the year 1879.

The Wheeler & Wilson Company soon found that by the use of this paste wood filler, it was possible to produce a better finish on their cabinets at a much lower cost. Recognizing the commercial value of the product, the Bridgeport Wood Finishing Company was then organized for the purpose of producing and selling to other cabinet makers, Wheeler's Paste Wood Filler and other wood finishing materials.

At that time, in the early '80's, Dr. David Breinig who was still active in the practice of medicine, turned the responsibility of organizing the Bridgeport Company over to his son, Granville M. Breinig, and their first factory was located in New York City, on Pearl Street. There, in a small building, they produced limited quantities of Wheeler's Paste Wood Filler. The business prospered, and shortly after the company developed and manufactured oil and water stains which later became known as Breinig's Oil Stain and Breinig's Water Stain. The business soon outgrew its small quarters and it was decided to build a new manufacturing plant in Still River, Connecticut, where there was an available water power site and where the immediate surrounding country showed outcroppings of quartz deposits. This was

about 1882. Its main operation at that time was the grinding of quartz into very fine grades of silica which later was given the trade name "Lithowhite Silex". This material was not only used in the manufacture of paste filler but was also used in another paint product developed at that time under the trade name "Breinig's Lithogen Silicate Paint". The pigment portion of this paint consisted of one-third lead, one-third zinc and one-third silex. About the same time scouring soaps were becoming more widely used, and Enoch Morgan & Sons, manufacturers of Sapolio, became interested in the use of silex in both the hand Sapolio cake and the scouring Sapolio cake. In the early '90's, Enoch Morgan & Sons acquired a financial interest in the Bridgeport Wood Finishing Company in order to insure a continuous supply of silex. During the years that followed, many other paint products were developed and produced, including Wheeler's Liquid Wood Filler, Primer, Japan, Drier and Varnish Stains. In the year 1893, at the World's Fair in Chicago, Wheeler's Paste Wood Filler and Breinig's Lithogen Silicate Paste Paint were given blue ribbons, representing the highest award. The business (while small) kept on growing and as the result of constant sales promotion, architects throughout the United States and Canada were specifying Wheeler's Paste Wood Filler and Breinig's Stains for practically all upright trim. Furniture manufacturers generally used the same products in their finishing departments, and eventually both products became well-known to painters and decorators with whom the firm became quite prominent.

Granville M. Breinig died in 1906, at which time his son, David E. Breinig, who started with the company as a chemist following his graduation from Yale, succeeded to the presidency of the company. Being young, progressive, and somewhat visionary he decided to expand the business and began marketing a complete line of trade sales products

under the trade name "Bridgeport Standard".

As stated previously, the Du Pont Company found it necessary to broaden the line made by the old Harrison Company and Du Pont was attracted to Bridgeport chiefly because of their Filler, Stain and Varnish business. Du Pont was not interested in the Bridgeport plant because they had ample manufacturing facilities at the Harrison Plant, and the principal asset of the Bridgeport Company was their business for fillers, stains and varnishes, and more particularly for their reputation with the architects and lumber companies throughout the country.

An outstanding merchandising asset which Bridgeport had was their system of display racks showing the effects of their fillers, stains and varnishes on various types of woods. Mr. David Breinig was apparently the first to realize that there had not been any cooperation between the paint and varnish manufacturers with producers of lumber and the users of lumber. His idea was to make a special study of the wood finishing materials as applied to each particular kind of wood and bring this jointly to the attention of the lumber associations, architects, builders, and home owners. After considerable effort the plan was developed successfully and the lumber associations cooperated, they themselves spending a large amount of money in advertising lumber for various purposes, and the Bridgeport Company supplied the display panels showing the effects that could be produced. This one feature alone possessed a tangible good-will value because the Bridgeport Company promoted the idea and furnished the panels, and displays were established throughout the country at a minimum cost to the Bridgeport Company, but with considerable advertising value. The following is a quotation from Mr. John E. Hatt's report of April 23, 1917, which is self-explanatory:

"I learned from him, too, his selling plan, which covers close work with the National Lumber Manufacturing Association and the various individual associations, such as the Pine Association, the Cypress Association and the Hemlock Association, that go to make up this National Association. Each of these lumber associations has been advertising to the public, the architects, builders, engineers, etc., the benefit of using their particular kind of wood, and as a result they are getting a great many inquiries regarding their particular product. Inasmuch as it is not advisable to show the lumber in its raw state to anyone who is interested in using it for a home or a building of any kind, the associations have made an arrangement with Mr. Breinig whereby he furnishes them small finished samples, color cards, booklets, and standard specifications for finishing each kind of wood to get certain desired results, and these leaflets and color cards the associations are distributing direct to the person who inquires, and then the association also turns over to the Bridgeport Company the inquiry itself. This inquiry, in turn, is followed by the Bridgeport Co. and advices regarding the inquiry and what they are interested in, is turned over to the local jobber or dealer in the vicinity in which the inquiry originates, and advice is given to the inquirer that he can see displays of various woods finished in the manner in which he is interested at some certain jobber's or dealer's store. In other words, in connection with the Bridgeport Company the Lumber Associations are offering a lumber service for finishing to people who are interested in their product. Naturally, this appeals to the architects and builders rather strongly and because of the inquiries which it originates it likewise appeals to the lumber dealers in the smaller communities, and this has made it fairly easy, with the large number of inquiries which the Bridgeport Company is getting from these Lumber Associations, to interest Lumber Dealers and Jobbers in various sections. It also has given them quite a little standing with the architects and has enabled them to interest the dealers from the point of furnishing a room properly fitted up in attractive form, in which to display the rather elaborate exhibits of the Bridgeport Company, to which they direct architects and prospective buyers of Stains, Fillers, Varnishes, etc., as a result of the inquiry to the lumber association. The Bridgeport idea has been to make these inquiries on Stains, Fillers, Varnishes and Finishes of the various kind, carry with them to the jobber and dealer the sale of their House Paint and Flat Finishes also, and I should think it would be quite a leverage to have such an arrangement with the building interests. To work this out in detail it has been necessary to establish elaborate display rooms in New York and Chicago in connection with the Lumber Association and most of that expense is past. The cost of course of finishing these rather elaborate samples amounts to rather considerable in a year.

"The Bridgeport people have a similar arrangement with the Morgan Door Co. of Chicago, who are one of the manufacturers of doors who advertise nationally and they likewise show and recommend the Bridgeport Finishing for the finishing of their doors so as to assure a satisfactory service.

"There is unquestionably a certain established good will and value here, and in addition to this I feel there is considerable possibility in the way of future sales and increased sales and architectural specifications in connection with these lumber associations."

Following a thorough review of all the foregoing facts, the Development Department Committee concluded that advantage should be taken of the national position of the Bridgeport Company, and recommended the purchase of the business, including inventory, movable machinery, good accounts and trade names, as well as the services of Mr. Breinig whose services were considered essential. The purchase price approximated $300,000 and the deal was consummated on December 1, 1917.

The plant was not acquired because the location was undesirable and Du Pont already had ample production facilities which they wanted to utilize.

On the attached exhibit are the sales for five years - 1912 to 1916 - and also for the first four months of 1917. As will be seen, the volume was not large and more regrettably the type of business did not survive because changes in finishing styles occurred shortly afterwards and stained effects were replaced by solid colors in flat, gloss and semi-gloss; and this good-will asset disappeared quickly. David Breinig and his brother, Granville Breinig, left after a short period and later organized another firm which is still operating under the name of "Breinig Bros.", but neither brother is associated with the firm.

PAINT & VARNISH SALES -
BRIDGEPORT WOOD FINISHING COMPANY,
STILL RIVER, CONN.

	1917	1916
January	$ 66,187.70	$50,328.23
February	69,209.48	61,672.47
March	77,947.73	66,847.85
April	70,576.83	59,524.03
	$283,921.74	$238,372.58

	Sales	Net Earnings
1912	$503,671.24	$ 30,369.48
1913	441,064.58	38,681.31
1914	475,836.25	4,909.51
1915	504,429.88	9,264.68
1916	575,763.97	5,860.99

FLINT VARNISH AND COLOR WORKS

The purchase of this business and plant is probably the most interesting of all the acquisitions, because it not only possessed good equipment but also a good substantial type of Industrial, Railroad and Automotive business as well. It was an important unit in helping Du Pont get established in the automobile industry and was very advantageously located and extraordinarily useful following the development of "Duco".

The business was purchased in May, 1918. At the time, Du Pont acquired approximately 70% of the common stock and 75% of the preferred stock of the Flint Varnish & Color Works and 80% of the Canadian Flint Varnish & Color Works, for which Du Pont paid $1,394,528. As stated before, this purchase also included the Canadian plant and business of this Company which was later sold to C. I. L. in September, 1919, for $348,625.

The principal stockholders at the time of purchase were: John N. Willys, President of the Willys-Overland Company, W. C. Durant, President of General Motors and Chevrolet Motor Co., C. W. Nash, President of the Nash Motor Car Company, J. D. Dort of the Dort Motor Company, and Mr. W. W. Mountain.

The development of this business is worth mentioning:

In 1886, W. C. Durant became the owner of a patent on a road cart, and he invited Mr. J. D. Dort to join him in the manufacturing venture, which eventuated in the largest manufacturing institution in the City of Flint, - The Durant-Dort Carriage Company. This establishment made Flint famous as the vehicle city, and as a more or less natural outgrowth of the Durant-Dort interests, the following establishments were started as departments of the Carriage Company: the Diamond Buggy Company, The Webster Vehicle Company, the Flint Axle Works, and the Imperial Wheel Company. Naturally, the development of the carriage

business demanded the use of colors and varnishes, and the present-day Flint Plant first came into existence as a separate entity in 1901. In order to keep the Varnish business separate from the Carriage Company, it was named the Flint Varnish Company, the purpose of this being to supply other vehicle manufacturers over and above their own requirements. Their first varnish maker was Albert Kratz who acquired his trade in Newark, N. J. where there were a number of older varnish houses established. Mr. Kratz supervised the construction of the new plant, which reflected his own ideas of a modern varnish plant. As mentioned in the section on the purchase of the New England Oil, Paint & Varnish Company, all varnish makers carried all their formulas "under their hat".

As the business grew, the company felt the need of a sales manager, and this helped in the expansion of the business, and from a small beginning of ten people the number of employees kept growing.

In 1909, Mr. W. W. Mountain was engaged to become General Manager and under Mr. Mountain's direction the business grew very rapidly. Mr. Mountain had been affiliated with the Sherwin-Williams Company and one of his first recommendations was the construction of a new building for additional varnish fires. This was begun and the building completed in 1910. Shortly after this the Varnish Works branched out into the Paint field. This was accomplished by purchasing from the Buick Motor Company its paint-making equipment, which consisted principally of buhrstone mills. The equipment was moved from the Buick plant to the first floor of the present paint building. Following this, the plant began to produce high quality automotive and railroad coach finishes in addition to the varnish line.

In November, 1909, the Durant-Dort Carriage Company decided to sell and convey to the Flint Varnish Works all of the equipment, buildings and furnishings, which completely separated the Flint Varnish

Works from the Durant-Dort Carriage Company. Because of the continued growth of the business, Mr. Mountain was made President in November, 1913, succeeding Mr. J. D. Dort who had been President since the Varnish Works started in 1901, and in August, 1915, an announcement was made that the plant would double its capacity by the addition of four new buildings and that the force of 150 persons would be increased to 300 when the buildings were completed. In March, 1916, Mr. Mountain announced the acquisition of a branch of the Flint Varnish Works in Canada, known as the Flint Varnish & Color Works Limited. This plant was purchased from W. C. Durant. Also in March, 1916, the Company completed large additions to the plant and it was said at that time that they were the biggest concern in the world engaged in the manufacture of high-grade automotive and railroad coach finishes. The business kept growing and it was on May 2, 1918 that announcement was made that E. I. du Pont de Nemours & Company had purchased a large interest in the Flint Varnish Works and the subsidiary plant in Toronto, Canada. The sales for the years 1913 to and including 1917, as well as the net profits for the same period, are listed below:

	Net Sales	Net Profit	% of Sales
1913 (17 mos.)	$743,122.10	$102,485.39	13.8%
1914 (12 mos.)	612,106.25	135,805.91	21.9
1915	998,467.74	256,986.26	25.7
1916	1,472,108.33	397,795.51	27.0
1917	1,927,480.03	413,207.69	21.4
1917		276,686.09	14.4 (after deducting reserve for Federal taxes)

The following is a breakdown of these sales, by industry:

	VARNISHES		ENAMELS, COLORS, etc.		TOTAL	TOTAL
	1916	1917	1916	1917	1916	1917
Railroad	$116,184	$92,016	$203,900	$185,125	$320,084	$277,141
Trade	32,740	33,851	29,928	32,640	62,668	66,491
Manufacturing	268,042	376,739	838,523	1,219,965	1,106,565	1,596,704
	$416,966	$502,606	$1,072,351	$1,437,730	$1,489,317	$1,940,336
Detail of Manufacturing Portion						
Willys	96,577	112,416	264,761	307,936	361,338	420,352
Buick	62,720	98,857	300,848	392,557	363,568	491,414
Chevrolet	33,230	38,926	84,588	217,367	117,818	256,293
General Motors	25,756	63,394	61,834	94,204	87,590	157,598
Dort Motor Co.	8,428	12,744	32,242	31,597	40,670	44,341
Swift & Co.	1,285	2,603	2,315	1,080	3,600	3,683
General Mfg.	35,655	42,963	80,358	155,101	116,013	198,064
City Mfg.	4,417	4,836	11,576	19,235	15,993	24,071

Mr. Mountain continued with the company for only a few months and was succeeded as President by Mr. Lammot du Pont on November 1, 1918.

For several years this business continued to operate as the Flint Varnish and Color Works (as a unit of Du Pont American Industries) and following Mr. du Pont, Mr. Hunter Grubb became President. He was assisted by Mr. W. J. Sohlinger, Mr. E. C. Thompson and Mr. W. F. Tiernan.

When the Chicago Varnish Co. was acquired that business was put under the Flint Management and this arrangement continued until 1924.

Of the personnel acquired, Walter J. Sohlinger and J. T. Edgerly were two men who stayed on with the business and succeeded to responsible positions in the Finishes Division.

FLINT PLANT - MAJOR IMPROVEMENTS SINCE 1926

DATE	PROJECT DESCRIPTION	INVESTMENT
June, 1926	Purchase and installation of 5 pebble mills for manufacture of Black "Duco" in Bldg. #19.	$ 25,330
May, 1927	Construction of "Duco" Plant for increased production of "Duco".	408,000
July, 1927	Installation of centrifuges for Lacquer Base clarification.	5,755
July, 1927	Erection of new mechanical shop and Research Laboratory.	60,500
Dec., 1927	Construction of Semi-Works Paint Testing Laboratory	6,500
July, 1928 through March, 1931	Erection of 14 ball mills in Bldg. #10 for Old Line products because of trend from stone milling to ball milling.	43,365
Sept., 1929	Rearrangement of the "Duco" Plant for increased production: (a) Move ball mills to Bldg. #46 (b) Installation of 4 1,000-gallon mixers on second floor. (c) Installation of new type 150-gallon mixers. (d) Installation of 5 1,000-gallon mixers for single pigment enamels.	160,000
Oct., 1929	Improved drum cleaning facilities.	7,500
Apr., 1930	Purchase and installation of mixers and filling machine for No. 7 Line Chemical Specialties products - (#7 Top Finish, Polish, and Touchup Black)	7,268
Feb., 1932	Purchase and installation of equipment for "Dulux" manufacture.	27,972
May, 1938	Improvement of Varnish Thinning facilities	38,000
July, 1938	Improved Drum Cleaning facilities	5,255
Sept., 1940	Purchase of two 6' x 6' ball mills for Paint.	11,400

NEW ENGLAND OIL, PAINT & VARNISH CO., EVERETT

Continuing their efforts to build a Paint Department, the Committee, which consisted of Mr. Lammot du Pont and Mr. William Coyne, on August 14, 1918, wrote the Executive Committee that they felt that the addition of the New England Oil, Paint and Varnish Company would fit right into the expansion program "and the purchase of this plant is recommended solely for the part it will play in the general plan of the Du Pont Company along Industrial Paint and Varnish Lines. The Trade Sales or Dealer business which would come by this acquisition can be handled through the Harrison and Bridgeport lines as we will take over no stock of canned goods and an opportunity is presented to make a clean-cut start of Industrial Paint manufacturing. The excess manufacturing capacity which the plant now has can be immediately utilized which, under present conditions, is of considerable value to us."

The New England Oil, Paint and Varnish Company was purchased by the Du Pont Company on September 18, 1918 for $650,000, and the plant consisted of nine buildings, some of which were old but some quite modern. The plant was located in metropolitan Boston, in the City of Everett, situated on the double track line of the Saugus Branch of the Boston & Maine Railroad. A spur track of approximately 700' enabled several freight cars to be handled so that raw materials could be received in tank cars and pumped into adequate storage tanks. The main buildings were of brick and mill construction, all sprinkled. The varnish melting, boiling and thinning rooms were of fireproof construction. The walls of the office building, while one story in height, were strong enough to hold three additional stories. Electrical power was used throughout the buildings. The plant had a total capacity of one million gallons per year. Before the New England Oil, Paint and Varnish Company acquired the Everett Plant, it was formerly known as

the Everett Foundry, in which were manufactured castings for the frames of pianos. It is believed that these buildings were built somewhere around 1865.

The sales of the New England Oil, Paint & Varnish Company from 1914 to 1917 and for six months of 1918, along with the percent of earnings of the company, based on percent of sales, are shown below:

	Volume Sales	
1914	413,888.16	7.8%
1915	436,046.15	7.3%
1916	585,097.00	10.5%
1917	658,332.00	11.5%
1918 (June 30)	384,026.10	12.3%

The principal attraction of the New England business was the fact that the volume of sales was supposed to be largely Industrial, but apparently the term Industrial then was quite different from Du Pont's interpretation of the term today, because shortly after the business was acquired, it was learned that most of the New England Industrial Sales were special products made for private companies or large volume cheap items and did not represent the substantial type of paint-on product business which they term as Industrial business today. A breakdown of the 1917 business shows the following:

Industrial	$347,705.17	53%
Trade	174,435.17	26
Boston Store	62,408.88	9.5
Not Manufactured	73,782.78	11.5
Total	$658,332.00	100.0%

Of the $658,000 total, it is interesting that the largest item was Varnish, which amounted to $328,000, or almost 50% of their total sales. Paint was only $170,000, Putty $63,000 and Raw Materials and Miscellaneous approximately $100,000.

A picture of the companies which were consolidated into the New England Oil, Paint & Varnish Company is very interesting. It really was a combination of smaller companies, the principal firms

being: The Hoffman Paint & Varnish Company, Burbank & Ryder Company, Craftsman Chemical Company, and Richardson and Bracket.

The Hoffman Company dates back to 1842 and it was a combination of smaller companies not in line of descent but rather because of changing connections and personnel.

The Burbank & Ryder business was even more interesting, and it is believed that Silas Burbank was one of the earliest varnish makers in America. It is said that this business began in 1825. Silas Burbank was one of the pioneer itinerant varnish makers whose "formulas" were carried "under his hat", and "factories" carried from place to place, perhaps in a covered wagon. He made varnish in a small copper kettle and Du Pont has somewhere in the archives the original kettle which he used. Silas Burbank and his son carried the business along until about 1877 or 1878, when Nathaniel F. Ryder joined forces and the firm name was then changed to Burbank & Ryder. Their plant was located at Charlestown, near Malden Bridge, and because this was near Bunker Hill, they sold their varnishes under the trade name "Bunker Hill Varnishes".

In 1911, Lyford A. Merrow of the Underhay Oil Company purchased the J. W. Hoffman Paint Company, and a few months later acquired the Burbank & Ryder Company. These two companies were combined under the name of the New England Oil, Paint and Varnish Company, and they moved to the Everett Plant in 1912, which is the property Du Pont acquired. At the time, this plant was regarded as one of the most modern Paint and Varnish plants in the country.

Of the personnel taken over at the time, A. H. Avery continued with the business until February 1, 1927, at which time he retired. Harry S. Chandler is now a Division Manager of Canadian Industries Limited.

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EVERETT PLANT - MAJOR IMPROVEMENTS SINCE 1919

1919 - Stain Making

Equipment installed for stain making and production started.

1919 - Warehouse

Three-story finishes products warehouse and locker room in basement.

1924 - Improved facilities of locker room.

1923 - Pebble Mill

First Pebble Mill installed.

1924 - Laboratory

Enlarged and improved.

1925 - Varnish Making

Improvements -- Stack fires changed from coke to oil burning -- Kettle sizes changed from 75, 125-gallon capacity each to 150, 300-gallon capacity.

1928 - Roller Mills

First Roller Mill installed)
Second " " ").

1937 - Both scrapped and replaced with a high-speed Lehman Mill and two, 400-gallon mixer tanks.

1938 - Change Can Cleaning

Improvements at No. 3 Building by the installation of a booth and pumps.

1938 - Varnish Storage

Increased capacity and improved safety conditions by removing the tin plated and soldered tanks of 300 and 600 gallon capacities and replacing them by installing 29 steel tanks of approximately 1100 gallons capacity each.

CHICAGO VARNISH COMPANY

In December, 1919, Mr. F. W. Pickard, Vice President, reported to the Executive Committee the need of additional capacity for the Flint Varnish & Color Works, the underlying reasons being:

(1) a considerable volume of General Motors business was being diverted to competitors because of the limited capacity of the Flint Plant, and

(2) the Chicago Varnish Company's plant had the type of equipment and somewhat the type of business of the Flint Company and its acquisition would provide what the Chicago Plant of the old Harrison Company could not provide.

The Chicago Varnish Company's business was unstable for several years by reason of the age and temperament of its executives. A number of the officers were quite elderly and the business was largely controlled by one family - the Morgans. It was learned that in September, 1919 the banks imposed a mortgage of $400,000 on the plant so that all the factors for a favorable purchase seemed to be ripe.

About the time that these negotiations were under discussion, the Executive Committee again reviewed the lack of progress of their paint business and concluded that they had too much money invested in the trade sales end of the business, the volume of which was not progressing satisfactorily. The sales were far below the amount of capital invested and the losses each year were getting larger. This was in comparison with the automotive and industrial type of business which the Flint Varnish & Color Works had and which was showing a consistent profit, and because the Chicago Varnish Company's type of business was somewhat similar to Flint's, it was felt that the purchase of the Chicago plant would be beneficial. It was, therefore, concluded to buy the Chicago Varnish Works and turn it over to the

management of the Flint Varnish & Color Works which at that time was running its business separately from the parent company's investment in the paint business. In April, 1920, the Flint Varnish & Color Works (subsidiary of Du Pont) purchased the Chicago Varnish Company for $992,000. One of the provisions specified was that if the Chicago Varnish Company was bought, the company should then dispose of the old Harrison plant.

The Chicago Varnish Company's plant was located at 2100 Elston Avenue, Chicago, and occupied a tract of land 306,400 sq. ft. There were 25 buildings, mostly of brick and timber construction of the "slow burning type". The plant had its own siding, served by the Chicago and Northwestern Railway. At the time the business was largely owned by the Morgan family, and the officers were as follows:

O. H. Morgan, President
R. K. Buckman, Vice President
A. C. Morgan, General Manager
W. M. Turner, Treasurer.

A. C. Morgan was the son, and R. K. Buckman the son-in-law, of O. H. Morgan, the latter being at the time of purchase 85 years of age, and was the only member of the firm who knew the manufacturing side of the paint and varnish business.

The Chicago Varnish Company was founded in the year 1865 and carried on as such until the incorporation of the company in 1883.

Their first plant, a very small one, was erected at 204 Pine Street (now Lincoln Park Blvd.) and continued there until it was destroyed by the great fire of 1871, after which it was rebuilt on the same plot. In 1888, the company was transferred to the Elston Avenue location, and in that year they erected 19 of the present buildings. This change in location seemed to be beneficial to the growth of the company, and in January, 1909, they erected the present

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office building at the Elston Avenue location, which closely resembles old Independence Hall in Philadelphia. At the time, it was one of the showplaces of Chicago and has always been greatly admired because of its Colonial architecture.

The oldest buildings in the Chicago plant are the boiler house, electrical control room, and varnish laboratory, they being the first three that were built in 1888. The next were the circular varnish stack and three small buildings. This was followed in 1890 by Building No. 5 for varnish tank storage. In 1893, Buildings Nos. 3 and 4 were erected for varnish storage. In 1898, the present mill office and locker room were built. In 1901, the second varnish stack and thinning room and Building No. 6, which now houses the laboratory, were erected. This was followed in 1906 by Building No. 12, which is at present used for warehousing raw material, finished product and shipping, and the present paint building No. 33 was erected in 1910.

While the principal type of business of this company was largely with railroads, manufacturers of agricultural implements and some automobile business, they also had a small trade sales business which was sold largely to a group of seven retail paint stores, in which they owned a controlling interest. These stores were:

Name	Location	Total Stock Issued	Owned by Chicago Varnish Co.
O'Hara Paint & Varnish Co.	Syracuse, N. Y.	$ 20,000	$ 14,000
H. F. Smith Paint & Glass Co.	Detroit, Mich.	25,400	18,000
Fitschen Paint & Varnish Co.	Baltimore, Md.	19,100	13,100
Leis-Morgan " " " "	St. Louis, Mo.	26,000	21,000
Eason Paint & Glass Co.	Nashville, Tenn.	19,500	13,000
Schaal Paint & Glass Co.	Erie, Pa.	30,000	15,600
Letton Paint & Varnish Co.	Kansas City, Mo.	19,400	15,100
		$159,400	$109,800

This is merely mentioned as a matter of interest because of what will be reported about Du Pont's own retail store development. These stores

were not taken over by the company at the time of purchase, the Morgan family retaining their interest in the stores, but to our knowledge, as this report is being written in the year 1947, none of these stores are now in existence.

On Exhibit "A", attached, are shown the net sales and profits of the Chicago Varnish Company for the years 1916, 1917, 1918, and five months of 1919.

As time moved on and with the advent of "Duco", the Chicago Varnish plant was of some assistance to the automotive sales growth, but particularly was it of benefit to the development of Du Pont's railway and trade sales business. The assets derived from this purchase were the equipment, buildings and formula knowledge of Railway Finishes - particularly Primers - and their line of Varnishes sold under the familiar "yellow label".

While their Railway products were of good quality, Du Pont had to rebuild their sales because their method of obtaining business was quite different from the principles of the Du Pont Company.

Of the personnel taken over at the time of purchase, there was no one of importance who continued in the exploitation and development of our Finishes Division.

TOLEDO, OHIO PLANT - JULY, 1934

This plant was known as the Mountain Varnish & Color Works. As mentioned in the section describing the Flint Plant, Mr. Mountain retired very suddenly after Du Pont's acquisition. He promptly went to Toledo and rebuilt almost a duplicate of the Flint layout, but modernized and streamlined it based on his experience and knowledge gained at Flint. The Mountain Varnish & Color Works was incorporated in 1919 by John N. Willys, Edward Swift and W. W. Mountain. Mr. Willys was President of the Willys-Overland Motor Company, and this account was one of the large customers of the Flint Plant. The building of the plant was started in the Fall of 1919 and production began in April, 1920, consisting primarily of body and color varnishes and fender enamels, with the Willys-Overland Company being the principal customer. In the Fall of 1925, the production of lacquers was begun.

In February, 1933, the Willys-Overland Company, which was the biggest single customer and also the largest single accounts receivable account went into receivership, which immediately placed the Mountain Varnish & Color Works in a precarious financial position. This was during the depths of the depression and while several attempts were made to refinance the business to keep it going, the Mountain Company was not able to attract other business and because of their dependency upon the Willys-Overland account they had great difficulty in meeting their obligations. All efforts to get the business back into a sound financial position were unsuccessful, with the result that the Mountain Company was also put in receivership in May, 1934, and the business was purchased by Du Pont in July, 1934, at auction, for $350,000, which included all plant buildings and accounts receivable. The purchase included 16 acres of ground, a large paint manufacturing building, power house, solvent storage facilities, laboratory machine shop, modern warehouse building

and a modern office building. In 1936 Du Pont purchased three acres on the West side of the plant and in 1938 they purchased 12 acres on the North and East sides of the plant.

There were two subsidiaries of the company, one known as Paint Engineers, Inc., which was organized to do a privately labeled Trade Sales business. The other was the M. V. C. Laboratories, which made nail polish for sale through the chain stores.

Paint Engineers was liquidated and the inventory disposed of to the concerns who had been buying from Paint Engineers.

The Nail Polish (M.V.C.) business was in chaotic disorder - obligations for enormous supplies of bottles and display cartons had to be satisfactorily compromised and after the whole sales policy was straightened out the Management concluded that Du Pont did not want to stay in the Nail Polish business and disposed of this end of the business to another large, successful nail polish manufacturer.

The buildings of this plant were all of good construction, but the equipment was so designed for manufacturing obsolete lines. Therefore, the buildings had to be completely re-equipped with modern machinery for manufacturing the newer types of finishes. The purchase of the Toledo Plant was necessary because of the rapid growth of the Finishes Division and this unit is now one of the most modern Du Pont has.

Du Pont were not able, nor were they desirous of retaining what few accounts Mountain sold because of their narrow margins and their method of "selling" the accounts.

TOLEDO PLANT - MAJOR IMPROVEMENTS SINCE 1934

1934 - 1934 and 1935 INSTALLATION OF "DULUX, RESIN AND ENAMEL EQUIPMENT

The paint manufacturing building was completely remodeled from basement to roof and modern mill and mixer equipment was installed for the manufacture of "Dulux" enamels with a capacity of 240,000 gallons per month. Two cooking kettles, thinning tanks, an inert gas unit and Dowtherm vaporizer were installed for the manufacture of "Dulux" resin with the capacity of 100,000 gallons per month.

1936 - 1936-1938 PURCHASE OF ADDITIONAL ACRES

Three acres west of the plant were purchased in 1936 and twelve acres north and east of the plant were purchased in 1938.

1938 - 1938 SOLUTION RESIN MANUFACTURE

One additional cooking kettle was installed and one of the present kettles converted in order to manufacture resin by the solution method, increasing the resin capacity to 190,000 gallons per month.

1940 - 1940 SLUDGE RECLAMATION

The necessary equipment including paste mixers, a still and filtration tanks were installed so that approximately 10,000 gallons of refrigerator enamel and primer could be reclaimed per month.

1946 - 1946 and 1947 - INCREASED LACQUER CAPACITY

Additional 1,000 gallon churns and holding tanks were installed to permit the manufacture of clear lacquers, increasing the capacity from 60,000 gallons to 115,000 gallons per month.

SOUTH SAN FRANCISCO PLANT - 1935

Having had enough evidence that acquiring existing paint plants was not of much benefit, and because of the large potential which exists on the West Coast, pressure was continually brought by the West Coast sales people to such an extent that Management was finally convinced that the way to expand on the West Coast was to have a plant of their own and to build it themselves.

In the early 30's, the West Coast office kept presenting facts, with specific prospects' names, to prove that the only way they could develop the business out there was to be able to show that Du Pont made the paints in California. This was because of the very strong sentimental (native-son) attitude of the Californians. Up to the time of establishing a plant, Du Pont's business on the West Coast was handled through warehouses and by direct shipments from Eastern plants. The warehousing system was reasonably satisfactory for such lines of business as trade and refinish, but the industrial business called for more prompt shipments than could be made from the Eastern plants. At the time, the trade and refinish business was handled through large distributors, which also relieved the warehousing burden in that the bulk of the stocks were handled through such outlets.

In 1933, the decision was reached to establish a West Coast plant. At the time, it was thought that a minimum size plant would be sufficient and the problem arose as to whether it should be located in Los Angeles or San Francisco. This involved a thorough study and on the basis of our existing business, and the potential in the West Coast district, it was concluded that because San Francisco was a more central point than Los Angeles the plant should be established in San Francisco. The first unit, located in South San Francisco, which is 12 miles south of the City of San Francisco cost about $250,000. This

was in 1935. This unit was eminently successful in retaining the few industrial accounts then sold and helped to get new ones even though the capacity was only 28,000 gallons per month.

The justification for establishing the plant soon proved itself, and during the first two years of the plant's operation, it became evident that certain Trade Sales items, notably the fast-moving Whites, could not be properly serviced, even with warehouse stocks. Parenthetically, it should be mentioned here that at this time Du Pont was selling Trade Sales accounts directly, having discontinued the large jobbing connections because of economic reasons.

About this time (1936-37) General Motors built a large unit for the making of Buick, Olds and Pontiac, in Long Beach, and to service this trade additional capacity was needed. Up to this time, goods for the Chevrolet and Fisher plants in Oakland were supplied from the East, and with the development of this automotive business and the continued growth of the entire business, it was necessary to add a second unit, costing around $400,000, which was finished in 1937. This enabled Du Pont to render better service to the Automotive Division, particularly with "Dulux" and "Duco", although Undercoats were still being supplied from the East.

During the business slump of 1938, in order to keep the plant going, it was arranged to make the refinish line in the plant, and this decision not only relieved the Eastern plants, but also converted the West Coast plant into a full fledged manufacturing unit for all types of products. From the original 28,000 gallons per month in the first unit, the plant in 1938 had a capacity of 100,000 gallons per month.

On the attached exhibit is a complete history of Du Pont's sales on the West Coast, and it is apparent that the establishment of

a plant on the West Coast was a practical and sensible move, as the sales figures clearly show.

In 1941, a third addition to the plant was made, primarily to augment and streamline the plant shipping and warehousing facilities made necessary by the expanding business. The business has continued to grow, and as this report is being written in 1947 another unit is again necessary to take care of the growth.

While this is a history of the development of the paint business, it is worthy to mention here that in all probability to take care of the future West Coast business a manufacturing unit in Southern California may be necessary.

SAN FRANCISCO SALES

Years	Industrial	Trade	Refinish	#7	
1933	$ 268,597	$ 115,141	$ 200,934	$ 56,334	$
1934	294,769	152,066	269,824	87,298	
1935	389,545	120,010	325,391	88,864	
1936	604,455	280,501	427,648	103,395	
1937	724,909	332,708	532,666	98,095	
1938	656,833	327,971	528,275	74,459	
1939	793,287	410,331	599,901	76,292	
1940	868,901	478,194	730,212	107,297	
1941	1,116,732	632,301	1,036,069	126,103	
1942	1,374,457	757,072	661,500	160,306	
1943	1,451,255	1,316,498	732,262	342,500	
1944	1,309,114	1,308,350	745,570	311,994	
1945	1,194,660	1,055,727	894,936	394,653	
1946	1,235,401	1,351,511	1,292,056	710,010	

SO. SAN FRANCISCO PLANT - MAJOR IMPROVEMENTS SINCE 1935

1935 - Construction of new plant began in September. Completed and in operation early in 1936. Major buildings - #1 "Dulux" and #2 and #3 Varnish making.

1937 - Additional facilities built during the last half of the year - Building 21 - "Duco", Raw Material Storage, Finished Product Warehouse, #22 Drum Cleaning, #24 Change House and #25 Maintenance Shop.

1940-41 - Construction started late in 1940, consisting of addition to Finished Product Warehouse; Laboratory and Office. Addition of second floor to Change House late in 1941.

1946 - Construction of Bldg. 34 Thinner Manufacturing completed. Construction of addition to Change House started.

FORT MADISON, IOWA PLANT - SEPTEMBER, 1937

With the continued growth of the Finishes business, particularly "Dulux", "Duco", and other Industrial products, production capacity was being pushed to the limit. With Philadelphia, Toledo, Flint and Chicago running day and night, it was found that much of the equipment, particularly the grinding mills, was being worn and replacements necessary. Additional facilities were not only badly needed but imminently demanded, because "Dulux" Enamel production went from a million gallons in 1933 to six million gallons in 1938, and orthodox finishes from four million gallons to eight million.

In seeking new plant facilities, the City of St. Louis was selected as a possible location from the point of view of future development, inasmuch as no Du Pont paint plants were then in existence between Chicago and San Francisco. This location was selected because it seemed to be logical to serve the Western and some of the Southwestern territories, thus relieving capacity in other plants for other territories. In searching for a location in the St. Louis district, an idle plant was found at Fort Madison, Iowa, and in early 1937, a committee, consisting of M. J. Callahan, S. L. McSorley, T. L. Riggin, S. W. Sawin and C. W. Clark, was appointed to investigate the entire situation. The plant turned out to be that of the Perfection Tire & Rubber Company, which company made tires, the largest part of their output went to the Nemours Trading Corporation. The reason the plant was available was due to the Perfection Company having gone into bankruptcy. The plant consisted of four large three-story buildings built in a rectangle, with several smaller buildings on the outside. The ground area consisted of 14 acres, enclosed with a six foot wire fence. The main buildings, consisting of two manufacturing units, each 250' x 60' connected across the front by an office section, with a 220' x 100' warehouse building

forming the rear, all steel frame and brick construction. In addition to the 14 acres within the fence, Du Pont also purchased an additional 85 acres surrounding the plant, so as to eliminate the possibility of any other industry which might be objectionable, building too closely to the plant.

The original cost of the buildings was approximately $1,250,000. Great plans were in store for the Perfection Company, but adverse business conditions began to develop in 1922, and with limited capital the company went into the hands of the receiver. The plant was idle for 15 years and the citizens of Fort Madison were anxious to have a firm of substantial reputation locate there, because the only other industrial plant was that of the Schaeffer Pen Company. The property was offered to Du Pont for $35,000. The construction of the buildings was good and because of the need of a plant in the Western section, Du Pont took the property over in 1937. While the cost of the buildings was seemingly cheap, the cost of rehabilitation turned out to be quite expensive, the first project on it asked for $860,000, and was later increased $90,000, bringing the total original expenditure up to almost one million dollars.

Fort Madison is on the West bank of the Mississippi River in the Southeastern corner of Iowa, approximately 200 miles each, West of Chicago, East of Kansas City, North of St. Louis and South of Des Moines. It is on the Santa Fe Railroad, running east and west between Chicago and Kansas City and on the Burlington Railroad running north and south between Minneapolis-St. Paul and St. Louis.

While Du Pont purchased this plant in late 1937 and made many changes, the plant really did not get into operation until 1940 due to the lull in business in 1938 and 1939, but once it got started continual additions have been made and it has developed into an important producing unit for all Divisions of the Finishes business.

FORT MADISON PLANT -- MAJOR IMPROVEMENTS

1946 - Thinner Manufacturing Building and facilities - This project was primarily to remove a hazardous operation from the heart of our paint manufacturing facilities. Work was started on February, 1946 and completed in March, 1947.

1947 - Resin Manufacturing Unit - To adequately serve a growing demand for resin containing finishes logical to this plant a Resin Unit was required. It is expected that when the unit is in operation we will be able to help the Toledo Plant supply some of the needs of the So. San Francisco, Chicago and Atlanta plants (when Atlanta is built). Work was started on November 4, 1946, and start-up date is now set for April 1, 1947.

THE BEGINNING OF DU PONT PAINT BUSINESS

There have been so many reasons given as to how and why Du Pont entered the Paint Industry. So, to avoid further controversy, the following is quoted from William Dutton's book -"Du Pont - 140 Years":

> "New capital was authorized for the purpose of effecting expansion into new industrial lines, wherein might be possible the continued employment of many of our valuable men whose services might otherwise be lost with the termination of military demands.
>
> "The Development Department was authorized to push its program of expansion beyond Explosives into the field of chemistry and the Department investigated not merely hundreds but literally thousands of businesses outside the explosives industry. This work, done under the direction of R. R. M. Carpenter, covered most of the industrial structure, parts of it in minute detail. Among the promising lines investigated were Paints, Varnishes, Pigments, Lacquers, Coated Textiles, Acid and Heavy Chemicals, Plastics and a variety of Fine Chemicals. These were only the nucleus of the company that was being built."

As covered by the foregoing facts, the first companies acquired were Harrison Brothers and Bridgeport Wood Finishing Company, Harrison being acquired late in 1917 and the Bridgeport Company in May, 1918. Negotiations were started for the purchase of Bridgeport in October, 1917, but consummation of the purchase was in May, 1918.

It being known that the Harrison business involved both Paint and Acids and Heavy Chemicals, and inasmuch as this history has to do only with the Paint business no further reference will be made to the Acids and Heavy Chemicals Division of the business.

Excepting for having been in the Lacquer business in a minor way, as referred to in the section commenting on the Parlin plant, Du Pont's real entrance into the Paint business began in 1917 with the acquisition of Harrison Brothers and the Bridgeport Company.

At the time these companies were purchased, they were placed under the direction of the Miscellaneous Manufacturing Department which at that time was under the supervision of Mr. Lammot du Pont, but due to the fact that Mr. du Pont had many other interests to look after, the Paint business was put under the administration of Mr. Charles A. Meade as Manager, with Mr. Frank S. MacGregor as Control Manager. However, for the practical conduct of the business, the Management consisted of Mr. J. E. Hatt as Manager, with Mr. E. R. Glancy in charge of production and Mr. R. T. Sample in charge of Sales. At this juncture, Leo. P. Nemzek was brought in (from John Lucas & Co.) as Technical Director. At the time of Du Pont's entry into the paint business, the Du Pont sales organization was composed essentially of men whose primary experience was in Explosives, and by 1917 an efficient selling organization had been established, but it was apparent that this highly specialized sales organization lacked the background necessary for aggressive penetration of the paint market where trade practices and merchandising methods were radically different from those covering the explosives field. Consequently, it was decided to utilize and to continue with the then existing sales organization which had been created by Harrison, and to place men, long experienced in the Du Pont methods, in key positions in the newly acquired Department.

The business continued in about the same way and with the same lack of progress as under the old Harrison regime. It was assumed that by the purchase of Harrison it would give Du Pont a good start in the Paint industry, but because of either non-aggression or lack of

vision, the business remained status quo. To promote quicker growth, this then led to the Development Department looking into the acquisition of the Bridgeport business, and as covered in the chapter on the Bridgeport Company little, if anything, was added to promote or facilitate the progress of the Department because of the sudden change in the trend of finishes. After several years, the Company realized that they had an investment in the Paint Department which was larger than their gross sales, - and profits were nil. Unfortunately, this experience established an impression that the Trade Sales or "tin can" type of business was not profitable, but up to this time little or no attention was given to the potential possibilities of this type of paint business. Naturally, this experience with the tin can type of business provoked a big question mark in the minds of the Executive Management Group and there was much speculation as to the advisability of continuing in the industry. Following further study, and after much deliberation, it was decided to investigate an industrial type of organization in the Paint industry, which resulted in the acquisition of the Flint Varnish and Color Works. This was a most fortunate purchase not only because it resulted in the acquisition of a fundamentally sound business but included a fine plant which later served to splendid advantage in the development of the automotive business. The purchase of the Flint Plant then led to their investigation of the New England Oil, Paint and Varnish Company whose business was reported as being largely industrial, but as events later developed it was of a totally different type of Industrial business which the Du Pont Company has today. So, to briefly summarize the acquisition of the four original paint companies, Du Pont acquired little in the purchase of Harrison Brothers, practically nothing in the purchase of the Bridgeport business and the [illegible] England Paint business, but the Flint purchase really solidified

the Paint Department.

Up to this time, there was little or nothing done in the way of establishing a policy for the promotion of the business other than to follow the practices that were previously in effect. The only exception was in tying in the sale of paint with the fatal "composite sales" plan which was put in existence in 1918 and which was finalized in 1919.

In January, 1921, Hunter S. Grubb, who had been in charge of the Du Pont Chemical Company, was put in charge of the newly created Paint and Chemical Department, with E. C. Thompson as Assistant, and the Department handled Paint, Dry Colors, Pigments, and Acids and Heavy Chemicals.

After Mr. Grubb spent justifiable time familiarizing himself with his new assignment, and realizing that the Paint Department was trying the Herculean task of selling several lines (Harrison, Bridgeport and New England) in conflict with each other, which is to say, they were trying to establish separate agencies in each town, all in direct competition with each other. This not only resulted in confusion within the Department itself but more particularly created confusion in the minds of the trade (and ridicule from the competitors) because shipments from the plant were being made to the different customers which included a variety of labels, some of which were Harrison, some Bridgeport and some New England. This confusion came shortly after an episode which involved a conflict between the Sales and Production Departments of the old Harrison group, which resulted in many thousands of gallons of odd shades of House Paint being shipped throughout the country to warehouse stocks and which, due to their unsalability, had to be sold at a considerable sacrifice, causing a great deal of further unfavorable comment. These facts are cited not with any desire

to criticize, but more to emphasize the impression that was created throughout the trade as to the lack of understanding of trade practices by the Company and which resulted in general ridicule by competitors, which took many years to overcome and live down.

When Hunter Grubb realized the difficulties confronting the Trade Sales end of the business, he called for help and invited an independent outside organization to make a quick study of the trade's attitude, which resulted in a recommendation that the old lines of Harrison, Bridgeport and New England (and later, Chicago Varnish) all be discarded and Du Pont start anew with the biggest asset they had - the name "DU PONT" and the Du Pont trademark, the Oval. This was a momentous decision, but Hunter Grubb had the courage and vision to accept the recommendation, which resulted in the creation of the Du Pont Line of Paints and Varnishes and was featured in the first national advertisement which appeared in the Saturday Evening Post on February 24, 1923. (See Chart No. 1). Following this, there was a series of two page advertisements featuring full size packages of the leading items, and a tie-in with the dealer, which was the real beginning of the Trade Sales Department's growth. But, much more about this later.

While all these things were happening in the Trade Sales end of the business, "Duco" was born in 1922, and this fact is mentioned here because it will later be seen how "Duco" helped Paint and Paint helped "Duco" as the business evolved.

February 14 19[illegible]

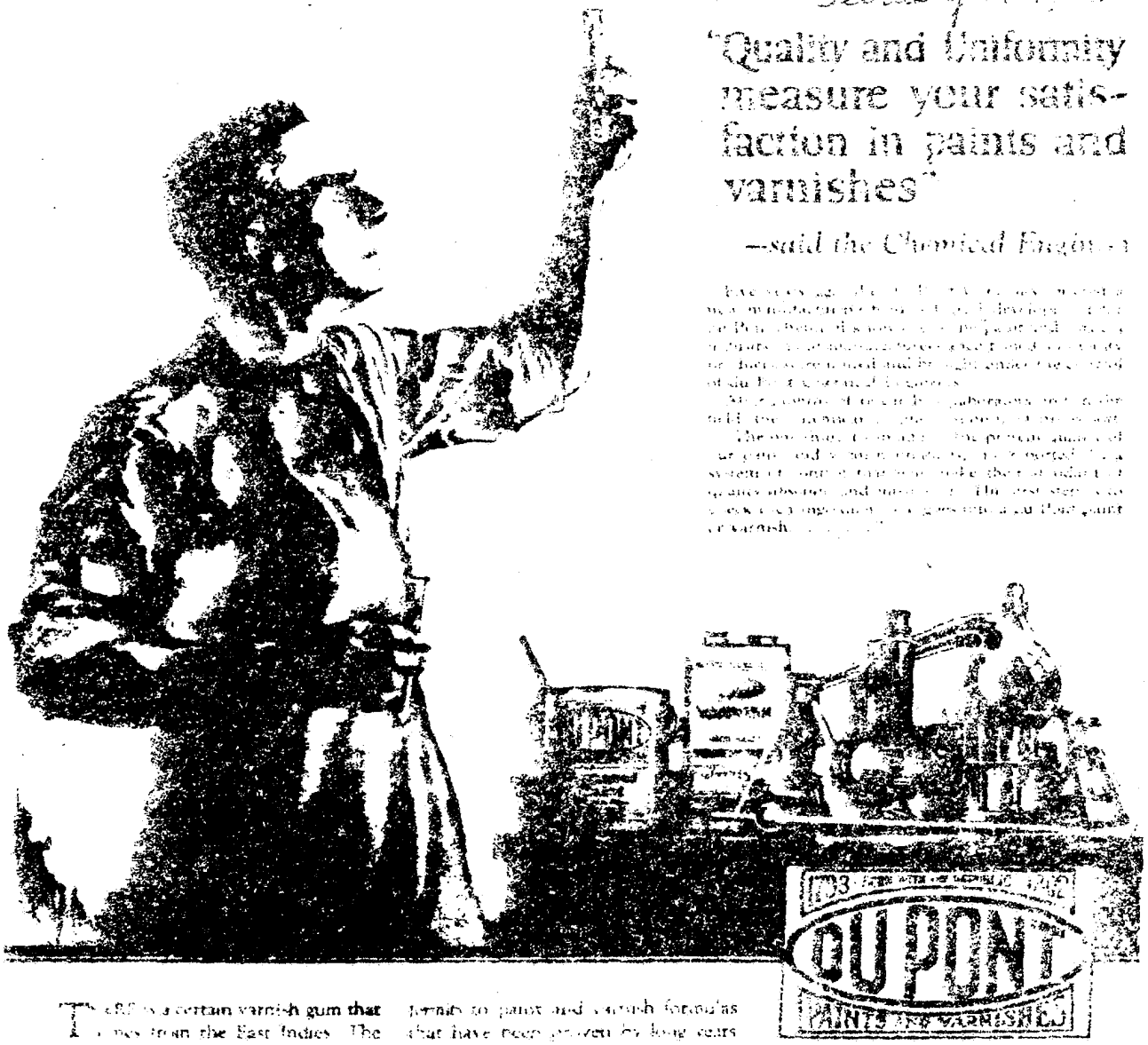
"Quality and Uniformity measure your satisfaction in paints and varnishes"

—said the Chemical Engineer

[illegible] du Pont [illegible] developed [illegible] of du Pont Chemical Engineers.

[illegible]

[illegible] or varnish [illegible]



There is a certain varnish gum that comes from the East Indies. The gum produced by a tree one year, may be vastly different from the gum produced the next year. This degree of variance must be accurately determined before a varnish of uniform quality can be produced. And variance in even one essential ingredient may be the reason why the floor varnish that gave you such excellent service three years ago failed to perform this year. [illegible] Chemical Engineers have found the way to add absolute uniformity to paint and varnish formulas that have been proven by long years of service. They have taken these long tested formulas and by accurately checking every ingredient, and the men at the grinding machines, cooking kettles and mixing tanks now to apply these formulas in order to produce products that will hold to the same standard of quality always.

The du Pont paint or varnish you buy today is certain to be of the same high quality as it was yesterday, or as it will be tomorrow.

These are the [illegible] companies [illegible]

Harrison Bros. & Co., [illegible]

Bridgeport Wood Finishing Company, [illegible]

Chicago Varnish Company, [illegible] making varnish [illegible]

New England Oil, Paint and Varnish Company, [illegible]

E. I. du Pont de Nemours & Co., Inc.

Chicago Varnish Works
Chicago, Ill.

35th St. and Grays Ferry Road
Philadelphia, Pa.

Everett Station, [illegible]
Boston, Mass.

Ask your dealer for du Pont Paints and Varnishes. If he does not carry them, [illegible]

EVOLUTION OF CHEMICAL PRODUCTS DIVISION AND THE INVENTION OF "DUCO"

Following the clean-up in the Company's postwar affairs, there were many excellent executives for whom posts had to be found, in keeping with the Company's general policy of taking care of such men.

Fortunately for the Paint Department, among the group was William P. Allen (who distinguished himself in the production of gun cotton at the Hopewell, Va. plant during the first World War). He was appointed on November 1, 1921 as Assistant General Manager of the then Chemical Products Division (Mr. R. R. M. Carpenter was General Manager). On April 1, 1923, Mr. Allen was made General Manager.

Another postwar executive was Mr. J. W. Elms, who was transferred from the Military Explosives Department to the Chemical Products Division, as Production Manager, and in 1923 was made Division Manager. Mr. J. J. Moosmann at that time was Director of Sales and was advanced to the position of Assistant Division Manager, Mr. Moosmann being succeeded by Mr. E. M. Flaherty as Director of Lacquer Sales, and Mr. R. E. Lackey as Assistant Director of Sales.

It was during the regime of these men at Parlin that "Duco" was invented and exploited.

As referred to in the chapter describing the Parlin Plant, high viscosity lacquer, bronzing liquid and miscellaneous enamels and solvents were the principal products sold, the total sales approximating two million dollars. At that time, the field of prospects was limited, but the development of "Duco" was like an atomic bomb hitting the entire industrial world in that it changed not only the paint industry but more so the production methods of general industry, such as the automotive, furniture and other large production units.

This new chemical product changed the whole concept of the paint business and, henceforth, from the use of orthodox products which was

practically all the industry knew about up to this time, chemistry became a most important factor.

Here it should be stated with emphasis that Du Pont - and only Du Pont - made the first big real contribution to the growth of the paint industry, and the figures shown elsewhere in this report covering the huge growth of the industry from 1925 on is attributable first to the development of "Duco" and later to the development of "Dulux", the two biggest contributions that have ever been made to the industry.

THE DEVELOPMENT OF "DUCO"

In 1920, the Parlin Plant was divided into several units. One made solvents, another made lacquers, and another made motion picture films.

Motion picture film, which consists of a flexible film of nitrocellulose coated with a sensitive coat of photographic emulsion, was just getting into production at the film plant. During the cold months of early 1920, a great deal of spoiled film was produced because, in rolling up the film, enough static electricity was produced, the flashes of which produced light-struck streaks on the film. A research project was started in the laboratory in an attempt to prevent the formation of this static electricity during the manufacturing operations, and some laboratory studies indicated that if a small amount of sodium acetate were added to the solution of nitrocellulose from which the film base was cast, enough conductivity was added to the final film base so that any accumulated electricity would be drained off before enough built up to produce a spark. The laboratory results looked so encouraging that by the summer of 1920, it was decided to make a full plant scale run of film dope containing sodium acetate.

The unit of the Parlin Plant which manufactured lacquers, accordingly made up a batch of a very heavy nitrocellulose solution

containing the amount of sodium acetate which the laboratory results had shown would effectively prevent the formation of static sparks. The plant was to have this large batch of dope cast on the large plant testing wheel in the factory.

At this juncture, however, there was a severe breakdown in the power facilities at the film plant and the experiment could not be carried out at the time planned. Several days later when the repairs had been completed, the drum of nitrocellulose jelly, containing the sodium acetate, which meanwhile had been sitting in the hot sun, was carried to the film plant to be cast into moving picture film base. When it was opened, however, it was no longer a stiff, castable jelly, but had become a thin, syrupy, lacquer-like material.

This queer behaviour aroused the scientific curiosity of the men in the lacquer plant who had never come in contact with any commercial lacquer which contained more than from 4% to 6% of nitrocellulose. Here was a thin lacquer-like material which they knew contained a very high percentage of nitrocellulose because they had mixed the ingredients themselves. They began to wonder whether the sodium acetate offered a means of obtaining, and controlling a low-viscosity solution of nitrocellulose of high concentration. Accordingly, they outlined experiments for the lacquer laboratory to perform which comprised making up high concentrations of nitrocellulose jellies containing various amounts of sodium acetate and storing them for various periods in a hot room which would simulate the standing of the steel drum in the hot sunlight during the summer months. These solutions were examined from time to time, their body, or viscosity determined, and experiments made to see whether useful lacquers could be made from them.

The work progressed so well that by January, 1921, a finished

lacquer, of satisfactory viscosity containing 16% of nitrocellulose with the necessary softeners and resins was made up, and was sold to a brush manufacturer for use as a substitute for shellac in finishing brush handles. The product immediately proved a success and was, at that time, christened "Viscolac".

The new product, containing as high as 16% nitrocellulose immediately began to replace the conventional 4% to 6% lacquers at various locations throughout the country, particularly for the finishing of brush handles, pencils, builders' hardware, light fixtures, etc.

> "For centuries, men had been paying toll to the slow-drying qualities of paint. The toll had not been so serious in the leisurely days of hand-labor, but the rapid pace of mechanized industry had made it an item of formidable size on all cost sheets.
>
> "Motor cars and trucks rolled from the assembly lines of American automobile plants with the clanking monotony of a mechanical Mississippi, but at the toll-gate of paint, mass production groaned to a stop. It took at least a week to paint the humblest vehicle, a month or more to finish the motor aristocrats. No less than twenty-two separate coats of primers, surfacers, rough-stuff, glaze, color and varnish constituted the standard of painting perfection, such as it was, according to the methods of an art as old as the Pyramids and fundamentally as little changed. Acres of car bodies jammed warehouse floors in the process of finishing. Some producers had as many as 15,000 car bodies impounded at one time.
>
> "Furniture manufacturers were in a similar predicament, although they had learned to recognize that paint and patience

were synonymous. Makers of pianos spent weeks in varnishing and polishing, coat upon coat. Locomotives and ships, bicycles and velocipedes, wheat-harvesting combines and tops, steel bridges and bric-a-brac, broomsticks and lead pencils, alike they waited upon paint and paid toll to its failings.

"That toll, annually, ran into large sums. A glass of water carelessly placed on the piano marred in an hour the mirror-like surface that workmen had toiled over for weeks. The varnished tops of dining tables soon became ringed and blotched. Motor car finishes cracked and discolored.

"So acute was the problem in the automobile industry that special committees were named to make studies of it in the hope of finding a solution. Shabby-coated used cars, accumulating in dealers' stockrooms, jeopardized the sales structure and the industry's future. A body finish was needed that could be put on, dried, and polished in hours, and, equally important, which would withstand the punishments of road service as long as the car itself.

"Such a finish, said paint experts, was as unattainable as the moon. It took time for paint to dry, and it always would, they asserted. The experimenters at Parlin, New Jersey, however, refused to be discouraged. They were not thinking in terms of paint. Lacquer occupied their thoughts."

As related in the foregoing, a solution seemed to be in the making. In the fall of 1921, the new experimental lacquers were used in refinishing several automobiles at the Parlin Plant, and the results looked so encouraging that the paint committee of General Motors Corp. was told about this new discovery in February, 1922. Samples of the new materials were submitted, and steel panels showing the results

were offered. About three years were spent in testing and improving the product. Metal and wooden panels were set out on racks for weather testing against all of the elements. They were pounded, scratched and scrubbed, smeared with mud, sand, oil, grease, gasoline, alcohol and road tar. Used cars were lacquered and put into road service. Therefore, General Motors' experts were apprised of the facts about this new product, now given the trade name "DUCO". At that time, the finishing of an automobile with the then known orthodox paint and varnish materials required weeks of time, tying up valuable floor space, hindering production, and from a durability standpoint the finishes were far from satisfactory. General Motors' executives knew that if they could reduce the time of finishing an automobile, production could be speeded.

" General Motors' engineers and chemists worked side by side with Parlin executives and chemists throughout the stuffy heat of that summer. Difficulties attendant to adapting the new finish to the exacting requirements of large scale automobile production began to find solutions.

"That autumn (1923), the Oakland Division of General Motors, which was then in charge of Mr. A. E. Glancy - at one time superintendent of the Harrison Brothers Plant - introduced "Duco" lacquer on its open car models and, as rapidly as production problems allowed, extended the use to the entire 1924 line. Doing yeoman work in the proper application and use of "Duco" on automobiles throughout this period was R. C. Williams (now Manager of our Automotive Division in Detroit) who had been sent out to Detroit to help get the program properly started. Here tribute should also be paid to the very fine team work of Messrs. Flaherty, Moosmann, Elms, Callahan, Shields, Hitt, Arke, and a host of others, all of whom labored day and night to help

in this successful expedition.

"By April, 1924, Cadillac, Cleveland, Franklin, Lexington, Marmon and Moon were all prepared to finish their cars with "Duco" upon request, but due to the startling and sensational announcement of this new finish "Duco", as illustrated by the ad attached, which appeared in The Saturday Evening Post in March, 1924, public demand for the new finish began to roll in on the retail car dealers, and it wasn't long before the entire automotive industry was anxious, more so than being interested, to use the new product. In July, 1924, after exhaustive tests - one car having been sent around the world - Buick adopted "Duco" for its sports roadster, and shortly after that placed it on other models. The motor industry's paint dam burst, and a majority of the cars displayed in the 1925 Automobile Show specified the new finish as standard or optional."

What happened is now history - but Du Pont made it all possible through chemistry.

"Before another year, the old-style paints and varnishes were on the down-road to elimination from the field of automotive body finishes, and interest was becoming quite general for this product for use on washing machines, gasoline pumps, radio cabinets, golf clubs, caskets, vacuum cleaners, and particularly furniture."

The paint industry was in a turmoil. Orthodox finishes could not compete with this sensational newcomer, which made it possible to finish a motor car in two days - later, in one day - and later many cars in one day - and which wrote a new trade definition for durability as well as beauty.

As stated previously, prior to the development of "Viscolac" and later "Duco", Du Pont had only a small business in Parlin-made products, but with this remarkable development it necessitated rapid expansion and building new application technique for other industries which created a rapidly growing industrial organization to handle all the inquiries that kept pouring in from all avenues of the industrial world.

Having demonstrated what could be done in the automobile industry in both improvement in appearance as well as revolutionary production methods, sales and service to the furniture industry rapidly began to grow, - but other manufacturers, who previously supplied these industries, began to apply chemical technique in their own plants and competition soon became apparent with resultant price cuts to enable competitors to hold their old accounts.

> "This discovery of "Duco" did more than revolutionize methods. It changed the trend of thought. Progressive manufacturers everywhere sought to improve all their products. The original "Duco" lacquers were steadily improved, and today the finishes-compounder studies his industry's problems through scientifically critical eyes, which see paint as a first line of defense against decay, rust and general deterioration, and as a factor in the preservation of the national wealth."

At the expense of repetition, we again say that Du Pont's contribution of a commercially usable lacquer like "Duco" changed not only the paint industry but the production methods of the general industrial world.

Out of this development, in addition to the growth of Du Pont's industrial finishes business was born an entirely new industry, wh

is termed the Refinishing Industry, having to do with the refinishing of mostly automobiles and some furniture. But, the details of the growth of the Refinishing Division of the business will be covered in another chapter. In addition to the Refinishing business, evolved another division of the business, referred to as the Chemical Specialties Division, which started with the necessity for a polish to help keep "Duco" sparkling. After "Duco" was initially used on automobiles, the automotive manufacturers demanded that Du Pont furnish a polish to help keep the product clean. This resulted in the development of "Duco" Polish, and later a line of other automotive specialties, the details of which will be covered in another chapter under the subject of "Chemical Specialties".

Du Pont followed "Duco" with the "Dulux" series of synthetic resin enamels, introduced in 1927, and since then widely amplified, but the story of "Dulux" will be told in a separate chapter, except that it might be well to mention here that with "Duco" and "Dulux" it put Du Pont in the enviable position of being able to offer to industrial paint users modern products with modern application methods which helped to build for Du Pont the largest sales volume in the Industrial field and to establish Du Pont without a question as the number one supplier.

*Quoted paragraphs are taken from William Dutton's book - "Du Pont - 140 Years."

THE SATURDAY EVENING POST

DU PONT ANNOUNCES AN ENTIRELY NEW TYPE OF FINISH

GREATEST ADVANCE IN FINISHING ART IN QUARTER-CENTURY

Duco Finish Gives to Wood or Metal a Rich, Satin-like Surface Whose Soft Lustre Actually Improves With Age

Rich Tones That Last!

Amazingly Durable!

— VISCOLAC —

E. I. du Pont de Nemours & Co., Inc.
Chemical Products Division
Parlin, N. J.

DUPONT DUCO

LICENSING ARRANGEMENT OF DU PONT'S LOW-VISCOSITY LACQUER PATENT.

In 1924, when the entire automobile industry switched from orthodox finishing materials to the newly developed "Duco", consternation was thrown into the ranks of the paint manufacturers, and many of them who had never before been interested in lacquers organized lacquer departments and constructed lacquer factories. Eventually the Glidden Company supplied Studebaker with its low-viscosity lacquer finishes; The Ditzler Company supplied Chrysler; Rinshed-Mason furnished lacquers for some of the General Motors' units, particularly Oldsmobile; and many companies, such as Valentine, Ferbert-Schorndorfer, Jones-Dabney, Forbes, Sewall, and others operated on the fringes.

Clear "Duco" for wood finishing became popular with furniture manufacturers and with the public, and many manufacturers of wood finishes, seeing their regular business slipping away, started to make and sell the new low-viscosity furniture finishes. Lilly Varnish Company and the Glidden Company both became extremely active in this field.

Du Pont, of course, had made a patent application for its new development, and not long after the patent was issued steps were taken to enforce it. There was great reluctance on the part of many of the paint manufacturers of the country to pay royalty to Du Pont for this development, but some of them, being highly patent conscious, executed license agreements with Du Pont which provided for a nominal royalty payment and also contained a paragraph which would permit Du Pont to establish for itself and for its licensees minimum selling prices and terms of sale on the patented products, when and if the patent was sustained in the courts upon litigation.

There were about 50 establishments which were willing to sign agreement and did so; but there were about 200 who refused to sign

and who continued to infringe the patent. It, therefore, became necessary for Du Pont to file patent infringement suits in order to protect itself and its 50 licensees. Suits were filed almost simultaneously against the Glidden Company and the Jones-Dabney Company.

The Glidden suit came to trial first in the New York area, and ended with a complete victory for Du Pont. The three-judge federal circuit court of appeals upheld the patent unanimously, saying that it was valid. The defendant Glidden Company, and about 50 other paint manufacturers who had joined Glidden in the suit with financial assistance brought pressure to bear to have the case reheard before the same court of appeals. The court granted the petition for rehearing, and the case was reargued. Again, Du Pont was completely victorious. The three-judge court for the second time, unanimously upheld the patent, saying that it was valid and infringed.

The opposition, including Jones-Dabney against whom the other suit had been filed, then capitulated and signed up the necessary agreements. Eventually, there were 250 different establishments under license.

With the clean-cut victory in the Circuit Court of Appeals, it was possible, under the law, for Du Pont to establish minimum selling prices and terms of sale for itself and for its licensees in the marketing of the patented lacquers. Each licensee was forwarded a schedule of minimum prices (January, 1934) under the seal of registered mail, with instructions that Du Pont would see to it that none of the patented lacquer was sold at a price below the established minimum.

At first, many of the licensees had the idea that enforcement of minimum prices on such a broad scale would be impossible, and they proceeded in their attempt to get business by employing their old, time

honored price-cutting tactics. It soon became evident that they were not to be successful, because every competitive salesman, when he heard of the price cutting, would report it to his management, who would immediately relay it to Du Pont. Du Pont then got in touch with the violating licensee, and in no uncertain terms told him that his license was in jeopardy, and that one of the paragraphs of his license permitted Du Pont to cancel the license on short notice which would cause him to be an infringer and liable for very large damages. During the first year of the licensing program, complaints of violation and warnings to violators sometimes ran as high as 60 per month; but towards the end of the license term, which ran approximately ten years, violations were few and far between. Du Pont had succeeded in convincing all of the licensees that price cutting would absolutely not be permitted and the entire industry began to sell with better quality and better service rather than with lower prices. The standards of the entire industry were improved and all licensees were in full accord with the principle on which the whole program was carried out. This contribution, along with Du Pont principles of selling their products, slowly but surely had much to do with the growing respect which the industry has for Du Pont.

The quality of automobile lacquers, refinish lacquers, furniture lacquers, and industrial lacquers, all increased markedly during the ten year licensing program, and all licensees, as well as Du Pont made a satisfactory profit on their sales of the licensed products.

When the patent expired May 24, 1944, and minimum price control was no longer possible, the 250 licensees were unanimous in expressing their sorrow that minimum prices could no longer be enforced. They would have been willing to continue to pay Du Pont the nominal six cents

a gallon royalty indefinitely if it had been possible for Du Pont to continue to hold the umbrella.

Copies of the final license and a full list of the licensees are to be found in the Hall of Records in Box 17.

EVOLUTION OF DU PONT REFINISH DIVISION

In the Spring of 1923, five years after the close of the first World War, twenty-seven years after the birth of the automobile, a small carriage painting shop stood in lower Manhattan, on the fringe of the financial district.

There was nothing unusual about the shop -- its duplicate could be found in most large cities throughout the country. What made it, and its companion shops, unique was the fact that the carriage had departed from the American scene years before. The automobile was "here to stay".

But, although the automobile had made great forward strides from the "horse-less carriage", with its fringed top and bicycle tires, the methods employed in painting the new machine were as painstakingly slow and laborious as those followed in carriage painting.

Thus it was that, although the carriage was gone, the carriage painter remained. Perhaps he called himself an automobile painter -- whatever the title it was but an up-to-date name for an ancient craft. As in the days of the victoria and the landau, painting the automobile was a task that took from 30 to 50 days, depending upon the price paid for the job. Coat after coat of pigmented varnish was carefully brushed onto the body. After each coat had dried a day or more, it was carefully hand rubbed with pumice and water.

Not all automobile owners could afford to have their cars painted by professionals, because of the expense. Many owners attempted the job themselves, with results that would have been laughable had they not been so unfortunate.

But while the little carriage painting shop survived in Manhattan and elsewhere in the nation, a material had already emerged from the test-tube that would sweep it away just as the carriage had gone before it.

This new material -- "Duco" -- had already been field tested on several automobiles and had been adjudged ready for new car production.

While "Duco" was being tested by General Motors, tests on refinishing automobiles were also being carried on in a number of paint shops, notably the famous Brewster Shops in Long Island City, and the Dunham Body Company in Newark, N. J.

When "Duco" made its appearance on the Oakland car, it was accepted immediately by the car-buying public. It was far better looking than the old carriage finishes, and its durability far exceeded anything the automobile manufacturers had been able to offer. Car buyers demanded "Duco" on new models -- car owners clamored to have "Duco" applied to their old cars -- dealers sought a means of repainting the thousands of used cars that clogged their lots, that found no buyers because of the miserable appearance of their faded, cracked finishes.

However, "Duco" was not applicable to the carriage painter's art. It had to be applied by spraying. Thus, Du Pont was faced with the opportunities of a waiting market for "Duco" in the automotive refinish business -- and no outlets through which to reach that market.

Normally, such a problem could be simply solved. Given a product for which there is a tremendous demand, and no service outlets, the manufacturer ordinarily would need only publicize the opportunity and select from the thousands of applicants those he believed most reliable and financially stable, and award franchises. However, "Duco" presented a problem that was not ordinary. "Duco" had to be applied properly, to a surface correctly prepared to receive it.

And so, Du Pont solved the problem not by altering the product to fit existing methods of merchandising, but rather by creating an

entirely new industry -- the automobile spray refinishing business.

And thusly, the Refinish Division was created. This was in the spring of 1923. In getting started, there were three basic problems:

1. Distribution.
2. Teaching the use of "Duco".
3. How to be sure the car owner obtained a representative "Duco" finish.

Distribution of "Duco" nationally was secured by the granting of 31 exclusive distributorships throughout the country. In all cases these distributors were either qualified body builders and painters, or having an outstanding reputation in the automotive field and who were conversant with the problems of automobile repainting that existed at that time.

In order to assure the proper application technique of the new material, the distributor's painters were thoroughly trained in the proper method of applying the "Duco" finish. Of course, this was after Du Pont had selected and trained a group of men who were qualified to go in the field to teach the art of refinishing.

In turn, distributors were expected to train all those who applied for the right to set themselves up as "Duco" refinishers. Two schools for training painters were established, - one in Brooklyn, New York, and another in Chicago, and were known as National "Duco" Instruction Shops.

Once a painter showed an aptitude for "Duco" application, he was eligible to apply for an Authorized "Duco" Shop designation. A group of Du Pont inspectors made periodic checks on all shops to make certain that car owners received quality workmanship on "Duco" jobs.

Toward the end of 1924, Du Pont deemed it advisable to review

the progress of their training program, and held their first convention of distributors at Parlin on December 2, 3, 4, 1924. This proved most practical and profitable as it cleared away many misunderstandings. At the meeting it was stated that "Duco" was attracting so much attention it was necessary to police all shops to insure owners getting a genuine "Duco" finish. Accordingly, it resulted in training a new force of inspectors to go to all refinish shops to check on methods, products and results. This was a very important decision because it established a pattern and principle for authorized shops, and protected Du Pont against unscrupulous shops from capitalizing on the trade name which was becoming so famous.

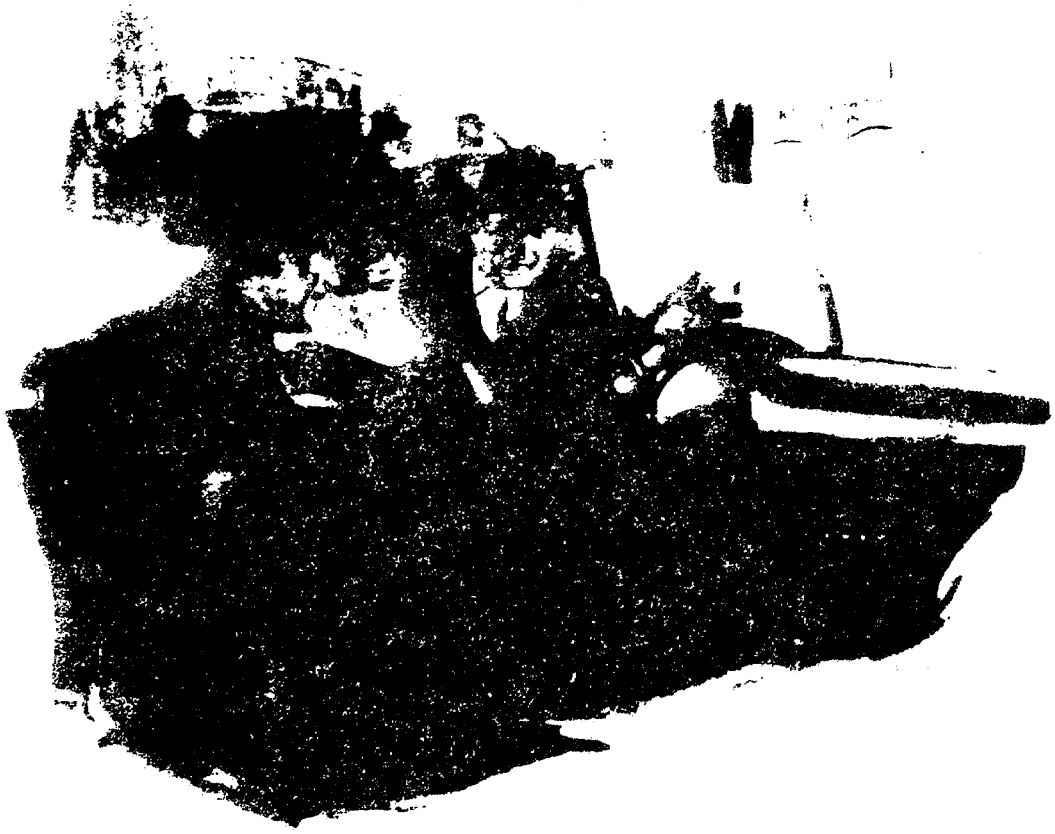
The successful establishment of the "Duco" Authorized Shop spelled the doom of the carriage painter. Most of the old carriage shops faded from the American scene -- a few adapted themselves to the new order of the day, accepted the spray method of automobile painting, and became "Duco" shops.

As of May, 1925, there were 949 authorized refinishers established throughout the country, but as of December, 1946, there were 4081 authorized refinishers and 32,172 unauthorized refinishers. And these all evolved from the development of "Duco" - a really new and large industry.

During the first two years following the introduction of "Duco", Du Pont advertised the new material widely through the pages of such national publications as The Saturday Evening Post. These ads covered every phase of "Duco" application -- furniture, toys, etc. Automobile refinishing was mentioned as one phase of the "Duco" potential.

On February 7, 1925, the first ad devoted exclusively to the refinish story appeared in the Saturday Evening Post. (Copy attached). The distinctive sign awarded all Authorized "Duco" Shops was featured

February 1, 1945



"It looks like a new car

"—and thank you for your promptness.

"DUCO makes the old bus look wonderful.

"To tell you the truth, I used to be a little bit self-conscious in the traffic line—like a man in a crowd who hasn't shaved.

"No, we didn't miss the car over the week-end . . . stayed home and did some chores 'round the house that I've been putting off for months, and the few extra week-days my wife shopped over the 'phone.

"It has certainly been worth while; and when I do turn the car in, its re-sale value will be much higher.

"Well, good-bye . . . . you say just water and the occasional use of DUCO Polish will keep it looking like this?

"Easy enough . . . . ."

E. I. DU PONT DE NEMOURS & CO., INC.
Chemical Products Division
PARLIN, N. J. PAINT MFG.

DU PONT DUCO

DU PONT

THE [illegible] DUCO Refinisher [illegible]

Authorized DUCO distributors

ALABAMA
[illegible]

ARIZONA
[illegible]

ARKANSAS
[illegible]

CALIFORNIA
[illegible]

COLORADO
[illegible]

CONNECTICUT
[illegible]

DELAWARE
[illegible]

DISTRICT OF COLUMBIA
[illegible]

FLORIDA
[illegible]

GEORGIA
[illegible]

IDAHO
[illegible]

ILLINOIS
[illegible]

INDIANA
[illegible]

IOWA
[illegible]

KANSAS
[illegible]

KENTUCKY
[illegible]

LOUISIANA
[illegible]

MAINE
[illegible]

MARYLAND
[illegible]

MASSACHUSETTS
[illegible]

MICHIGAN
[illegible]

MINNESOTA
[illegible]

MISSISSIPPI
[illegible]

MISSOURI
[illegible]

MONTANA
[illegible]

NEBRASKA
[illegible]

NEVADA
[illegible]

NEW HAMPSHIRE
[illegible]

NEW JERSEY
[illegible]

NEW MEXICO
[illegible]

NEW YORK
[illegible]

NORTH CAROLINA
[illegible]

NORTH DAKOTA
[illegible]

OHIO
[illegible]

OKLAHOMA
[illegible]

OREGON
[illegible]

PENNSYLVANIA
[illegible]

RHODE ISLAND
[illegible]

SOUTH CAROLINA
[illegible]

SOUTH DAKOTA
[illegible]

TENNESSEE
[illegible]

TEXAS
[illegible]

UTAH
[illegible]

VERMONT
[illegible]

VIRGINIA
[illegible]

WASHINGTON
[illegible]

WEST VIRGINIA
[illegible]

WISCONSIN
[illegible]

WYOMING
[illegible]

DUCO

in this ad, and all distributors were listed. This use of the Authorized "Duco" Shop sign was a device to educate the car-owning public to look for the sign as an assurance of a "Duco" job properly applied.

Three years later, a national advertising campaign was instituted in three leading weekly magazines, emphasizing the Authorized "Duco" Shop. This campaign continued until the early 1930's.

Meanwhile, the authorized shop program was being given the impetus of a concerted merchandising campaign. The metal "Authorized Shop" sign was made available to all refinishers agreeing to use Du Pont materials exclusively, in accordance with our application specifications.

During the first years of "Duco" promotion, many attempts were made to infringe upon the name. However, prompt legal action in all cases established and preserved the legality of our trade-mark.

Initially, the "Duco" line was offered in only 21 colors. It soon became apparent that a complete line of colors used on all cars would be necessary, in order to offer car-owners an accurate and complete color matching service on touch-up work. In October, 1924, the first color bulletin was issued, showing the colors used on various makes and models in new car production.

The original Refinish line consisted solely of "Duco", in colors and black, and "Duco" Thinner. In November, 1924, undercoaters were added to the line, and one month later, "Duco" Rubbing Compound was introduced, along with "Duco" Cleaner and No. 7 Polish. Thus, Du Pont was able to offer the refinisher a complete line of "Duco" products, from the undercoat through the final polish of the finished job.

On January 1, 1925, the first Refinish price list was issued, listing "Duco" at $6.40 per gallon in one-gallon cans, and thinner

at $2.50 per gallon, in drums. In keeping with the Du Pont Company policy of reducing prices wherever possible commensurate with sound business practice, "Duco" prices were reduced to a low of $5.00 per gallon on colors and $4.25 per gallon on black in 1937. Subsequently, prices were increased slightly due to raw material increases and inflated manufacturing costs.

Until July, 1925, the specifications for "Duco" application in refinishing work called for complete removal of the old finish, by burning and scraping or the use of a paint remover. At that time, the specification was altered to allow the application of "Duco" over the old finish, provided it was in sufficiently good condition to produce a firmly anchored finish coat.

During the first two years of its history, the headquarters of the Refinish Sales Section was located in Parlin.

In October, 1925, the Refinish Sales headquarters was moved from Parlin to Detroit, and placed under the Automotive Sales management. Sales offices were established at Parlin and Chicago, with San Francisco operating independently.

In April, 1926, a far reaching move was made by the Chevrolet Division of General Motors, which greatly benefitted Refinish. Used cars had become a big problem to Chevrolet dealers. They couldn't sell them and the dealers' capital was rapidly being frozen. After an extensive investigation, the Chevrolet officials decided that the solution to the problem was to get the dealers to recondition their supply of used cars, which included refinishing.

Chevrolet trained crews of painters and sent them into the principal cities on the Atlantic Coast, demonstrating the increased used car sales potential that developed through the simple expedient of improving the appearance of such vehicles by repainting and re-

conditioning. The initial demonstrations were so successful the plan was extended on a national basis, and as a direct result, thousands of car dealers who had never before considered refinish shops became vitally interested in this phase of their operation.

Refinish Sales took a step in January, 1926, that was designed to extend the scope of its business. In an effort to increase the volume and profits of refinish shops, specifications were issued covering the refinishing of furniture in "Duco" Clear and colors. It was believed at this time that authorized and unauthorized "Duco" shops could operate a furniture refinishing department and thus develop a greater potential.

The plan was a failure, owing primarily to the fact that most furniture refinishing involved some woodworking -- which auto paint shops were not in a position to carry out.

One year later, however, Du Pont was able to in some measure achieve the purposes of the furniture refinishing program by recommending that auto paint shops enter the refrigerator repainting business. Here, working with metal surfaces, the refinisher was at home. Too, the finish on most refrigerators was "Duco". Many shops throughout the nation developed a profitable business in this phase of their operation, and have continued to do this sort of work to the present day.

January, 1928, brought the introduction of 259-Line Flexible "Duco" for commercial vehicles. Progress in this field was limited, owing to the preparatory work involved, and until the development and release of "Dulux" finishes, this market remained dormant.

The owner of the company distributing "Duco" in Boston, Washington and Atlanta died in June, 1928, and rather than appoint new distributors in these areas, the Company set up "Duco", Incorporated to handle its distribution. This marked the first change in the system of "Duco" distribution, a change that was to develop in later years into a policy

of replacing all distributorships and relying upon jobbers to more adequately service refinish shop customers.

The first jobber was signed in 1930 -- The Cameron & Barkley Co., Charleston, S. C. -- operating under "Duco", Inc. of Washington. The success of the new plan in Charleston led to the subsequent extension of the jobber plan throughout all Distributors' territories.

SERVICE WAREHOUSES

As the demand for Du Pont Refinishing products kept growing, it became evident that the Distributors alone could not render adequate nor prompt service.. Management therefore concluded that jobbers were necessary in every trading area. In 1932, a program, national in scope was initiated in widening the number of outlets, and by the end of 1933 - 117 Jobbers were appointed. This expansion program continued and by the end of 1941, there were 771 Jobbing outlets. Coincident with this expansion, Du Pont opened four warehouses, and as Distributor connections were being absolved by the establishment of Du Pont Service Warehouses, the whole distributing structure kept getting stronger - by the end of 1946, there were only three Distributors remaining and Du Pont now has 38 Service Warehouses and 1500 Jobbers - with more to come - thereby providing all Refinishing Shops with almost immediate service.

- - -

Incidentally, it was in May, 1930 that Motor Car registrations were adopted as a measuring stick to estimate sales potential and to compare performances in the respective territories. Thus, it should be apparent as to the justification of widening the number of jobbing outlets.

"Dulux" for Refinish was first announced in January, 1930, and it soon became apparent that Du Pont, for the second time in seven

years, had stolen a march on the rest of the paint industry.

Refinishers hailed "Dulux". Here was a finish that required no compounding, hence reduced labor costs and meant the shop operator could take the lower-cost work he had formerly had to turn down.

Automobile dealers found in "Dulux" a perfect finish for medium and lower-priced used cars -- they could turn out the repaints faster, at less shop cost, and could get better prices for cars they previously had felt did not warrant a "Duco" repaint.

Initially, "Dulux" did not solve the problems of the commercial vehicle business. However, when Preparakotes were released, in 1935, the "Dulux" system for trucks, buses and other commercial cars became the No. 1 painting specification throughout the industry. Recent surveys by fleet publications show that "Dulux" is the favored finish by a margin of 4 to 1 over the second choice material.

In November, 1932, in line with the general reorganization of the F. & F. Department, Refinish Sales headquarters was moved to Wilmington, with Mr. J. T. Edgerly, as Manager, and regional offices were established at Philadelphia, Boston, Atlanta, Chicago and San Francisco. Dallas was added to the Regional set-up in 1940, and Cleveland in 1946.

February, 1934, saw the introduction of the Calibrated Mixing Set, a series of small measures designed to allow refinishers to mix colors to match factory standards within their own shops. By including the color formula for all "Duco" colors in our Motor Car Service Bulletins, it was hoped that refinish shops might be able to produce a good match for any car that came into the shop, particularly in emergencies where extreme speed was demanded and time did not allow a pick-up of an out-of-stock color.

Although the Mixing Set was as accurate as any ever offered the refinish trade, its success was limited and despite aggressive merchandising the set fell by the wayside.

In October, 1935, "Duco" Metallic Colors were released, providing new color effects and more beautiful finishes for America's automobiles.

"Pyralux" was introduced in April, 1937, and gave a third finish to round out the Du Pont line. Developed primarily for lower-cost touch-up and over-all jobs, "Pyralux" filled a definite want in the refinish business. It was discontinued during the war, and due to distinct improvements in the "Duco" 246-Line, will not be reinstated.

In 1941, just prior to the introduction of raw materials allocations, "Dulux" products, based on alkyd resins, constituted 46% of the total production or 968,036 gallons, as against 1,136,954 gallons of PX materials.

The war years were trying years for the Refinish Sales section. "Dulux" had to be virtually abandoned due to a lack of phthalic anhydride -- "Duco" production was reduced considerably. Nevertheless, Du Pont was able to hold its distribution system together and actually to emerge into the reconstruction period with a large backlog of new jobbers, sold during the war on a "when available" basis.

The end of the war did not mean the end of shortages. "Dulux" production was resumed, only to be shut off a few months later. First materials were in short supply. When that situation righted itself, containers became almost impossible to secure. Actually, two years after the war ended, "Dulux" products were still so far short of demand that all efforts to advertise and merchandise, "Dulux" again had to be dropped. They just couldn't take care of a fraction of "Dulux" back orders, let alone seek new outlets.

However, despite shortages and recurring problems of production,

Refinish Sales in 1946 rose to a new high - six times the sales volume predicted in 1925 as the absolute ultimate in the Refinish business!

In fact, the writer can recall, during the recent war period, when Management thought the Refinish Division was almost ready to fold up. Unfortunately, that attitude manifested itself on several occasions - and it should be emphasized here that the Paint Industry is stable and sound, and that Du Pont's growth in it is only going to be in proportion to the effort they put against the market. See the chart showing the growth of the industry from 1922 to 1946, and Du Pont's growth in comparison.

One of the most pressing competitive problems Refinish Sales has had to face concerns the extent to which "Duco" factory-matched colors should be produced. The tremendous pressure exerted by manufacturers including color mixing machines in their merchandising and sales programs naturally influenced Du Pont's own color production.

The solution was the establishment of a postwar policy of producing all new-car production colors for current models and the three preceding years, plus any colors used on older models for which the demand exceeds 75 gallons per year. It is believed that this policy will provide the majority of refinishers with available matching colors for practically any touch-up job that comes into their shop.

The carriage shop is gone, and with it the master artisan who produced the beautiful decorative motifs that adorned the regal victoria. In its place is a new industry, giving employment to thousands more than were involved with carriage painting, producing better, faster automobile paint jobs, better geared to the faster tempo of modern living.

In the short space of twenty-four years, Du Pont chemistry has created an industry -- created it, and dominated it with outstanding

products. And the history of Refinish Sales is young. Steadily expanding, it outstripped the most expert early estimates of its scope. The promise is for greater progress in the future, for like all phases of the Du Pont operation, it is dynamic, rather than static.

Still to be released to the trade at this moment are the new "Duco" Metalli-Chrome finishes, newer "Duco" formulations in the 246-Line that surpass any materials heretofore marketed under that name, plus several new products that will enlarge the Refinish Line.

To whom credit is due - First to the creators of "Duco" and "Dulux". Then to the Management at Parlin who envisioned the opportunity of the refinishing business potential - and, finally, to the aggression and soundness of the Refinish Sales leaders -- Messrs. Edgerly, Lounsbury, Masterson, Goldich and Baldwin, all of whom have since risen to bigger responsibilities within the Finishes Division. These men kept abreast of the times and kept bringing the Management all the important factors that helped build not only a sound policy, but more particularly unquestioned leadership for Du Pont in the Refinish field.

TIME TABLE OF REFINISH PRODUCTS, AS ADDED

11/3/24 - Withdrew from sales "Duco" Maroons due to poor durability.

11/5/24 - Blue Diamond Undercoats, Primer, Surfacer and Putty.

12/1/24 - "Duco" Rubbing Compound No. 2.

12/1/24 - "Duco" Cleaner & Polish No. 7.

5/4/25 - Retarder.

11/4/25 - Chassis Black No. 2.

2/26/26 - PX Surfacer.

5/12/26 - PX Primer.

5/28/26 - PX Putty.

8/3/26 - Shielding Compound.

5/20/27 - "Duco" Striping Colors.

11/20/27- "Duco" Tinting Colors.

1/6/30 - Hi-Speed PX Primer-Surfacer.

1/11/30 - "Dulux".

3/5/30 - Clear Gloss Lacquer.

6/21/30 - "Dulux" Exterior Clear.

11/28/30- "Duco" changed from 244-Line to 246-Line.

12/9/31 - 246-2048 Black.

6/7/32 - "Dulux" Striping Colors.

5/20/35 - PREPARAKOTE.

5/27/35 - PREP-SOL.

10/25/35- "Duco" Metallic Colors.

2/17/36 - "Dulux" Putty.

4/30/37 - PYRALUX.

8/12/38 - PYRA-PREP.

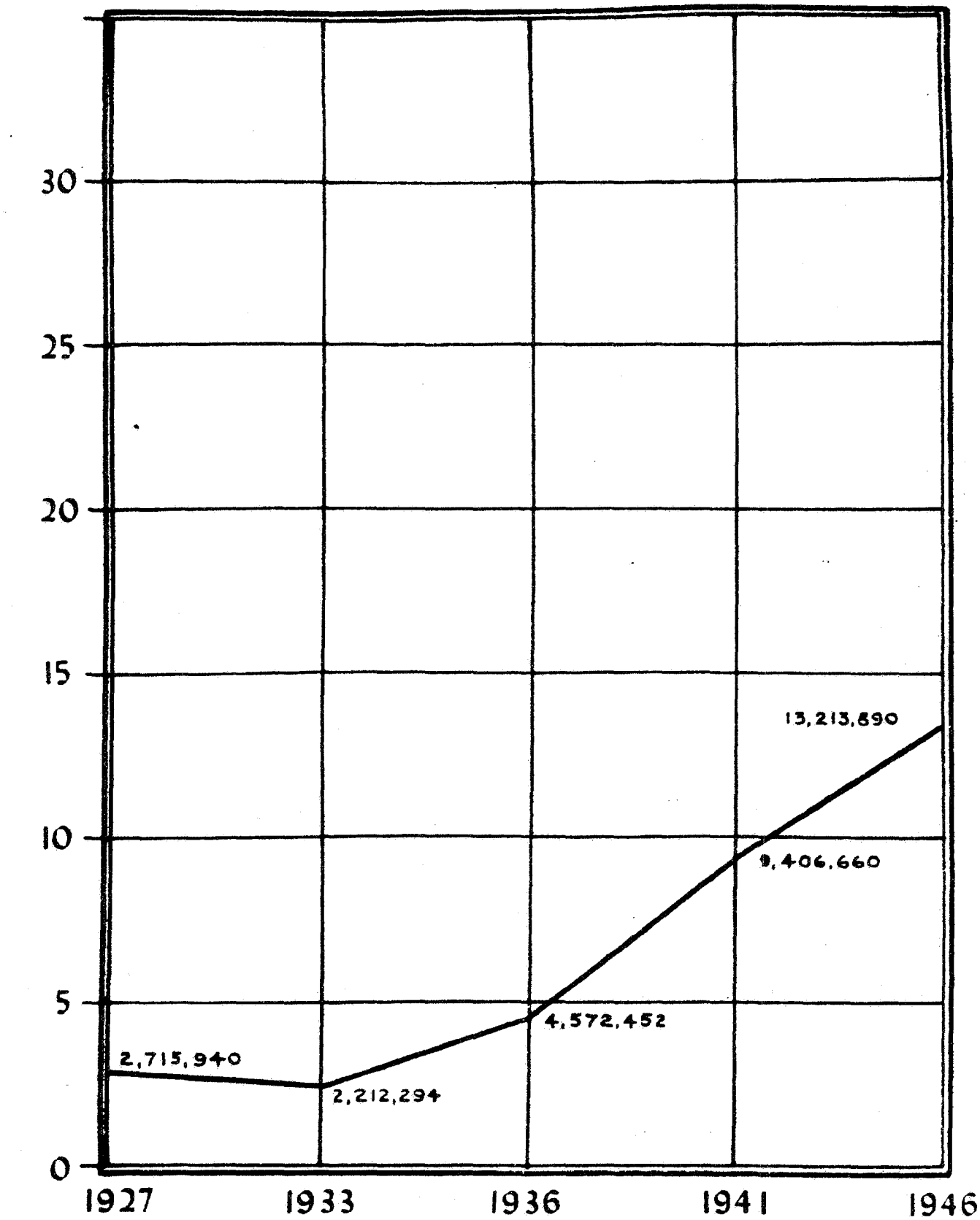
12/8/39 - VARI-TEMP Thinner.

1/27/40 - "Dulux" MAKE-READY Undercoat.

7/14/42 - Automotive BLEEDERSEAL.

5/28/46 - METALLI-CHROME.

REFINISH


MILLIONS
30
25
20
15
10
5
0
2,715,940
2,212,294
4,572,452
9,406,660
13,213,890
1927
1933
1936
1941
1946

EVOLUTION OF THE NO. 7 LINE
CHEMICAL SPECIALTIES DIVISION.

When "Duco" was first developed at Parlin, the chemists thought it would keep automobiles bright and lustrous for years. However, they found that the new finish "chalked" after a year's exposure to the elements, and needed to be polished from time to time to restore its original color and lustre. Oily polishes were tried at first -- the kind then used on the old varnished automobiles -- but they were not satisfactory. Then they tried Bon Ami and Hand Sapolio. These cleaned away the chalked pigment and dirt film, but left tiny scratches which marred the car finish. So Du Pont chemists decided to make a liquid polish especially suited to "Duco" -- containing a fine abrasive to scour away the chalked pigment, and an oil to lubricate the dirt particles so they could be wiped away easily.

In brief time the new polish was formulated, (and improved several times since) but the original formula was sufficiently satisfactory, and put on the market under the name "Duco Polish No. 7". It was planned originally to call it just "Duco Polish" but realizing that other manufacturers would bring out polishes and that dealers would refer to all substitutes as "Duco" Polish, - to avoid confusion and to keep the advantage of selling their own polish for their own "Duco", the figure "7" was added to the name of the product, - thus becoming "Duco Polish No. 7". Later, consumers wondered what the No. 7"stood for". The common assumption was that the formula was the seventh one developed by the laboratory, and the first one which proved entirely satisfactory. However, that was not the case. The "7" was simply used as an identifying mark to insure, if possible, the motorist getting Du Pont "Duco Polish" instead of some other brand.

In later years, as Du Pont brought out other automotive products,

they reversed the procedure and put the No. 7 at the front of the name, and thus called the Auto Polish "No. 7 Duco Polish." The same prefix was used in naming other items, such as No. 7 Top Finish, etc. and the group became known as "The No. 7 Line."

When it was first introduced, No. 7 Polish was put up in tall rectangular pint and quart cans, and packed in wooden cases. That was in May, 1925. The polish was manufactured by the "Chemical Products Division" and, because that division had no specialty salesmen, arrangements were made to have the Paint and Varnish Division, then headquartering at Philadelphia, Pa., handle the sales.

The original policy was to sell direct to dealers as well as to jobbers, all at the same prices. The retail prices were $1.00 per pint, and $1.50 per quart.

The Paint & Varnish salesmen, assisted in a small way by the "Fabrikoid" salesmen, sold the polish to a good many hardware stores and paint dealers but had little success with the wholesalers, for the following reasons:

1. No. 7 Polish was a new product for which there was little demand.
2. The trade discount schedule was all wrong.
3. Du Pont gave the jobbers no protection. They offered dealers the same prices as they offered jobbers.
4. The Du Pont paint salesmen were not contacting the proper outlets. Their calls were nearly all made on hardware and paint dealers when, to sell an auto polish, they should have been calling on service stations, car dealers and other automotive outlets.

In less than six months, it became evident that the polish was not being sold properly, and that sales would almost stop when the Paint and "Fabrikoid" outlets were all stocked. The Paint and Varnish

Division thereupon engaged G. W. Sherin to handle polish sales. Mr. Sherin had been in advertising and sales work for many years, the last six of which were spent as advertising and sales promotion manager for the American Bosch Magneto Corporation, of Springfield, Mass. He was an expert in Specialty selling.

Mr. Sherin was hired by J. W. Elms, Manager of the Paint and Varnish Division, and started in October, 1925, at the main office of the old Harrison Paint Plant at Philadelphia, Pa. A few months later, Mr. Elms suggested to the Chemical Products Division, headquartering at Parlin, N. J., that the manufacture of "Duco Polish No. 7" be transferred to the Philadelphia plant, permitting the Paint & Varnish Division to handle the production as well as the sales, but the Chemical Products Division, then headed by Messrs. J. J. Moosmann and E. M. Flaherty, refused this proposal. They decided to keep No. 7 Polish in their own division, and in May, 1926, they transferred Mr. Sherin to their Detroit office (then handling the division's automotive sales). The Polish was being manufactured at their plant at Flint, Mich.

Mr. Sherin started with four salesmen, one in Boston to cover New England; a second in Philadelphia to cover the middle Atlantic states; a third in Chicago to cover the midwest, and a fourth at Charleston, S. C. to cover the southeast. Progress was slow at the start, first because the market was limited to "Duco"-finished cars, and there were not too many of them at the time, - and secondly, because a lot of paint dealers had been sold at the jobbing price who had to be put back on a dealer basis before Du Pont could get legitimate jobbers to cooperate; and thirdly, because the automobile polish business was comparatively small, neither the jobbers nor dealers would give it much attention. The unit sale was small.

But Mr. Sherin, based on his experience, knew what was necessary

to expand the market and attract new jobbers. He recommended and Du Pont adopted a policy right from the start of advertising the polish nationally. The advertising started with a full-page, two-color ad in the October 24, 1925 issue of the Saturday Evening Post and told the story of "traffic film". (Copy attached.) It explained that tiny particles of burnt oil and grime were discharged from the exhaust pipes of automobiles, and these settled on automobiles and formed a thin dirt film which dulled the lustre of the finish. This was called traffic film, and it was explained that the film could not be removed by washing, or the use of oil polishes. The announcement said that Du Pont, the inventors of "Duco", had developed a special polish which removed traffic film and restored the original color and lustre of the finish -- quickly and safely.

While this "traffic film" story was interesting, Du Pont learned later that it was not entirely true. Careful studies made subsequently by Du Pont chemists showed that the dulling of the lustre was caused largely by chalking of the finish, although a scum did accumulate, and helped to spoil the appearance. The chemists again got busy and formulated a polish which contained a mild abrasive to scour away the chalked pigment, and an oil to lubricate the dirt particles and permit their easy removal.

The original full-page advertisement was followed in 1926 by a series of single column ads in the Saturday Evening Post. Thus, with the aid of national advertising, a sound sales policy and an aggressive selling program, they were able to develop a substantial sales volume on No. 7 Polish (over a million dollars in 1929).

The success of this one item led to competition (as is natural with any successful Specialty) putting other "Duco Polishes" on the market in increasing numbers. This competition was met by adding to

the sales force, increasing the advertising expenditures, and getting some of the leading car manufacturers to recommend "Duco" polish. The manufacturers who adopted "Duco" as their car finish were anxious to have their customers like it and were willing and anxious to do everything possible to maintain the appearance of the car. In due time, Chevrolet, Buick, Olds, Pontiac, Chrysler and other car manufacturers agreed to put three ounce sample cans of No. 7 Polish in the tool kits of their automobiles, and to recommend "Duco" Polish on their windshield stickers and in their instruction books. Du Pont supplied the windshield stickers and the three ounce samples, without charge to the car manufacturers, and for several years furnished approximately 2,000,000 No. 7 Polish samples annually. This gave Du Pont tremendous prestige with the motorists and car dealers, and helped expand sales during the next few years. Eventually the car manufacturers brought out polishes of their own, and stopped sampling and recommending Du Pont's. This was in line with most of the automobile manufacturers marketing a line of automotive specialties for sale through their own dealer organizations.

In February, 1927, Du Pont brought out a black top dressing for use in renewing the finish on rubber coated fabrics, then used on automobile tops. This was a long oil varnish, and was developed in the Flint laboratory. It was called "No. 7 Auto Top Finish" and sold as a companion product for No. 7 Polish. In the same year a third product was added -- a paste nickel polish. That was long before the advent of chromium fittings, and there was a real need for a good polish to brighten the nickel plated radiators on automobiles. Du Pont acquired the nickel polish by purchasing a formula from a Mr. Lee in New York. The price was $500 and proved to be a very good investment, because the nickel polish sales amounted to several hundred

thousand dollars during the next few years.

Du Pont brought out a fourth product in October, 1928. It was a black enamel for use in touching up scratches and worn spots on automobiles. This was called "No. 7 Touch-up Black" and, since practically all cars at that time were finished in black, it had a wide appeal. Sales reached nearly $150,000 during the first 12 months, and increased steadily thereafter. Thus, they had four products and a flourishing business within three years after the start, and were well established as manufacturers of the Du Pont No. 7 Line. By the fall of 1929, Mr. Sherin had 39 salesmen working exclusively on No. 7 products, and H. R. La Towsky was transferred from Trade Sales to help him handle the administrative work. Mr. La Towsky joined the Paint and Varnish Division in June, 1927 and was sales promotion man at the Chicago branch from that time until his transfer to Chemical Specialties.

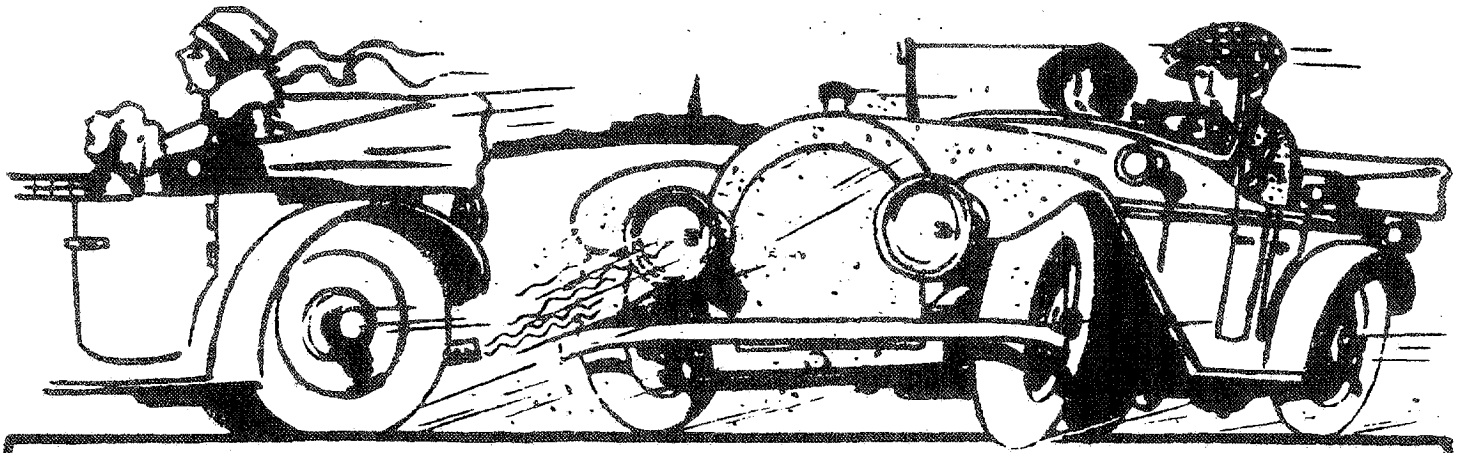
One by one, other products were added - and to date (May, 1947), there are 26 items in the line - including "Duco" Cement and Cellulose Sponges - the sale of which the Chemical Specialties Division is handling for the Cellophane Division. As Mr. J. J. Moosmann pointed out in a study made in 1944, the Chemical Specialties group of salesmen is capable of giving any of the Company's Departments quick and wide distribution on any consumer type of products.

It is probably safe to say that the No. 7 Line of products has the widest national distribution of all Du Pont products.

The foregoing describes the beginning and the development of the Chemical Specialties Department, and as the sales figures will prove, the growth has been remarkable, and like "Topsy" keeps on growing, - all springing from the development of "Duco." Messrs. Sherin and La Towsky have carried the heavy responsibility and are

entitled to the major share of credit for the growth of the Division.

This line, being made up entirely of Specialties (and the unit sale not being large) MUST have advertising support to stimulate demand and be supplemented by missionary sales work in the interest of the jobbers.



WHENEVER you drive—that disfiguring nuisance, Traffic Film forms on your car.

You cannot evade it, for the exhaust of almost every car is loaded with tiny particles of oil, which have passed through its cylinders . . . these gummy oil particles are blown around the body of your car . . . wherever they touch, they *stick* . . . after a while there are enough so they adhere to each other—and then your car is coated with Traffic Film.

Its surface promptly catches and holds, the flying dust, which is everywhere—and, as the film becomes more dense, the beauty of your car, the richness of its color and the brilliancy of its finish can be but dimly seen through the grimy dullness of the film.

Traffic Film cannot injure Duco Finish as it injures old-type finishes, —but it does *hide* its lustrous beauty.

Because Traffic Film is not easy to remove, and because owners of Duco-finished cars wish Duco beauty to be always seen, the same Chemical Engineers who created Duco also produced a new du Pont product—Duco Polish No. 7 which removes Traffic Film.

With a little of Duco Polish No. 7 on a soft cloth, you can easily wipe off the Traffic Film, and reveal the undisturbed, serene lustre of your Duco-finished car.

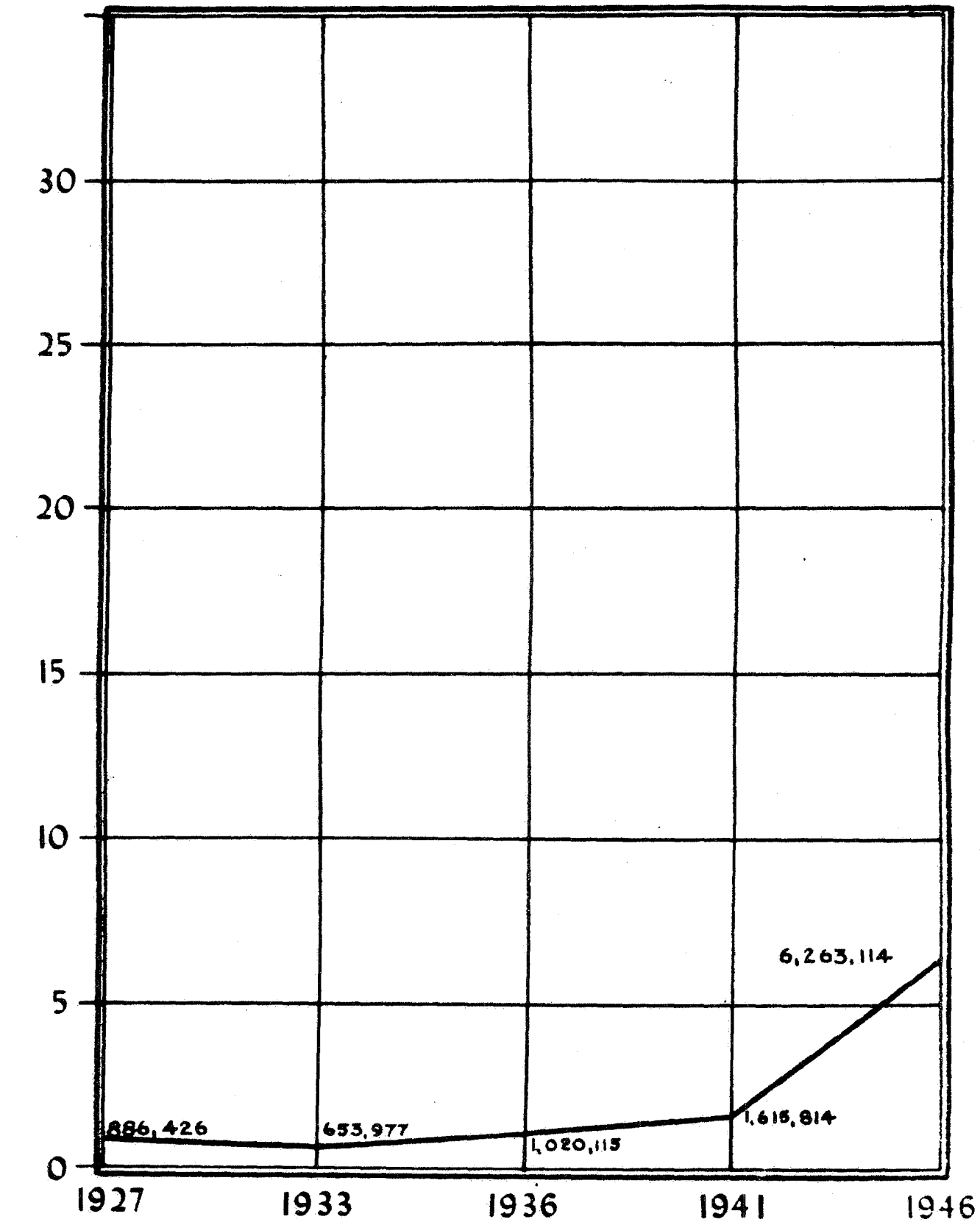
Ask your dealer for Duco Polish No. 7. If he does not supply you, fill out the coupon and mail it to us.

Polish Duco with Duco Polish

the makers

DUPONT

CHEMICAL SPECIALTIES



"DULUX" - THE MIRACLE FINISH

Maybe not as sensational; maybe not as spectacular, but even more far-reaching in its effect on the paint industry as a whole, as well as Du Pont's position in the paint industry, was the introduction of "Dulux".

"Dulux" was Du Pont's second great chemical contribution to the industry.

Like "Duco", this was fundamentally the development of a new type of film-former. Like "Duco" again, it was the introduction into the finish film of a type of film-former that, in comparison with the older oleoresinous films, added a durability against the weather and other extreme conditions that lifted the product out of competition.

Because of their very quick dry, which interfered with application properties, and because of the necessity of rubbing in order to achieve a high lustre, lacquers had failed to penetrate a number of finishes fields. "Dulux", with application properties more nearly like those of the oleoresinous materials, gave the opportunity for penetrating many of these fields.

"Dulux" has as its essential ingredients, chemical compounds, the constituents of which are phthalic anhydride, glycerine and the acid from a vegetable oil like linseed oil. These chemical compounds are known as alkyd resins.

The first real program of research on alkyd resins in the Du Pont Company started in 1924 or 1925, in the Chemical Department (Experimental Station) during a search for a satisfactory resin to be introduced in "Duco" and other nitrocellulose lacquers as a substitute for the natural resin, damar. Mr. M. J. Callahan suggested this program, through having done some research work on alkyds while he was in the

employ of the General Electric Co. prior to his connection with Du Pont.

In the course of its work, the Chemical Department in making up different combinations of phthalic anhydride, glycerine and various modifying ingredients did not unearth any compound which appeared to be of interest as a substitute for damar; but they did observe that when the glyceryl phthalate was modified with an acid from drying oils such as linseed oil, a chemical compound having film forming properties of itself was formed without the addition of any other ingredient. This looked so encouraging that the search for a substitute for damar was abandoned and their program from then on was largely concentrated on the manufacture of various alkyd resins modified with drying oils. These are the resins upon which "Dulux" is based.

The first use of these "Dulux" resins in commercial finishes was undertaken in 1925 by Dr. Cole Coolidge, at the Flint Laboratory, in an attempt to produce more satisfactory automotive undercoats for use under "Duco", - the idea being to achieve through this route a replacement for the inadequate line of oleoresinous undercoaters then being made by the Flint Plant for the automotive industry. This was the first attempt of the Du Pont Company to commercialize the alkyd resin development.

By the end of 1926, this program culminated in the offering for sale of the DUX Primers and Surfacers. Although these DUX Undercoats were superior to the orthodox ones which had been in use up to that time, they were not entirely satisfactory, probably due to a weakness in water resistance. However, the work established a broad background of undercoat pigmentation which has served as the foundation for the currently used undercoats which are so successful today.

At the beginning of 1927 when Mr. John Marshall was organizing

the Central Technical Laboratory at Philadelphia, one of the principle objectives was to conduct research on drying-oil type finishes. The Chemical Department sent some samples of a 62% linseed oil modified glycerol phthalate to the Philadelphia Laboratory for evaluation, which was used by blending with orthodox varnishes to make an Olive Green Dipping Enamel with exceptional properties of flow and toughness. The work on this material led to the setting up of a special alkyd research group in Philadelphia. Chemists were transferred from the Experimental Station and new chemists were immediately employed to man this work.

Dr. C. F. Rassweiler was transferred to Philadelphia from the Chemical Department about June, 1927 with the assignment of trying to relate the composition and properties of finishes with the requirements of various sales fields, this being with a view to obtaining some intelligible starting points for development work on alkyd finishes.

In October, 1927, Dr. H. H. Hopkins was transferred to the Philadelphia Laboratory with the assignment of selecting from the wide range of Chemical Department resin developments a group of three or four resins which might become the basis of a formulating practice covering a wide range of brushability, spraying properties, drying speed and hardness. Interestingly enough, this program resulted in the selection of RC-103, RC-105 and RC-141 for the purpose and these three resins though modified from time to time over the years, are still basically part of our "Dulux" business.

It was also at this time that Messrs. J. B. Bullitt, K. C. Lampert, J. W. Iliff and Paul Robinson were added to the staff of the Central Technical Laboratory and they all played an important part in the development of "Dulux".

With this group and others, Du Pont began correlating the background information on pigmented alkyds against the needs of specific fields of use. By the late winter of 1927-1928, this knowledge was sufficiently in hand so that at a meeting held in Wilmington of representatives from Parlin (Lacquer), Philadelphia (Paint), and the Chemical Department, the laboratorians were able to express an enthusiastic interest in the alkyd field and to support this interest with specific durability and performance information. In this meeting, Parlin took the position of no immediate interest, largely because of the fact that they were fully occupied in the attempt to introduce "Duco" into the industrial field. (During this period, the Paint and Varnish Division, Trade Sales, was absorbing the cost of this "Dulux" development.)

These studies on durability and performance were thoroughly carried out, and in the summer of 1929 "Dulux" was officially offered to the industrial trade at a sales meeting in Parlin. These first examples of "Dulux", although outstanding in film properties, durability, toughness, etc. were not highly successful because, due to the pigmentation, they were lacking in hiding power and mileage. This defect was soon remedied, however, by the experienced and alert Mr. C. R. E. Merkle who suggested a pigmentation change from lithopone to the more opaque titanium dioxide, and during 1930 sales of "Dulux" expanded vigorously.

"Dulux" formulations designed for specific industrial uses were made for signs, refrigerators, automobile wheels, railway passenger and freight cars, street railway equipment, and gasoline service stations and gas pumps. "Dulux" Outside House Paint and Trim Colors were also formulated, but it later became necessary to

withdraw the house paints from the market. The trim colors, however, were held on the market, and have since become the market standard.

In the household enamel field, the lacquer type brush "Duco", which was not successful, was replaced by a "Dulux" Brush "Duco", which again became a real success about 1934.

"Dulux" Super White, which has become the standard of the market as an architectural enamel was a by-product of the successful development of refrigerator enamels and was an adaptation of these in the air-drying field. These "Super-Whites" are outstanding for their color permanence, flow and washability, all qualities inherent in the "Dulux" Refrigerator Enamels.

Although the first real finishes were made by Du Pont, the General Electric Company had made some oil-acid modified glycerol phthalate resins earlier than had the Chemical Department, and as a result the basic patents on such resins were assigned to the General Electric Company. Other early patents were issued to Carleton Ellis and assigned to American Cyanamid Company. There were many Du Pont patents but up to the present time no one has had an enforceable patent position in the alkyd resin field.

As would be expected "Dulux" has many imitators, but in spite of the many imitators "Dulux" stands preeminent. Astute buyers realize that "Dulux" will give them lower unit costs in spite of its higher gallon price. Research is improving it constantly, and the imitators are trying to catch up and may, because due to War Emergency, Du Pont, like all other patriotic companies, gladly gave up proprietary formulas to enable our Government to get the greatest possible durability for the many pieces of war equipment needing a finish.

In this way, competition learned a great deal about the

composition of alkyd resin finishes, but as stated previously, "Dulux" vehicles are made by chemical reactions and require extremely close chemical control. And here Du Pont still possesses an advantage because they make all their own resins in their own specially designed equipment.

"Dulux" has been the standard finish since the early nineteen thirties for refrigerators, washing machines, sink cabinets, for automobiles not lacquered, and for many other industrial purposes. It has so nearly completely replaced other finishes in some of these fields that at one time 92% of all mechanical refrigerators not fabricated from vitreous enameled steel were finished with "Dulux". For these reasons, "Dulux" was the first real threat to "Duco" and it has completely replaced it as a refrigerator finish.

Possibly the time is not far off when most of the automotive "Duco" will be replaced by "Dulux".


DU PONT
"THE WHITEST WHITE WE EVER SAW," say
"IT STAYS WHITE."

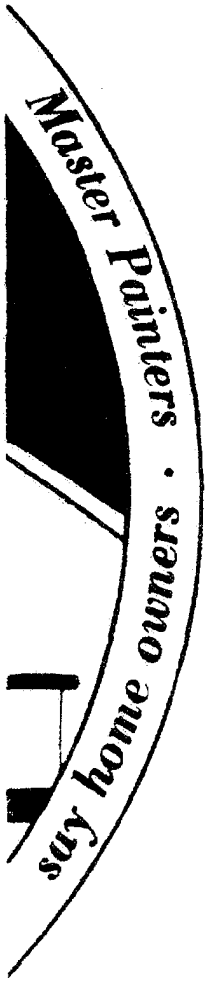
ANNOUNCES

The whitest white enamel ever made

DULUX

REG. U. S. PAT. OFF.

SUPER WHITE



A remarkable new finish for home interiors

JUDGED by *any* standard, DULUX Super White is the finest white interior enamel on the market today.

To begin with, it's whiter. The whitest white enamel you've ever seen. *And it stays that way.* A clear, colorless new vehicle *retains* the full original whiteness — prevents yellowing.

Drying qualities? DULUX is out of dust in two or three hours — is ready for recoating overnight! Yet it sets slowly enough to take up runs or sags and to permit lapping on long stretches.

Remarkable flow is another characteristic. Combined with intense hiding power this means unusual spreading ability. Brushing is easier. There is no drag or pull.

With DULUX Super White you get *more* coverage, *better* coverage, *faster* coverage and the best looking interior jobs you ever turned out.

Make a test of DULUX Super White. See for yourself the possibilities it offers for going after quality jobs at a cost home owners can afford.

. . .

Get in touch with the du Pont dealer today. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

SELL THESE FACTS TO YOUR PROSPECTS

DULUX Super White is a whiter finish. It *stays* white—dries quicker — stays cleaner—cleans easier — withstands severest service —costs less in the long run than inferior finishes.

DU PONT

REG. U. S. PAT. OFF.

DULUX SUPER WHITE

REG. U. S. PAT. OFF.

A MASTER PRODUCT FOR MASTER PAINTERS

TRADE SALES AND WHERE MERCHANDISING AND CHEMISTRY STEP IN

While in the midst of all the excitement created by the revolutionary growth of lacquer ("Duco") sales, Management, in November, 1924, decided to merge the Chemical Products and Paint & Chemical Divisions. On February 1, 1925, Mr. W.P. Allen was appointed General Manager of the newly created Paint, Lacquer and Chemical Department, with Mr. William Richter as Assistant General Manager, the latter appointment being made official on February 15, 1925.

This was not only a logical move but, more particularly, was a psychological one, because the Paint Division needed inspiration and drive. Mr. Allen possessed rare vision, courage and inspiration. He quickly saw that the Paint group needed help.

On Lincoln's birthday, February 12, 1925, Mr. Allen transferred Mr. J. W. Elms from his successful job at Parlin to the Paint Division at Philadelphia and gave Mr. Elms the "go ahead" signal. (Mr. J. J. Moosmann succeeded Mr. Elms as Manager of the Chemical Products Division).

Just as Mr. Elms had to learn about lacquer, (when he first went to Parlin from the Military Explosives Department) he promptly started to study the problems of the Paint Department and quickly recognized that the sights had to be changed if Du Pont was going to progress in the paint business. After Mr. Elms had surveyed the situation, he readily saw the need for an efficient and an enlarged chemical staff and also for the need of someone with a broad picture of sales, markets and merchandising knowledge. For the latter work, they engaged the services of Mr. W. M. Zintl, who had previously been with Harrison Brothers, John Lucas & Company and the Curtis Publishing Company. Mr. Zintl was familiar with the Du Pont problem through his connection with the Curtis Publishing Company, having worked closely with Mr. Grubb. Mr. Zintl joined the Du Pont Company in November, 1925 as Director of

reasonably short period all sales groups realized that chemistry was beginning to play an important part in the development of the Du Pont paint business. Du Pont products were becoming better and better. Confidence grew, - and from then on, the entire organization was convinced that the products being offered were at least the equal of competition, and many much better. As technical service is a definite part of the Industrial Department's sales strategy, many of the service men have been drawn from the laboratory. Therefore, in addition to doing fundamental research work, formulating and developing products, the Technical Departments have been most helpful in furnishing many of Du Pont's best Industrial salesmen and field service technicians.

By the end of 1927, confidence being definitely established throughout the Department, Mr. Allen, having felt he had made his contribution to the Paint Department, decided to retire. This was in October, 1927. On November 1, 1927, he was succeeded by Mr. William Richter as General Manager, and Mr. Elms was transferred from Philadelphia to Wilmington as Assistant General Manager. Mr. W. M. Zintl succeeded Mr. Elms as Manager of the Paint Division, and Mr. W. F. Donohoe, who was Director of Sales of Heavy Chemicals in the Chemical Division, was transferred and advanced to the position of Assistant Manager of the Paint Division. Mr. G. A. Biesecker was appointed Director of Sales, - succeeding Mr. Zintl. This alignment continued until 1928, at which time Mr. Elms, who went to Europe on a special mission, died in Paris in October, 1928. On November 1, 1928, Mr. J. J. Moosmann was transferred from Parlin as Manager of the Chemical Products Division to Wilmington as Assistant General Manager of the Paint, Lacquer and Chemical Department. Mr. E. M. Flaherty succeeded Mr. Moosmann as Manager of the Chemical Products

Sales of the Paint Division.

The basic sales problem was the development of consumer sales through dealers, and the building of industrial volume on orthodox paint products, the sale of which had been transferred to the Parlin office because of their activity in selling lacquer to industrial users. This latter plan was not too successful because the Parlin group was "lacquer conscious" and not "paint minded", but with the later development of "Dulux" by the Paint group, this problem was corrected by the consolidation of the Paint and Lacquer Divisions, at which time it was decided to sell both Paint and Lacquer as Finishes and in that way obviate the conflict between the Divisions.

In the Technical Section, where the staff was neither adequate nor too efficient, Mr. Elms carefully appraised the problem and his conclusions resulted in the transfer of Mr. John Marshall (who, at the time, was Assistant Director of the Eastern Laboratory of the Explosives Department) to the position as Technical Director of the Central Technical Laboratory of the Paint Division at the Gray's Ferry Plant. Mr. Marshall had to start from scratch, because what few records existed, were of little value. Mr. Marshall, therefore, had to build a system that would record what they were then doing and plan from there on for the future.

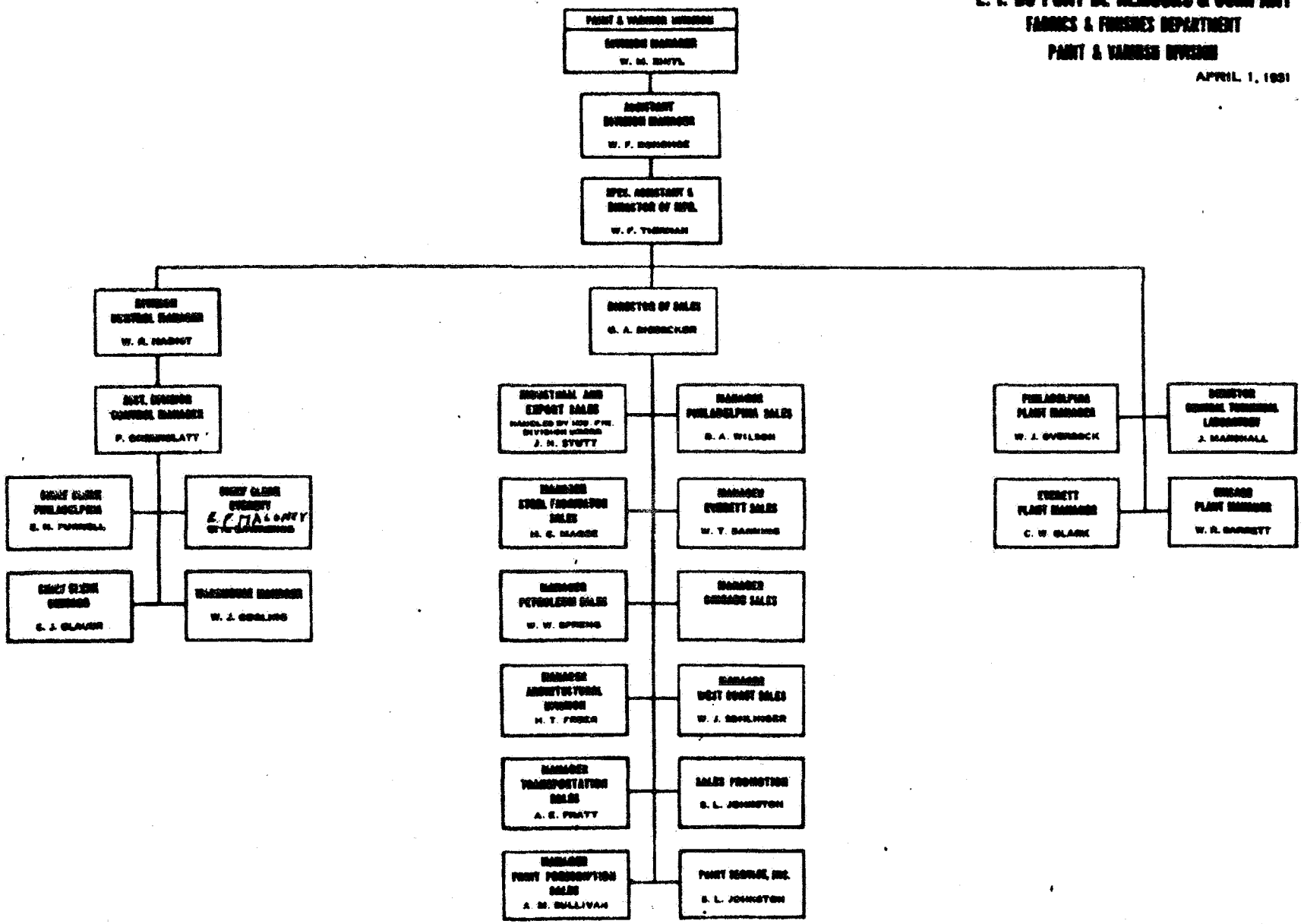
Reference has been made several times to the orthodox practices of the industry and it should be emphasized that at the time Mr. Marshall joined the Department, January 1, 1927, he found Du Pont Products were not comparable to many of the competitive products. But Mr. Marshall was patient and painstaking. He studied the situation, analyzed what the industry was doing, and gradually but steadily, built a system of records and an organization of fine technicians, who specialized in products for specialized industries, and within a

E. I. DU PONT DE NEMOURS & COMPANY

FABRICS & FINISHES DEPARTMENT

PAINT & VARNISH DIVISION

APRIL 1, 1951



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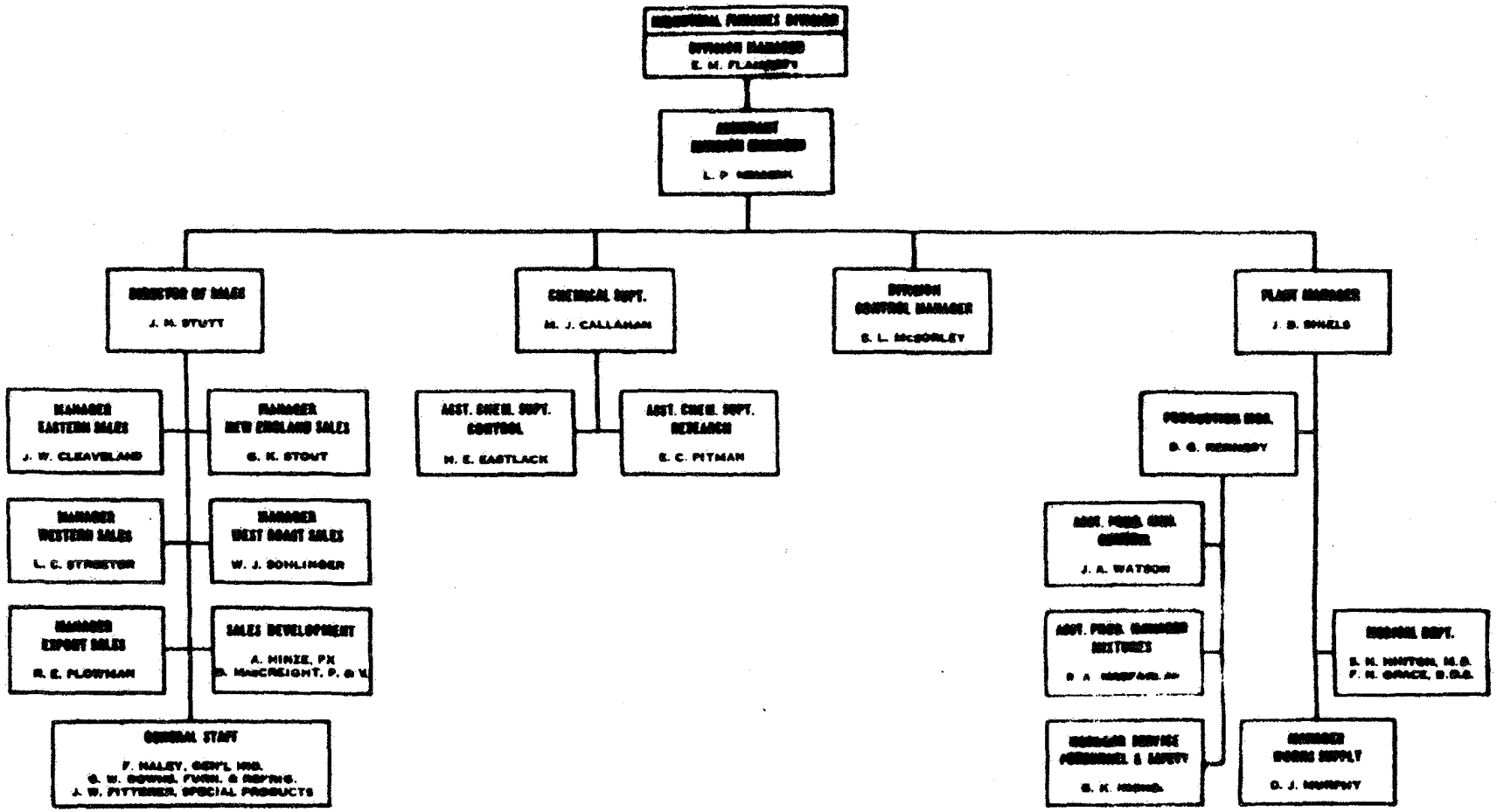
E. I. DU PONT DE NEMOURS & COMPANY

FINISHES & PIGMENTS DEPARTMENT

INDUSTRIAL FINISHES DIVISION

JUNE 1, 1951



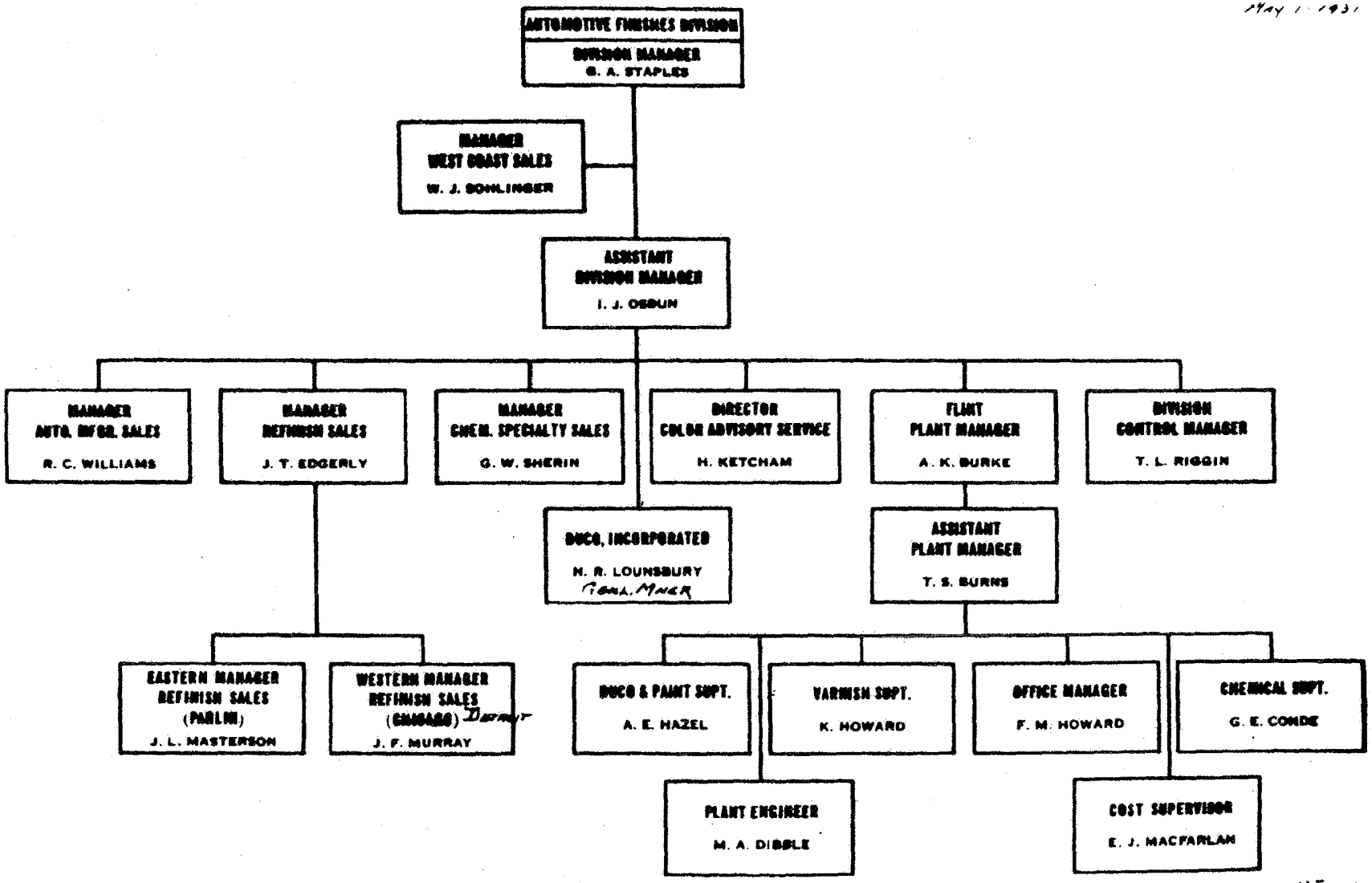
E. I. DU PONT DE NEMOURS & COMPANY

FABRICS & FINISHES DEPARTMENT

AUTOMOTIVE FINISHES DIVISION

JANUARY 1, 1966

May 1, 1971



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DUP030049551

Division, and Mr. L. P. Nemzek was promoted from the position of Director of Sales of that Division to Mr. Flaherty's former position as Assistant Manager.

On April 1, 1929, the Department name was changed from the Paint, Lacquer and Chemical Department to Fabrics & Finishes Department, and three Divisions were established: (1) Paint and Varnish Division, with Mr. W. M. Zintl as Manager; (2) Industrial Finishes Division, with Mr. E. M. Flaherty as Manager, and (3) Automotive Division, with Mr. G. A. Staples as Manager.

But, back to Trade Sales. Someone once made a facetious remark that the Trade Sales Department had the resiliency of a rubber band in that it was always being expanded and contracted. Every time it started to expand, something would happen and "bang" it would contract, and a new start had to be made.

With the change in Management previously referred to, there was an entirely new concept in the Division. A sales policy was definitely formulated, products were improved, confidence was restored throughout the organization, and from then on things began to happen.

In the Fall of 1925, competition having seen what Du Pont did with "Duco" for the industrial world, sensed the chance to capture the consumer market on a household lacquer before Du Pont. In September, 1925, The Glidden Company announced their product "LACQ" for use with a brush that would dry in thirty minutes, and it ignited a spark of interest that quickly became a blaze of activity. Messrs. Allen, Elms and Richter had the same idea as Glidden but were not ready to announce their product because it had not been perfected sufficiently for release. However, because Du Pont were the inventors of "Duco" and because Glidden was quickly gaining distribution,

Du Pont were forced to announce their new consumer product Brush "Duco" for household use on March 6, 1926. See advertisement attached. The appeal of "quick dry" captured the public quickly. The advertising was startling and sensational, just like the original "Duco" ad which first appeared back in 1924. Broadsides announcing the new product were sent to every paint dealer in America and almost instantly the demand for the new product was so great we could not handle the inquiries rapidly enough. Letters and telegrams were pouring in by the thousands. Additional salesmen were promptly employed, but they had to be trained in Du Pont's method of selling, - and knowing the one great weakness of the product - pour brushing (due to the rapid evaporation of the solvents) - women demonstrators were employed and placed in department stores in all the principal cities to try to teach consumers how to "apply" the new product. While steady progress was being made in the improvement of the product, after three years of sensational sales as illustrated by the following figures:

Brush "Duco" Sales

Year		Cumulative Total
1925		
1926	$2,690,000	
1927	3,020,000	
1928	2,444,000	$ 8,154,000
1929	1,512,000	9,666,000
1930	973,000	

it was realized that while Du Pont had the best brushing lacquer on the market there was one thing that could not be accomplished, and that was to change the habits of the women who believed that they were painters. Neither Du Pont nor their competitors selling Brushing Lacquers could break consumers of the habit of brushing out lacquer like they were accustomed to doing with an oil paint, which they could brush and brush and brush. Naturally, this condition slowed up sales and this

Now ... for handy home

DU PONT DUCO

The DUCO you have wanted so long
—ready to BRUSH ON at home

DU PONT DUCO is now ready for you to brush on at home. You yourself can now put on the same finish that you have admired on smart automobiles: the same finish that lends enduring beauty to fine furniture.

DUCO gives that beautiful lustre so much desired to articles in the home: dainty colors that will not fade. It lives quickly and "laughs at time."

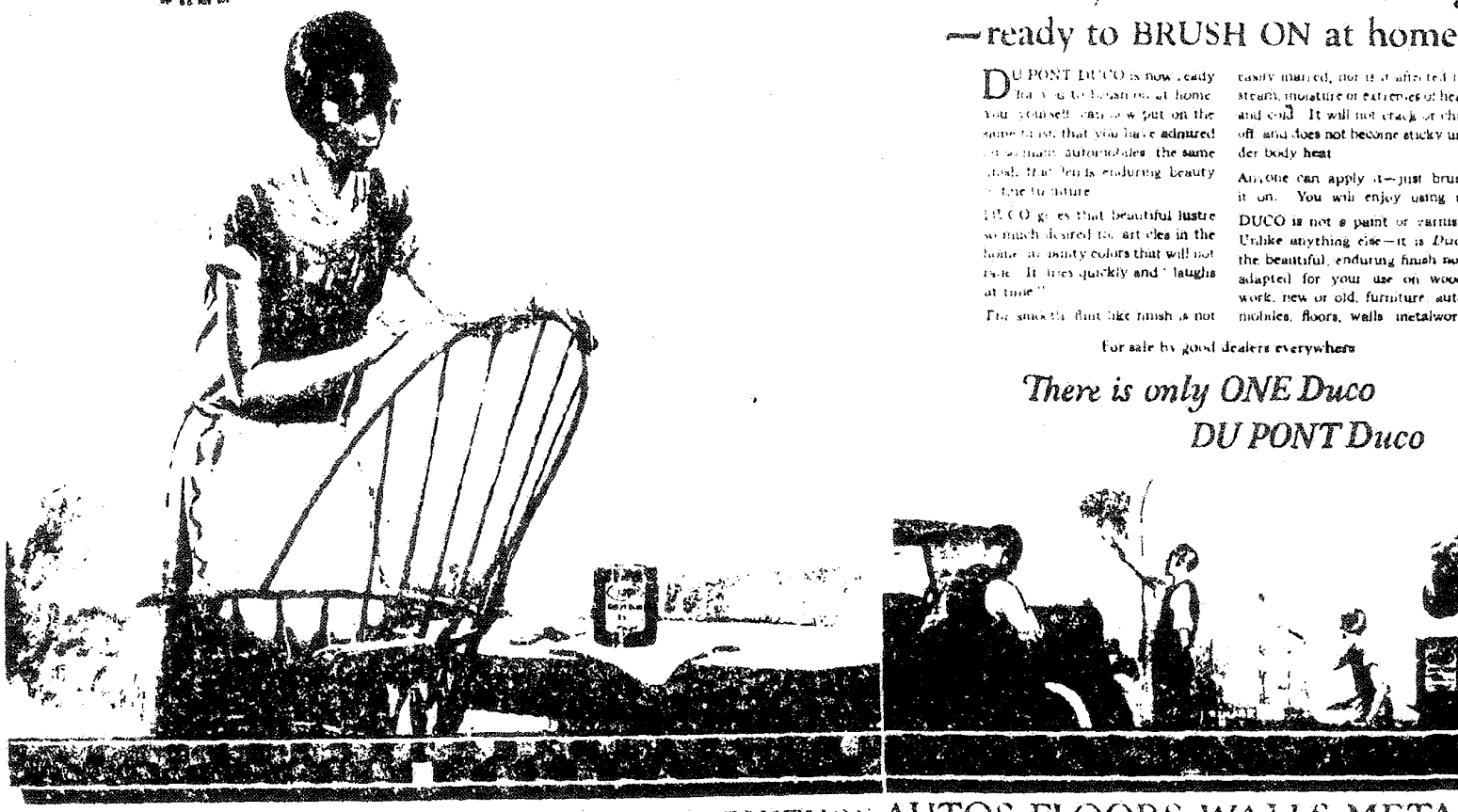
The smooth, flint like finish is not easily marred, nor is it affected by steam, moisture or extremes of heat and cold. It will not crack or chip off and does not become sticky under body heat.

Anyone can apply it—just brush it on. You will enjoy using it.

DUCO is not a paint or varnish. Unlike anything else—it is *Duco*, the beautiful, enduring finish now adapted for your use on woodwork, new or old, furniture, automobiles, floors, walls, metalwork.

For sale by good dealers everywhere

There is only ONE Duco
DU PONT Duco



FOR ALL WOODWORK...NEW or OLD. FURNITURE AUTOS. FLOORS. WALLS. METAL

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auspicious start of getting Du Pont products into nearly every worth while paint store in America turned out to be somewhat of a boomerang.

However, the Paint Department was still confident, because through the temporary success of Brush "Duco", Du Pont had contacted most of the paint dealers throughout America, had sold other Du Pont Paint products and the fact that the Du Pont Company was going to be a real factor in the Paint Industry. Du Pont were now in there and intended to stay.

Du Pont did not dare admit that Brush "Duco" was a failure because it was felt that to condemn Brush "Duco" might interfere with the success of industrial "Duco", but what to do about it was the problem. It was about this time that "Dulux", the new alkyd resin product, began to develop and the Paint group saw the advantage of changing the product within the can. That the product had to be changed was obvious, - but until "Dulux" was perfected for brushing Du Pont reverted to using the conventional type of "quick-dry" product which competitors in the Industry were then using as their offering to meet our competition. Slowly, <u>but steadily</u>, over a period of a year or two, and by skillful merchandising practices, and by changing the product with each day's improvement, - Du Pont retained the good will of the dealers, and today (May, 1947) the present Brush "Duco" is the acknowledged leading specialty. Had the present product been in the can at the time Brush "Duco" was introduced, it is safe to say Du Pont would have not only had a huge volume of sales on Brush "Duco" but it would have more quickly established their distribution of full line dealers and thereby would have saved several years of further struggling to build their sales and distributing outlets.

The reason why it was possible to change the product in the package was because Brush "Duco" was never described or advertised

as a lacquer. It was sold as a finish, whereas Glidden and Sherwin-Williams, the principal competition at the time, sold their product as a lacquer, and as a result they have not been able to reinstate their products under their original name.

The success of Brush "Duco" served as an inspiration to the entire organization, and even though there was the difficulty just referred to, it did not retard or impair the confidence that the organization was developing.

Confidence within the organization became contagious and it was reflecting itself within the trade. As the old saying goes "Confidence begets Confidence".

While Brush "Duco" occupied most of Du Pont's attention during the years 1926, 1927, and 1928, considerable progress was being made in establishing distribution on other Du Pont Paint products.

TREND OF TRADE SALES DISTRIBUTION

About the time the new regime took over, radical changes were taking place in paint distribution methods. Prior to 1920, practically all paint reached the consumer through independent paint or hardware dealers served by wholesalers. Improved roads resulted in greater concentration of purchases in the larger marketing centers and mail order houses began in 1925 to establish their own stores in which the sale of paint was an important adjunct. Department stores and even the syndicate chains started to sell paint and small chains of paint stores, some of whom manufactured their own products locally, were springing up throughout the country. Some large manufacturers, in order to hold their existing business, were forced in the face of this new competition to establish their own stores. This development was automatically reducing the sales potential which heretofore was

available through independent retail outlets, and the Management recognized that Du Pont sales approach had to be changed if they hoped to grow.

Up to this time most of Du Pont's sales were being made to retailers through wholesalers to whom they had to first sell and then to help sell for them. This method of selling was expensive and did not aid in getting the #1 or #2 accounts because the leading type of account was usually tied up by one of the older manufacturers of long association. To break down resistance and to bring about a better appreciation of Du Pont, their products, and their methods, Du Pont maintained a forceful campaign of advertising to the consumer urging that he go to the Du Pont dealer for advice on paint and painting. As time went on, Du Pont made progress in improving its type of representation, and slowly but steadily began to eliminate the wholesaler as an unnecessary and uneconomic factor in their chain of distribution. Such a move as this necessarily took time, because it was a radical departure for only one Department. Other Departments in the Company can and will continue to utilize jobbers - which makes it mandatory that a move of this sort must be made skillfully and tactfully.

To compensate for the service previously rendered by the wholesaler, Du Pont opened a limited number of warehouses, and in 1929 recommended the establishment of their own retail stores in five centers to broaden their distribution, but more particularly to develop their own means of direct selling to both the consumer as well as the dealers in the adjacent territory.

To confirm their own conclusions with respect to opening more stores, the Paint Department employed outside experts, Barrington Associates, to make a study. Barrington recommended that it was essential that the Du Pont Company employ this method of distribution

if they were to hold their place or make any progress in the Trade Sales paint industry. Following is a brief summary of Barrington's comments:

"The trend in the industry is clearly toward more direct selling.

The wholesaler is becoming weaker in his ability to hold the dealer trade.

Wholesalers as well as dealers cannot be relied upon to aggressively promote painter and maintenance business, which are the best outlets for Trade Sales.

Manufacturer-owned paint stores have greater volume and profit possibilities than other forms of distribution.

Du Pont Trade Sales business needs to be safeguarded against being too dependent upon wholesalers."

Du Pont Retail-Wholesale Stores - In 1929; authorization was obtained from the Executive Committee to open five wholesale-retail stores:

Youngstown, Ohio.....September 27, 1929
Columbus, Ohio.....October 15, 1929
Birmingham, Ala.....February 20, 1930
Syracuse, N. Y.....March 13, 1930
Memphis, Tenn.....April 7, 1930.

Du Pont's experience with opening of the stores at the beginning was limited and errors were made, but Management saw real evidence of the practicality of the plan, and progress was well under way when the depression of 1930-1931 gave Trade Sales another severe jolt. Sales were curtailed and expenses kept down, and despite the urge that the stores be closed, the Sales Department maintained that the

stores would justify themselves. Fortunately, they maintained that position, because the stores demonstrated what could be done and served as a foundation for the present large store program.

The following figures clearly demonstrate the soundness and stability of the Du Pont Store program:

In 1930, with 5 stores, gross sales were $169,884 - an average of $33,977 per store -

In 1946, with 52 stores, gross sales were $7,625,927 - an average of $146,652 per store.

The sales through the stores in 1946 were 42% of Trade Sales biggest year, (1944) $15,705,433. This is business that Du Pont built for themselves and is business that competition cannot take away.

During the next few years a number of novel and modern merchandising ideas were introduced to stimulate sales, such as the famous "Paint Parade" featuring Paint Specials with attractive consumer broadsides for local distribution. Millions of these broadsides were sold to the dealers on a 50-50 basis, and not only stimulated consumer interest but really created new alert dealer sales effort. Competition, however, copied this idea very quickly.

THE FAILURE OF "DULUX" HOUSE PAINT

In 1928, with the development of glyptal resins, the Trade Sales Division thought they saw another "Duco". The laboratory had been quietly working on a glyptal base house paint. They had had a number of test panels in Florida, Texas, Colorado and other places, and according to the results shown by the test panels and a very limited number of houses, it appeared that the new type product had 50% better durability than our orthodox products.

With great caution the story was given to the sales group -

with the definite stipulation that the facts should be clearly explained that only the tests indicated the greater durability.

Hoping for another "Duco" - and anxious to again startle the entire industry, the sales organization (early in 1931) started to promote sales, and even though every precaution was taken to control the statements made by the salesmen they neglected to emphasize the qualifying facts and the demand for "Dulux" House Paint became tremendous.

Because of the alkyd resin used, the product was more like an enamel and, therefore, because of the hardness of the film, it was not porous enough to permit moisture to pass through - thereby causing the film to crack badly or to come off in sheets on those houses which were characterized by structural defects, which permitted moisture to get back of the film.

The results were costly and definitely gave the Division a set back with the trade. The one compensating fact was that Du Pont paid the bill for repainting, approximating two hundred and fifty thousand dollars.

But, there is a moral to be drawn from this experience: - Be sure that enough practical experiments are made before releasing a product for sale. The trouble with "Dulux" House Paint was that the facts were based on test panel and a few house exposures - and not enough full house tests.

Reference was previously made to the resiliency of the Trade Sales business - and from the foregoing it should be apparent that the struggle to promote Trade Sales (the most competitive unit of the Industry) was somewhat difficult. But with consistent improvement in products, - the creation of modern merchandising ideas - the opening of Company owned stores, - confidence kept on growing - all of which

resulted in real progress being accomplished.

CONSOLIDATION OF THE PAINT, INDUSTRIAL AND AUTOMOTIVE DIVISIONS AND THE CREATION OF THE REGIONAL OFFICE SYSTEM.

In 1930 - along came the depression - which resulted in a general deflation of sales, and necessitated reducing sales, advertising and merchandising expense. As all business was affected, Management grasped the opportunity of making further economies (with definite advantages to the Department) by consolidating and coordinating the Paint, Industrial and Automotive Divisions. As established at the time, there were three Division Managers and Assistants, three Technical, Production and Control Managers, - three Directors of Sales, and two Advertising Managers, etc. It was decided to combine the three Divisions and to transfer the Executive group (excepting the Automotive Sales group, which remained in Detroit, because that city is Automotive headquarters), to Wilmington under the general term of Finishes. That happened on November 1, 1932.

The change resulted in moving the following staff to Wilmington:

Messrs. E. M. Flaherty and W. M. Zintl who were appointed Director of Manufacture and Sales, respectively.

Messrs. M. J. Callahan and W. F. Donohoe who were appointed Chemical Director and General Sales Manager, respectively.

Mr. M. V. Hitt was appointed Director of Production.

Mr. H. E. Lackey " " " " Industrial Sales.

*Mr. M. Denning " " " " Trade Sales.

Mr. J. T. Edgerly " " " " Refinish Sales.

Mr. G. W. Sherin " " " " Chemical Specialty Sales.

Mr. Ralph Plowman " " " " Export Sales.

Mr. S. L. Johnston " " Advertising Manager.

*Mr. Denning was drafted from his position as Assistant Advertising Director of the Du Pont Company.

ORGANIZATION CHART

FABRICS & FINISHES DEPARTMENT - E.I.DU PONT DE NEMOURS & COMPANY

- General Manager - Wm. Richter
  - Asst. General Manager - J. J. Moorhann
    - Control Manager - H. S. Risler
  - Fabrics Division
    - C. W. Weaver - Division Manager
      - E. S. Nickerson - Asst. Division Manager
        - E. S. Nickerson - Director of Sales
        - Wm. Fulton - Control Manager
        - H. C. Graebner - Newburgh Plant Manager
        - E. R. Cathcart - Fairfield Branch Manager
          - M. N. Nickowitz - Fairfield Plant Manager
  - Finishes Division
    - G. A. Staples - Manager Automotive Division
    - W. M. Zintl - Director of Sales
      - Matt Denning - Director Trade Sales
      - H. E. Lackey - Director Industrial Sales
      - J. T. Edgerly - Director Refinish Sales
      - G. W. Sherin - Director Chemical Specialties Sales
        - Dir. Advertising, Promotion & Market Analysis
      - W. F. Donohoe - General Sales Manager
        - J. H. Stutt - Eastern Sales Manager
          - B. A. Wilson - Eastern Trade Sales Manager
          - J. W. Cleaveland - Eastern Industrial Sales Manager
          - A. E. Pratt - Eastern Transportation Sales Manager
          - H. R. Lounsbury - Eastern Refinish Sales Manager
          - W. W. Spreng - Eastern Petroleum Sales Manager
          - M. C. Magee - Eastern Steel Sales Manager
        - S. B. Woodbridge - New England Sales Manager
          - G. K. Stout - New England Industrial Sales Manager
          - D. E. Goldich - New England Refinish Sales Manager
        - I. J. Osbun - Southern Sales Manager
          - W. T. Banning - Southern Trade Sales Manager
          - J. H. Gruss - Southern Industrial Sales Manager
          - G. F. Baldwin - Southern Refinish Sales Manager
        - L. P. Nemzek - Western Sales Manager
          - G. A. Biebecker - Western Trade Sales Manager
          - L. C. Streeter - Western Industrial Sales Manager
          - F. H. Crawford - Western Transportation Sales Manager
          - J. L. Masterson - Western Refinish Sales Manager
        - W. J. Bohlinger - West Coast Sales Manager
        - R. E. Plowman - Export Sales Manager
    - E. M. Flaherty - Director of Manufacture
      - M. J. Callahan - Chemical Director
        - Patents - F. Knipper
        - John Marshall - Asst. Chemical Director
          - John Marshall - Director Philadelphia Laboratory
          - H. E. Eastlack - Director Parlin Laboratory
          - A. E. Conde - Director Flint Laboratory
      - M. V. Hitt - Director of Production
        - Works Supply - W. F. Malloch
        - J. D. Shiels - Parlin Plant Manager
        - W. F. Tiernan - Philadelphia Plant Manager
        - A. K. Burke - Flint Plant Manager
        - W. R. Barrett - Chicago Plant Manager
        - C. W. Clark - Everett Plant Manager
  - H. S. Risler - Control Manager
    - S. L. McSorley - Asst. Control Manager

Regional Offices were established in:

Philadelphia, Pa.	with	Mr. John H. Stutt	as	Regional	Manager
Chicago, Ill.	"	Mr. L. P. Nemzek	"	"	"
Boston, Mass.	"	Mr. S. B. Woodbridge	"	"	"
Atlanta, Ga.	"	Mr. I. J. Osbun	"	"	"
San Francisco, Cal.	"	Mr. W. J. Sohlinger	"	"	"
Detroit, Mich.	"	Mr. G. A. Staples as Manager of Automotive Department.			

Industry Managers were appointed for each Branch Office and Managers for each Plant. For names and locations see attached organization charts. The small charts - representing the alignments before the change and the larger chart dated November 1, 1932 representing the final line-up.

The wisdom of this change was quickly apparent -

First of all it unified the entire organization and centralized control in Wilmington.

It definitely eliminated all internal competition between Lacquer and Paint.

It enabled the Managers in charge of the respective Divisions to organize policies, prices, products and plans.

It broadened the viewpoint of every one in the Department who began to comprehend the breadth and scope of the industry and Du Pont's part therein.

It permitted specialization and concentration in selected industries.

It permitted the Regional Managers to apply their time and attention to each industry as conditions warranted.

It definitely fixed regional responsibility for the intensive

development of the potential of each Division.

Du Pont is the only company in the industry organized this way and it is a fact that this principle has had considerable to do with their distinctive position in the industry.

By this specialized arrangement, the Trade Sales group handle their problems in keeping with their competitive conditions. The Refinish group sell in a different field and follow their competitive practices. The Automotive group are specialists in sales and service and confine their activities entirely to that one field because of its size and importance. It was an outgrowth of the Flint purchase, and with the invention of "Duco"(and the problems being specifically automotive) a complete organization is maintained in Detroit.

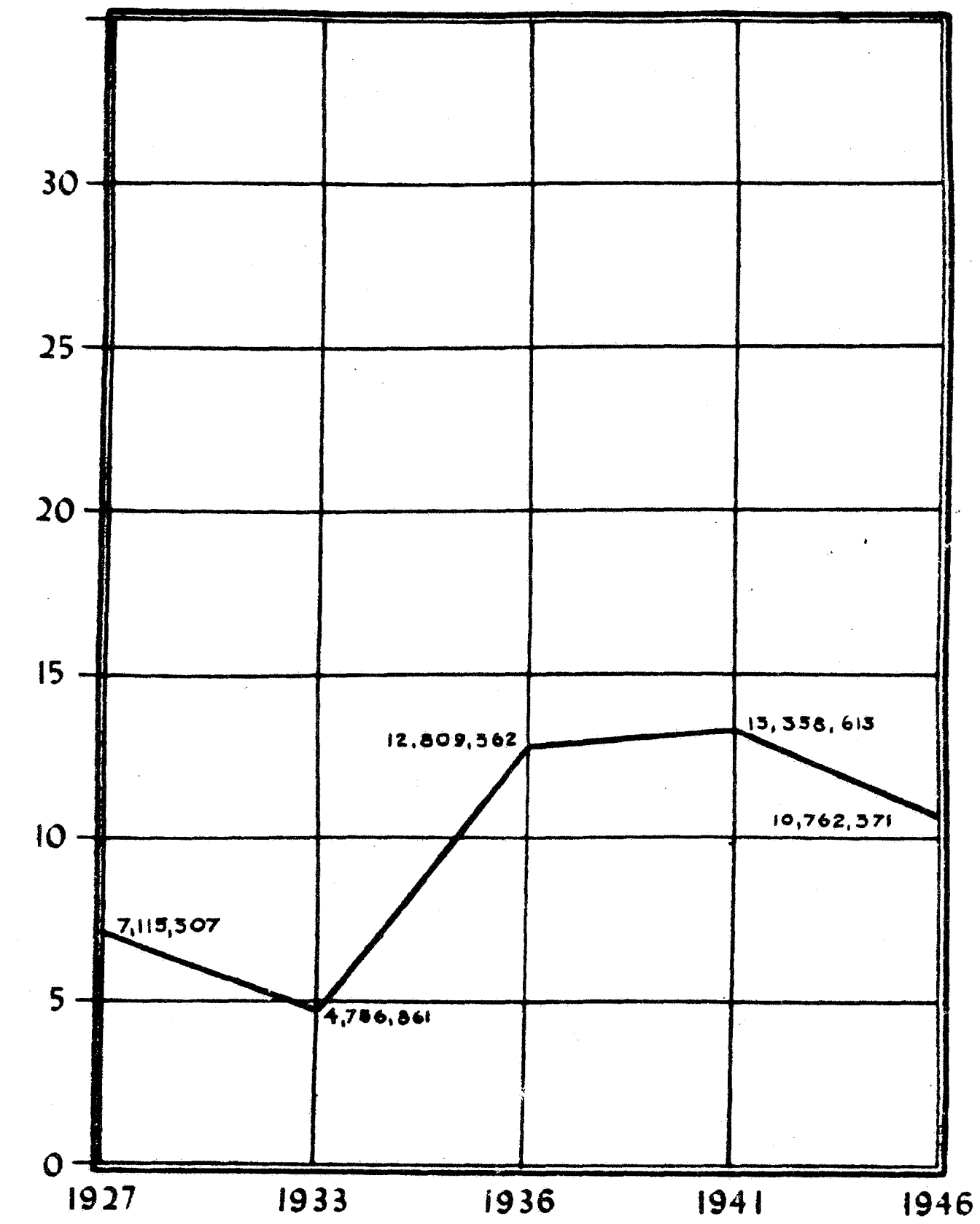
The Industrial group have their particular problems, but their policy prevents conflict or overlapping with the other Divisions. ("Industrial" means a grouping of all industries who use finishes on products or equipment.)

Unlike Trade and Refinish Sales who have more or less standardized lines to offer their customers, Industrial selling is highly specialized, - somewhat similar to selling an Engineering Service because nearly all products are tailor made for the particular manufacturer or Industry being served.

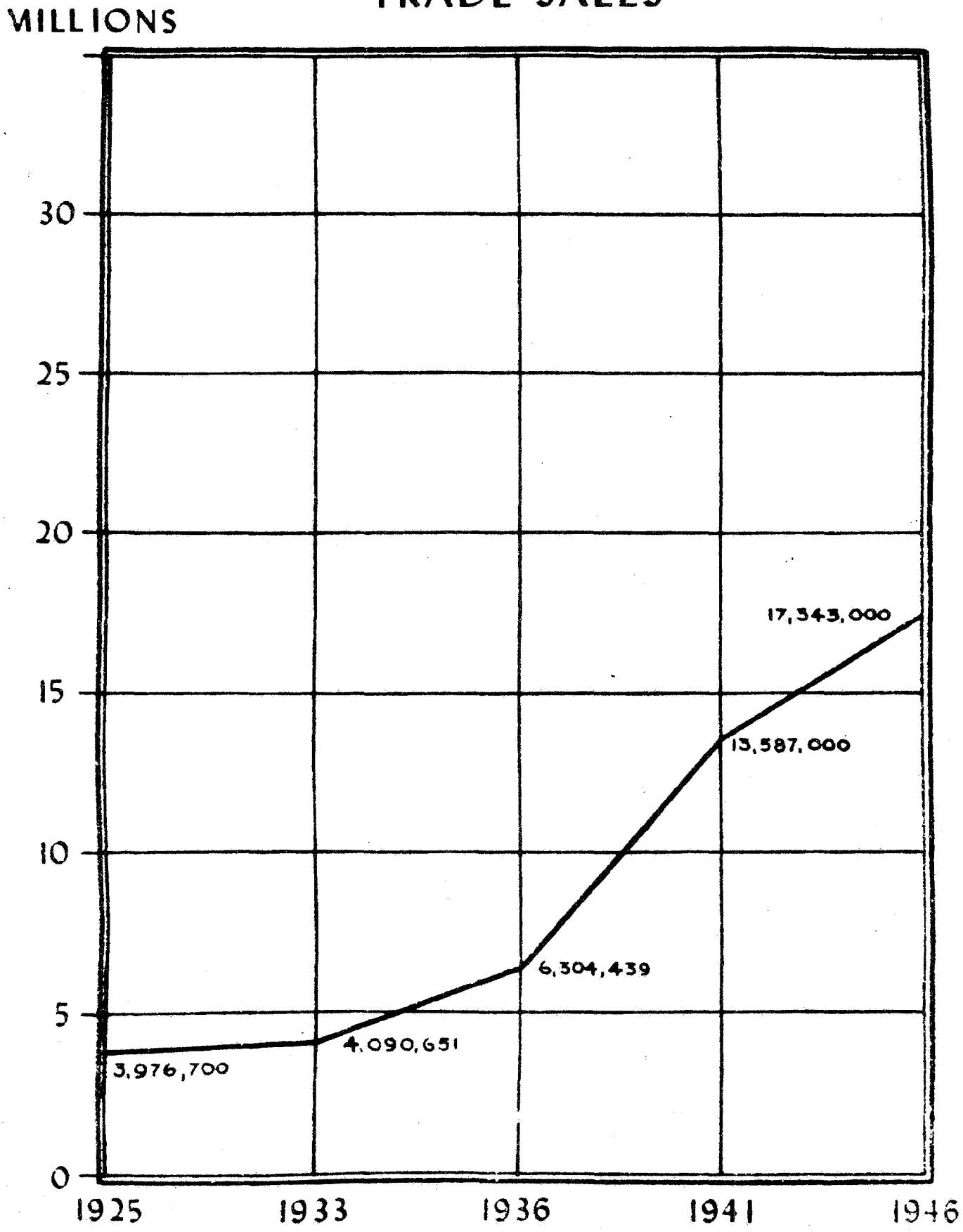
Du Pont was and still is unique in this sales approach, - although competition is beginning now to follow the same principle. But proof of the results of this "Engineering" approach is shown by these (1941) facts:

Du Pont	obtained	75%	of	all	Finishes	used	in	the	Refrigerator	Industry
"	"	60%	"	"	"	"	"	"	Kitchen Cabinet	"
"	"	30%	"	"	"	"	"	"	Washing Machine	"
"	"	90%	"	"	"	"	"	"	Metal Sign	"

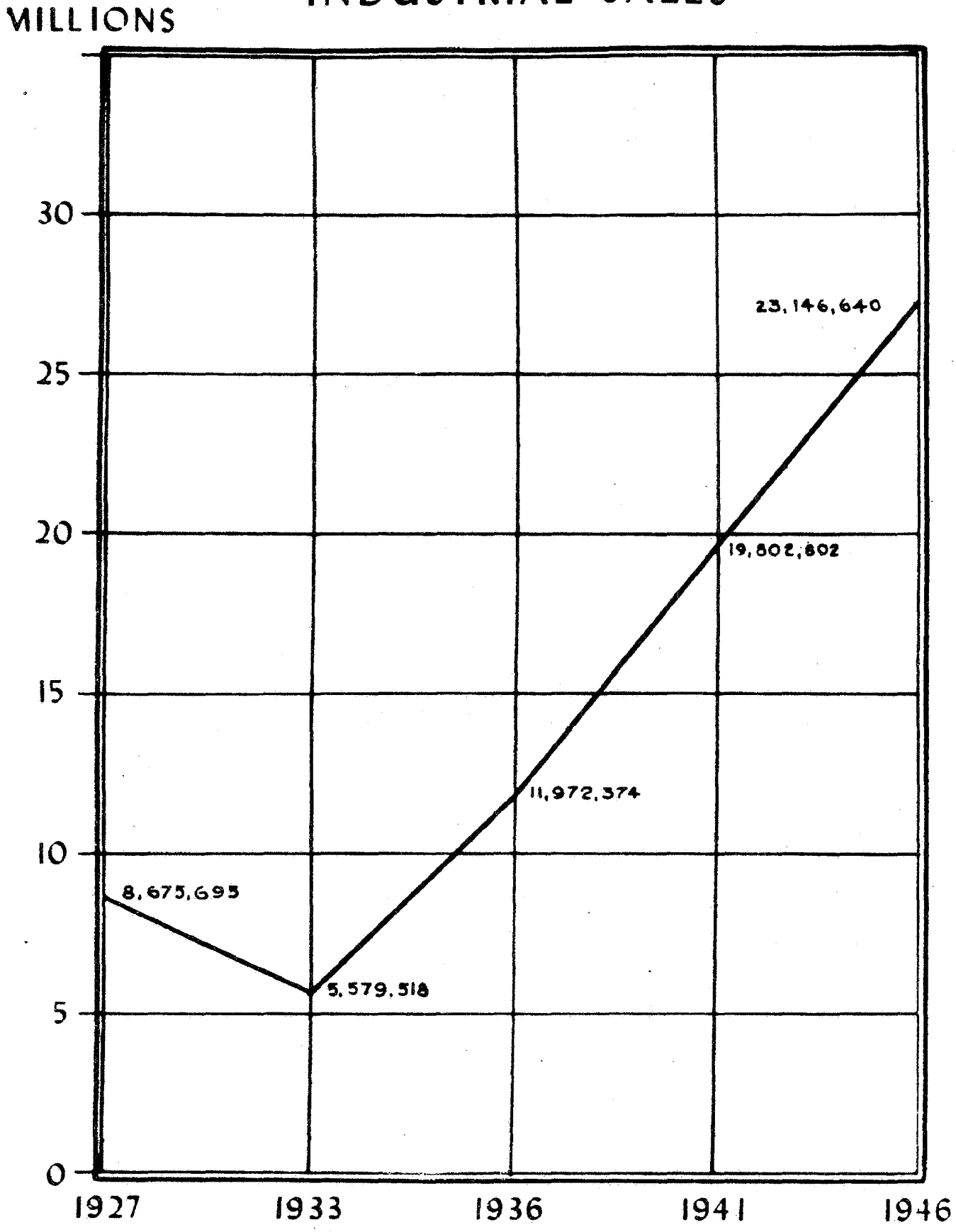
AUTO MANUFACTURERS



TRADE SALES



INDUSTRIAL SALES



A big job still remains to be done in such industries as furniture, wall tile, Venetian blind, wire coating, and others where the potential is large.

But Du Pont is headed in the right direction for three good reasons - First, they know their markets. Second, they have the technical skill to develop the products. Third, they have the system for developing the right kind of salesmen to approach these markets.

Messrs. John H. Stutt and H. E. Lackey deserve most of the credit for developing and building the largest Industrial volume in the industry.

In the recent consolidation it should be recorded that Mr. M. Denning succeeded Mr. G. A. Biesecker as Director of Trade Sales. This was because the Western Region (Chicago office) which offered the greatest potential growth and was not progressing as it should, made necessary a change in Management. Chicago, being the biggest problem in the department, called for the most experienced man available. After reviewing all the probable candidates, it was unanimously agreed that Mr. Biesecker was the best qualified to give it the drive needed. Mr. Biesecker went to Chicago in 1931 and was there at the time of the consolidation (November, 1932). Because his efforts were getting results it was decided to keep Mr. Biesecker in Chicago. This left the Director of Trade Sales post open, to which Mr. Denning was appointed. Mr. Denning had previously been Advertising Manager at Parlin (during the height of the "Duco" development) and served several years as Assistant Advertising Director of the Company.

Just coming out of the depression (during which period the Trade Sales Division was in red figures) imagination and creative ability were vital necessities. Mr. Denning, possessing these

qualities, added the inspiration and spark that was needed to keep Trade Sales moving forward and at the same time earn some profit. For five years (from 1932-1937 and often referred to as the "Profit Making" period) every effort was being made to hold what business they had and build on top of that with the least possible expense. That was a critical period in the history of Trade Sales - when it was proven that a profit could be made.

In 1937, after several years of field testing, the Technical Department announced the release of an improved Outside White for Exterior Painting, the base of the new product being Titanium Dioxide. In 1938, the first advertisement was run featuring "the Paint that Cleans itself". But, like all other good things, unless one is covered by patent, competition quickly learns the art of imitating both the product and your sales theme. However, the sales on this new product were growing steadily when the war of 1941 came along and restricted the use of Titanium. Once again the "rubber band" was contracted. But this improved and modern product can be the keystone around which future Trade Sales promotional plans can be built.

(Parenthetically, it might be stated here that this new product just about kills the long-established prejudices of the painter in his insistence for White Lead and his refusal to accept ready-mixed paint which the Trade Sales industry had to fight for many, many years.)

Coincident with the development and promotion of Outside White, Du Pont were steadily promoting the sale of other outstanding specialties such as "Duco", - "Dulux" Super White, - the finest of all interior enamels, - Trim & Trellis Colors for shutter painting - outstanding for their color retention and mildew-proofness, - and an improvement

in all their general line which was going on steadily since the creation and development of the Central Technical Laboratory back in 1927. QUALITY is the outstanding characteristic of the present Du Pont line of Paints and Varnishes, and it can be said without reservation that no other manufacturer excels the present line and but few compare. Both the trade and public are recognizing this superiority and when raw materials are again available the struggle of the past 20 years in building Trade Sales will more than justify the effort. As the old saying goes - there is no substitute for QUALITY.

NEW REGIONAL OFFICES

Because the Southern Region was so extensive and because it was growing so steadily under the new regional office system, on July 1, 1936, a sub-office was opened at Dallas, Texas, with Mr. G. F. Baldwin in charge. The branch continued to grow and on Mr. Osbun's death in 1940, Management appointed Mr. W. T. Banning as Regional Manager at Atlanta and created Dallas as a new Regional Office with Mr. J. L. Masterson as Manager. Atlanta was then termed the Southeastern Branch and Dallas the Southwestern Branch.

Similarly, the Western Region at Chicago was getting too large, and on January 1, 1946, Chicago was split and a new regional office was created at Cleveland, with Mr. J. L. Masterson in charge.

While products and their quality are important, new ideas and new methods must necessarily be employed to keep the salesmen and dealers stimulated and more particularly to keep ahead of competition. Mention was made previously of the Paint Parade, but of the more recent sales innovations there was the transformation of furniture with the use of "Duco" by the famous Peter Hunt of Provincetown, Mass. This was an original idea of this artist who took old furniture, transformed it into

modernistic pieces, finished them with brush "Duco" and built a nation-wide reputation for himself. So unique was Mr. Hunt's idea that he was featured in LIFE Magazine, since which time Du Pont has capitalized on the advantage of "Transformagic". Millions of copies of the book "Transformagic" have been distributed through dealers.

Another and much broader idea is Color Conditioning for Industry which is a complete Painting Program scientifically developed to promote efficiency, to increase production, to improve quality, to reduce personal injuries and to foster better Employee-Management relationship. Color Conditioning for Industry represents the combined experience of the Du Pont Company and Faber Birren, nationally known industrial color authority. It had its beginning some 16 years ago in the hospital field where scientific studies of color were made to aid the visual acuity of the surgeon. Similar investigations were later performed in the school field and in factories. In 1937-8, experiments were carried out in one of the first nation-wide applications of color to industry--scientific standards being established and applied to automotive plants throughout America.

In 1940, Du Pont, with the cooperation of Arthur A. Brainerd of the Philadelphia Electric Company, perfected its "Three-Dimensional Seeing" program and announced it before the 35th Annual Convention of the Illuminating Engineering Society. Since then, thousands of American firms have made use of "Three-Dimensional Seeing" in adding to the efficiency of their machine operations.

In 1941, Du Pont completed its study of "Salvaging Waste Light", which was announced at the Wartime Lighting Conference of the Illuminating Engineering Society and which reviewed the functional value of color as applied to the entire facilities of industry.

Meanwhile the whole science of color in industry has received

increased recognition -- with Du Pont acknowledged as the pioneer and leader in its advancement.

This fact is well verified by the editorial recognition accorded to the work of the Du Pont Company and Faber Birren by important national magazines.

This brings us right up to 1941 and the war.

From 1941 to 1946, the normal routine of developing business had to be put to one side and the program arranged to meet war conditions.

Except for war work, allocations and restrictions were the order of the time.

The only fact of real import was the change in organization which occurred in October, 1944.

Mr. William Richter, General Manager of the Fabrics & Finishes Department retired as of that date, and was succeeded by Mr. J. Warren Kinsman.

Mr. Kinsman quickly appraised the whole Department and immediately inspired and strengthened the entire organization by supplementing each Manager in a key post, with an Assistant. This relieved the burden that most of the key men were carrying, while protecting each post with someone to carry on in case of loss.

Mr. Kinsman also created new posts for Messrs. Flaherty and Zintl, as Manager and Assistant Manager, respectively, of the Finishes Division. These moves in turn created opportunities for many men in line who were waiting for years to move forward.

In November, 1944, Mr. W. F. Donohoe who had just been appointed Director of Sales, died suddenly while on a trip to Chicago. This unfortunate and untimely death of Mr. Donohoe necessitated a number of adjustments, - and the action of Mr. Kinsman in appointing Assistants

more than justified itself at the very start of his regime.

Mr. J. J. Moosmann, who had been Assistant General Manager since 1928, retired on December 31, 1945, after 46 years of service. Mr. Moosmann was succeeded by Mr. E. S. Nickerson who was, at the time, Assistant Manager of the Fabrics Division.

In June, 1945, Mr. E. M. Flanerty became ill and after a year's absence retired in July, 1946, after 33 years of service.

In April, 1947, Mr. G. A. Biesecker, former Chicago Regional Manager, retired from service after 41 years of service. Mr. David E. Goldich succeeded Mr. Biesecker.

FABRICS & FINISHES DEPARTMENT - E. I. DU PONT DE NEMOURS & COMPANY

May 1, 1947

- GENERAL MANAGER - J. WARREN KINGMAN
  - STAFF ADVISOR - W. M. ZINTL
  - ASSISTANT GENERAL MANAGER - E. B. NICKERSON
    - CHEMICAL DIVISION - DIRECTOR - JOHN MARSHALL
      - ASSISTANT DIRECTOR - J. DORMAN MCBURNEY
        - EXECUTIVE ASSISTANT - H. E. EASTLACK
        - FAIRFIELD LABORATORY - DIRECTOR - A. F. SCHILDHAUER
        - FLINT LABORATORY - DIRECTOR - R. B. DAVIS
        - NEWBURGH LABORATORY - DIRECTOR - R. E. THOMAS
        - PARLIN LABORATORY - DIRECTOR - G. E. CONDE
        - PHILADELPHIA LABORATORY - DIRECTOR - J. B. BULLITT, JR.
        - PATENT SECTION - MANAGER - P. B. COCHRAN
        - FIELD RESEARCH SECTION - MANAGER - H. J. HAON
    - FABRICS DIVISION - MANAGER - M. J. CALLAHAN
      - ASSISTANT MANAGER - J. R. BUCKLEY
        - FAIRFIELD PLANT - MANAGER - E. R. CATHCART
          - RUSSELL PLANT - SUPERINTENDENT - M. J. VITTENGL
        - NEWBURGH PLANT - MANAGER - H. S. CLEMENS
        - SALES SECTION - DIRECTOR - M. N. NICKOWITZ
          - FABRIKOID SALES - MANAGER - H. L. HOPKINS
          - FAIRFIELD PRODUCTS SALES - MANAGER - J. R. OVENS
          - RETAIL SALES - MANAGER - G. C. JENNINGS
          - AUTOMOTIVE SALES - MANAGER - A. L. BROWN
          - ADVERTISING - MANAGER - P. R. PRICE
          - EXPORT SALES - MANAGER - R. J. WILSON
        - CONTROL SECTION - MANAGER - H. EDWARDS
    - FINISHES DIVISION - MANAGER - H. H. HOPKINS
      - ASSISTANT MANAGER - MATT DENNING
        - PRODUCTION SECTION - DIRECTOR - A. K. BURKE
          - ASSISTANT DIRECTOR - M. A. DIBBLE
            - CHICAGO PLANT - MANAGER - C. W. CLARK
              - FORT MADISON PLANT - SUPERINTENDENT - H. F. BODIN
            - EVERETT PLANT - MANAGER - C. D. NEFF
            - FLINT PLANT - MANAGER - H. E. MONK
            - PARLIN PLANT - MANAGER - L. H. FRIDAY
            - PHILADELPHIA PLANT - MANAGER - D. G. KENNEDY
            - SAN FRANCISCO PLANT - MANAGER - P. J. GRIFFIN
            - TOLEDO PLANT - MANAGER - E. E. FURST
        - SALES SECTION - DIRECTOR - H. R. LOUNSBURY
          - ASSISTANT DIRECTOR - J. W. NESTOR
            - DEVELOPMENT - MANAGER - S. L. JOHNSTON
              - ASSISTANT MANAGER - D. V. BAUDER
            - EXPORT SALES - MANAGER - R. E. FLOWMAN
            - INDUSTRIAL SALES - MANAGER - H. E. LACKEY
              - ASSISTANT MANAGER - J. B. DIETZ
            - REFINISH SALES - MANAGER - R. R. ALLEN
              - ASSISTANT MANAGER - H. H. HODGE
            - SPECIALTIES SALES - MANAGER - G. W. SHERIN
              - ASSISTANT MANAGER - H. R. LATOWSKY
            - TRADE SALES - MANAGER - S. L. MCSORLEY
              - ASSISTANT MANAGER - C. P. CULP
            - AUTOMOTIVE SALES (DETROIT) - MANAGER - R. C. WILLIAMS
              - ASSISTANT MANAGER - E. L. THEURER
            - BOSTON REGION - MANAGER - S. B. WOODBRIDGE
              - INDUSTRIAL SALES - MANAGER - G. K. STOUT
              - REFINISH SALES - MANAGER - K. Y. WRIGHT
              - TRADE SALES - MANAGER - L. D. HORSMAN
            - PHILADELPHIA REGION - MANAGER - [illegible]

CONCLUSION

In concluding this history of the Du Pont paint business, there are some facts that stand out - some principles established that are landmarks for future progress. It is our purpose to record these briefly here.

The growth of the paint industry during the period of Du Pont's association with it has been remarkable, as the following figures attest:

1914 -	855	manufacturers	doing	a	volume	of	$ 149,000,000
1922 -	1,200	"	"	"	"	"	$ 300,000,000
1946 -	1,500	"	"	"	"	"	$ 900,000,000

From this record of growth, it is readily apparent that a billion dollar industry is both possible and probable in the not too distant future.

As regards this growth, it can be truthfully said that Du Pont's contribution in lacquer and synthetic products has had a very large influence. Further, it can be said that these developments changed the very nature of the industry - from an orthodox business to a now definitely chemical industry.

As to Du Pont's own growth in the paint business, the attached chart for the period from 1922 to 1946 shows this progress graphically in comparison with the growth of the industry. The industry growth has recorded a 201% increase, compared with an increase of 759% for Du Pont.

It is the writer's opinion that this Du Pont achievement spells real progress - progress that would not have been possible without the finest and closest kind of cooperation between all of the departments involved - technical, production, and sales. In these groups there were no temperamental stars - no stellar

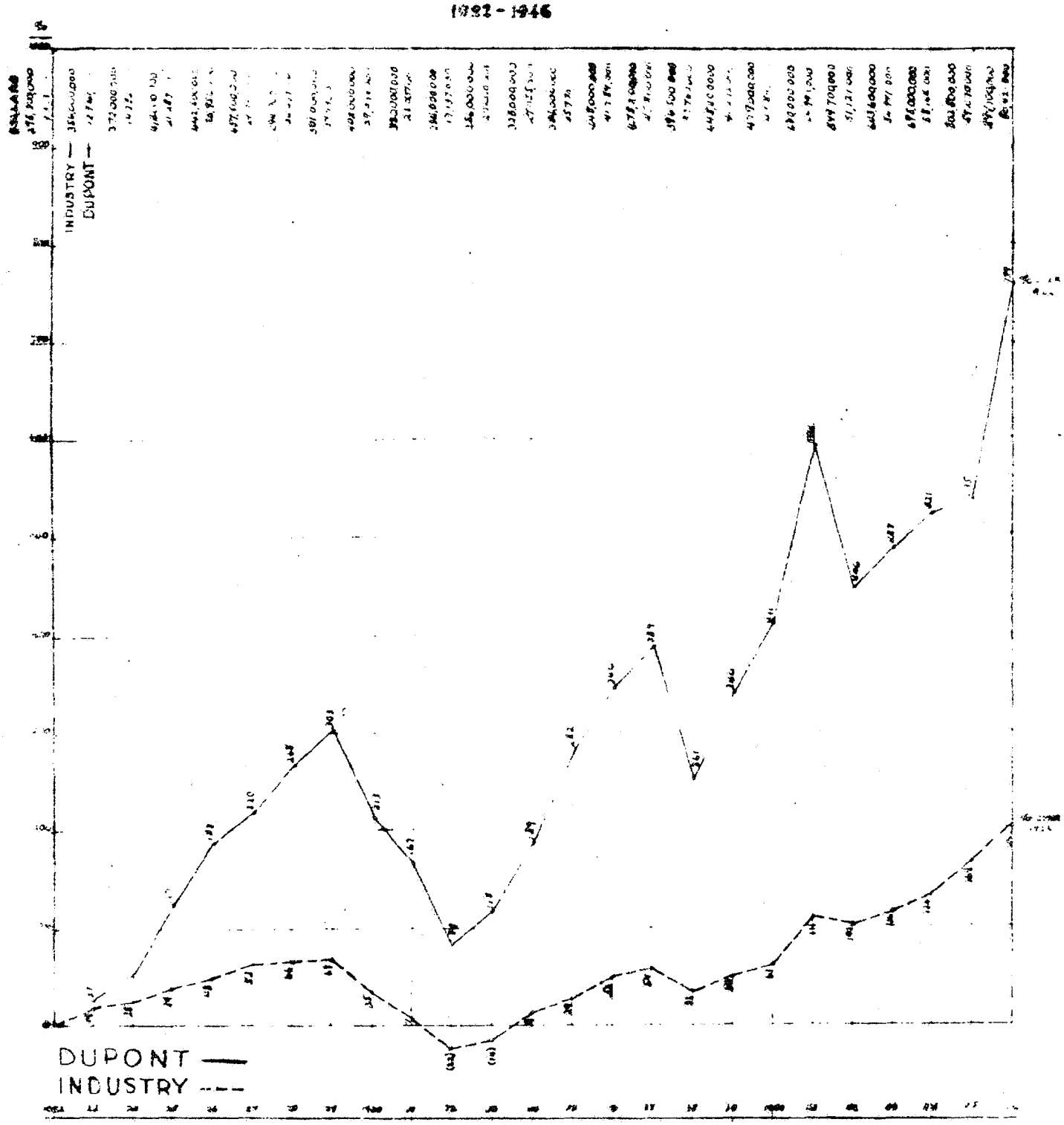
performers demanding top billing - but a unified cast performing together in complete unity, notwithstanding the many vicissitudes with which the department had to contend.

This history leaves no question about the stability and earning power of the Industrial and Refinish Divisions, because in those fields Du Pont has achieved unquestioned leadership and sets the pace for the industry. As for the Trade Sales section of our business, which is the most highly competitive portion of the industry, we are over the crest of the hill and future progress will depend entirely on the amount of effort Du Pont puts behind it.

And now, a final word about this paint business of ours which operates as the Finishes Division. True, it is made up of apparently separate component parts - Trade, Industrial, and Refinish - yet history bears out the fact that each is dependent upon the other. The technical and production problems are one and the same, and the only true distinction is in the selling effort, which was purposely planned for greatest results through specialized selling. Let not any one of us belittle this principle.

This, then, is the history to date - the end of what has passed, but only the beginning of still greater history yet to be written.

DU PONT FINISHES VS. THE PAINT INDUSTRY
1922 - 1946



VOLUME 2

FOREWORD

In May, 1947, W. M. Zintl – occupying the position of Staff Advisor to the General Manager – concluded a task which undoubtedly consumed many long hours of research work. The result of that effort was publication of a looseleaf "History of the Du Pont Paint Business" – in essence the evolution of the Finishes Division of the present F. & F. Department.

That record is of interest and value. Due to the many changes in organizational structure, including the acquisition of new companies and their integration with Du Pont and the relocation of headquarters offices for some segments of the business, much of the information which was contained would be difficult if not impossible to reconstruct without the first-hand knowledge that contributed so much to Mr. Zintl's account.

It should be noted here that W. M. Zintl died in October, 1960, at the age of 75. He had had a long and distinguished business career and had become one of the most widely known and respected figures in the paint industry.

To carry this historical record forward from 1947 to the present is the purpose at hand.

The period here covered is one of full maturity for the Finishes Division. There have been new names on the organization charts as issued periodically and some changes in organizational structure but basically the business has been conducted along similar lines for these past 15 years. As a consequence, the present account is concerned more with orthodox growth than with dynamic change, less with new directions of effort and more with statistics than with individuals, all of which is a natural result in a business which has passed from the formative to the consolidation stage.

Taking each major segment of the business, an effort has been made to chart the sales and earnings growth for the period under study and to attribute reasons for important change. In a business as large and as complex as F. & F. Finishes has become, a lengthy volume undoubtedly could be written describing the development of each phase of activity. This would be of some interest but is not this writer's conception of the documentary which is desired. If a more

detailed record of certain aspects is felt needed, various best qualified individuals can be called upon to supplement this brief and comprehensive summary of what appear to be the most significant milestones in the course of "post-World War II" Du Pont Finishes history.

In compiling the statistics used in the charts and the narrative, every effort was made for accuracy. In addition to the possibility of simple error, however, there are some areas wherein changes in accounting or reporting practices have been made during the course of the period studied with possible effect on the comparisons shown. Reference to the "Chart Notes" should be made in all cases.

Numerous individuals have contributed information which is embodied in this account and their assistance is gratefully acknowledged. I should like to particularly thank the following men for their help in this connection: R. R. Allen, L. S. Baker, D. V. Bauder, E. N. Brown, P. B. Cochran, R. B. Davis, D. L. Herndon, H. H. Hodge, J. A. Klacsmann, H. E. Matter, D. McBurney, G. I. Mulholland, J. C. Parker, G. H. Sutton and H. R. Young.

With regard to some "editorial observations" which are made in a few places, the expression of a personal point of view is one of the few privileges which rewards an effort of this kind. Realizing that this is done from a limited perspective, no claim for omniscience is made. Similarly, comments on a few personalities are expressed which reflect no one's opinion but my own. No eulogies of men currently active in the business are attempted simply because their role must be evaluated after their business careers have been concluded.

A task of this kind involves an amount of research effort considerably out of proportion to the rather sketchy account which results from it. It has been done over a period of several months in odd hours as opportunity provided. That fact may be responsible for some lack of good continuity in much of the reporting.

The development of Du Pont's paint business has been a good example of American enterprise and is certainly representative of the Du Pont Company's growth and expansion over the past half century. It is hoped that when the next chapters are added to this saga they will report on accelerated progress in earning both profit and prestige for Du Pont.

February 1962

GEORGE F. BALDWIN

GENERAL

Du Pont's progress in the paint business during this span of years can best be viewed by reference to the charts which accompany this account. Because earnings from the business and penetration in the industry are also measurements of progress, these indices are used along with sales volume.

The charts show Du Pont paint volume increasing from slightly over $100MM in 1947 to a peak of almost $160MM in 1955. During this period the operative earnings' ratio for the Finishes Division varied from a high rate of 22.5% of net sales in 1950 to a low of 12.8% in 1958. Penetration - or progress versus the paint industry - suffered a decline from about 11.6% in 1950 to the low of 8.1% in 1958, from which point some recovery is now evident.

A summary view of the period under study might make note of several general factors which may not be fully apparent in the more detailed accounts of the industry segments which follow.

During 1947 and 1948, war-caused shortages of some raw materials and equipment items continued to plague business effort. In 1947 the labor supply for manning some plants was still critical. There was a continued upward trend of prices for all goods and services.

1947, however, saw the paint industry reach one billion dollars annual sales volume for the first time. The same volume was sold in 1949, a take-off point from which dollar sales of the industry would climb 80% in the next ten years.

In 1950 the Korean conflict erupted and another period of business abnormality followed. While sales and profits mounted sharply, this was a period of serious production problems, with some raw materials in short supply. This had the inevitable corollary of sales problems with customer complaints and sales frustrations. As in the immediate post-war era, material shortages made necessary an arbitrary allocation of available supplies between industries served. Because of the importance of the business to F. & F., automotive manufacturing needs were again given first priority, a policy which handicapped improvement of our position in other fields.

In 1955, Du Pont paint dollar sales reached an all-time high of almost $160MM, due almost entirely to record automobile production and our continued good participation in that

industry. This also represented the largest gallonage of pigmented products which had yet been produced but it should be noted that the excess in gallonage production over the previous high volume year (1950) was a modest 4% whereas the dollar increase for the comparable years was 18%, indicating the inflationary effect which had been increasingly evident since the war years.

Perhaps the most significant changes throughout the industry which began after World War II were the advent of many more small companies into the paint business and the advance in technology on the part of all participants in the industry. The combination of these factors made it difficult for the older and especially the "quality" producers to maintain a rate of progress proportionate to the industry. In 1949 it was calculated that the 14 largest paint companies sold more than 65% of the total industry volume. In 1960, another estimate gives the 15 largest participants 58% of the total. In this period, of course, the total market expanded almost 80% but the rate of growth favored the smaller - and usually newer - members.

This factor became increasingly evident to Du Pont after the record year of 1955. For the next three years, Du Pont sales went into a decline while, for the first time, total sales volume for the paint industry enjoyed an opposite trend. Once again, the trend of Automotive Manufacturing sales more closely parallels that of Du Pont divisional paint sales than does any other industry segment.

In 1958, clouds appeared on the economic horizon and "retrenchment" programs were the order of the day. While serious impact on sales and profits resulted, the recession proved to be short-lived and in 1959 a strong recovery trend set in which lifted all business elements and spirits. The last three years have seen the Du Pont sales trend equal or exceed the physical growth of the industry. The same period, however, has been characterized by the "profit squeeze", and the earnings rate has been steadily reduced.

Du Pont Finishes faces a formidable challenge in the years ahead, probably greater than any of those surmounted in the past. The market opportunity is large and increasing but the industry is sophisticated and the suppliers are many and hungry. Shorter lead times with new products are a certainty. Higher cost penalties which are inherent to large firms in many areas of business conduct make it increasingly difficult to maintain prices competitive with less

responsible manufacturers. Raw material suppliers provide more and better technical information to all finishes manufacturers. Of continuing great significance is the fact that most manufacturers of finishes seemingly are content with profit margins well below Du Pont standards.

Du Pont business history is replete with challenges which have been met and overcome. Hopefully, Finishes will add to that bright record in the upcoming years.

Ref. = Charts A, B, C

DEPARTMENTAL MANAGEMENT

In August 1947, J. W. (Warren) Kinsman was elevated to a Vice Presidency of the Company and was succeeded as General Manager of F. & F. by E. S. Nickerson who had been Assistant General Manager for the previous two years. H. H. (Horace) Hopkins, then Finishes Division Manager, succeeded Nickerson as Assistant General Manager. Matt Denning was appointed to replace Hopkins and M. A. Dibble was named as his assistant. Dibble held this position until his untimely death in 1950.

In March, 1951, Hopkins transferred to the Treasurer's Department and D. H. (Dave) Dawson came to F. & F. as Assistant General Manager. Dawson, after a period in research work, had been successively Director of Sales and Assistant General Manager of the Pigments Department.

In February, 1952, Matt Denning retired due to failing health and was succeeded as Finishes Division Manager by J. W. (John) Nestor who had served for almost six years as Assistant Director of Sales and for one year as Assistant Manager of the Division. Of sad note is the fact that Denning died in 1955. His career in Du Pont Finishes had embraced 32 of the most exciting years.

In October, 1953, Dave Dawson transferred to Textile Fibers Department - en route to a Vice Presidency to come later - and the position of Assistant General Manager was filled by W. F. H. (Walter) Mattlage. For the previous five years Mattlage had managed F. & F.'s Fabrics Division, having come to this department from prior service with Remington Arms.

For the ensuing five years Nickerson and Mattlage would guide the destinies of the F. & F. Department. Both men had backgrounds of Fabrics experience rather than Finishes and the intimate problems of the paint industry were novel in some respects.

On December 31, 1958, E. S. Nickerson voluntarily retired after having directed F. & F. during a period of tremendous growth for more than 11 years. He was succeeded by Walter Mattlage and John Nestor became Assistant General Manager.

Coincident with these personnel changes, the Finishes Division and Fabrics Division were abolished as separate entities within the F. & F. Department. The position of Finishes Division Manager, created by J. W. Kinsman in 1944 and first occupied by E. M. Flaherty, no longer existed.

The extent of Du Pont Finishes progress during Nickerson's tenure of office can best be gauged from the sales and earnings statistics which are charted. New sales peaks were reached which would not be exceeded until 1960. Operative Earnings were accomplished in 1950 and 1955 which have not since been equalled.

The degree of accuracy in judging the contributions made by any individual to the course of history seems to be in direct proportion to the elapse of time after the subject leaves the scene. It is still soon to evaluate fully and correctly the role that Nickerson played in shaping the course of Du Pont's Finishes business. From this observer's point of view, this much can be said:

Nickerson was an able, dedicated executive. The guiding principles of his business life were improvement of Du Pont profits and enhancement of Du Pont stature in the business and public mind. He had unusually high standards of personal and business integrity. He was an excellent judge of character and a keen business analyst.

Subject to weaknesses as are all in low or high position, it seemed to many in the organization that Nickerson frequently engrossed himself with details beyond those which should be of prime interest to General Management and that his native conservatism at times resulted in Du Pont's attacking a problem with men or material resources on a "too little, too late" basis. Certainly some opportunities were sacrificed that in retrospect should have been handled differently. How many instances there were where his conservative approach saved money and effort which would otherwise have been wasted will not be known.

Again, the purpose here is not to attempt a judgment which is neither appropriate nor possible. Elgin Nickerson was a General Manager who directed an extremely complex business during a period of vast growth and did it on a highly profitable basis and in keeping with Du Pont's high standards. He selected most of the people now occupying key positions

throughout the department and exerted effort to help them gain stature in the organization. He was intellectually honest which is perhaps as great a business attribute as moral honesty is to personal character.

For the major part of the fifteen year span covered by this account, Nickerson was the dominant figure in Du Pont Finishes and thus had greater influence on all facets of business reported in this chronicle than any other individual.

PRODUCTION

In 1947, A. K. (Al) Burke held the position of Director of Finishes Production. His assistant was M. A. Dibble. In that year, however, Dibble was promoted to Assistant Finishes Division Manager and was succeeded by L. H. (Lyman) Priday.

Al Burke had occupied the Director's position since 1943. With long experience in the production of finishes at several Du Pont plants, Burke was a capable executive who developed a highly efficient production staff in the Wilmington Office and maintained close control of all Finishes production operations.

Many improvements characterized Burke's regime as Production Director. He established a Process and Methods group designed to provide chemical engineering skills for the benefit of all plant operations. He initiated the development of processes for the manufacture of better dispersions through the use of finer pigments than had formerly been used. He sponsored the development of better paint mixing techniques. These efforts resulted in production efficiencies which aided Finishes business through reduction of costs, improved products and better customer service. In the matter of service, Burke was particularly "sales-minded" and gave utmost co-operation to Sales in meeting as many customer demands as production resources could possibly provide. His retirement from service in 1950 marked the departure from active duty of another of the great pioneers of Du Pont finishes business.

Al Burke lived in comfortable retirement - with continuing interest in the activities of F. & F. - until his death in 1961.

In 1947, production was still hampered by shortages not only of some raw materials but also of labor in certain locations - particularly Toledo, Chicago and San Francisco. Rated plant capacities in that year totaled 2,631,000 gallons per month (pigmented products) and annual production of more than 24.5 million gallons testified to the rate of activity.

Production facilities were being steadily modernized and increased. A program was also underway to streamline plant clerical work which had become unwieldy in the course of rapid increase in volume of business. This effort got immediate results and at the end of 1948 the

division's plants operated with fewer clerks than at the end of 1946 despite a unit volume increase of some 22%.

In this period there came about one of the most significant advances in production techniques in the history of the paint business. This was Du Pont's development of the "47 Process", an improved method for pigment dispersion using fine sand as a grinding mechanism. This development is described in further detail in an Appendix covering important research developments.

Expansion of the original idea into a production reality was the work of many people in the plants and laboratories. J. S. Allen conducted basic formulation studies to encompass a large variety of products. D. G. Bosse developed basic data on fundamental pigment properties which enabled the scientific calculation of formulas instead of trial and error development. Equipment design work was handled by such men as T. S. Stevens, J. B. Aaron and R. P. Balmert, J. Nikolich and Bosse.

Development of the "47 Process" to the production stage took place during 1947 and 1948 with significant effect first apparent in 1949 operations. By that time some 12 production units had been installed and the flexibility and capacity of our grinding facilities had been importantly increased. Work in perfecting the process - with new equipment design - continued through 1954. Patents were obtained and licensing arrangements were extended to other paint manufacturers, from which royalty income would be substantial. By the end of 1961 it would amount to almost a million dollars in accumulated revenue from some 250 licensees.

Upon retirement in 1950, Burke was succeeded as Director of Production by Lyman Priday who had been Burke's assistant since 1947. Priday would serve in this position for some six years to come, a period which saw peaks of production activity. H. E. (Harold) Goldsmith became Assistant Director.

Priday was considered a competent production man who could and did carry a heavy work load with ability. His administration was characterized by special and effective attention toward simplification of plant operations - largely through acceleration of plans to install and use more efficient equipment. He designated a Materials Handling Engineer whose efforts resulted in

streamlining can filling operations and improving storage and handling of raw materials in all plants. He also created the first Plants Chemical organization, the function of which was to improve quality control and develop more effective liaison between development laboratories and plant laboratories.

Study convinced Priday that improvements in production control could be made through new techniques in data handling and a study termed "Operations Research" was instituted. After some two years of preliminary study by L. B. (Larry) Soper and others, the firm of Arthur D. Little & Co. was engaged in 1955 to conduct an investigation and recommend procedures for improvement of production control and order handling. This was carried out in the ensuing year.

The results of this program first became effective in 1956 when the initial application to Refinish production scheduling was made. They became increasingly evident in succeeding years as the techniques were refined and extended throughout the Division's operations. By 1961, electronic computing equipment would be in use in all areas of production scheduling and finished product stock control and the benefits would mount with the increasing volume and complexity of our business.

In 1951 a broad study of production facilities needed for the long range future was initiated. Completed in 1952, this indicated the need - based on sales forecasts - for capacity to handle 25% greater volume in 1960 than had been produced in 1950, the base year for study. (From the lofty heights of retrospect, this proved erroneous as pigmented production in 1960 was actually 10% less than in 1950.)

A facility study was completed in 1954 which considered several alternate methods for obtaining the additional capacity forecasted. These included additions at existing plants for manufacturing and warehousing; additions for manufacturing only with more leased warehouses in the field; the maintenance of present plants for large scale, general purpose manufacturing supplemented by the erection of several small, low cost plants with production confined to a limited variety of fast-moving products. The latter alternative, with the initial new plant to be located in the vicinity of Atlanta, Georgia, was chosen as the most advantageous.

In the matter of securing approval for the construction of this plant, it may be mentioned that the people most instrumental in furthering the project were Priday, C. P. (Charley) Culp who was at the time Atlanta Regional Sales Manager and vigorously presented the sales benefits which would accrue to southern business, and Walter Dannenbaum, a Vice President of the Company and member of the Executive Committee. Mr. Dannebaum thought it would be to the Company's interests to see just how economically paint could be produced in a strictly modern plant geared to rapid production of a few products.

An appropriation of $2.6 million was authorized in July, 1955. Final project cost was $2.1 million, a welcome under-run. Construction was completed in October 1956 and full operation began in June 1957. Twenty-one day/month capacity was rated at 225,000 gallons.

The Tucker plant was somewhat of a pioneering experiment. The premise was that this type of low investment, low operating cost facility could be erected at various outlying locations to produce in a streamlined manner the easier-to-make products for the surrounding area, leaving the existing plants free to take care of the requirements of their normal service areas as well as furnishing intermediates and all products not produced at the outlying locations. Emphasis was placed on providing facilities and materials handling equipment embodying advanced ideas to create an ideal yet simple plant. If successful, Tucker would serve as a prototype around which long range expansion plans would be based.

While the need has not yet been developed, should future expansion be required, the Tucker plant may yet fulfill that element of its concept.

Upon Lyman Priday's retirement, F. H. (Frank) Beadles became Director of Finishes Production on January 1, 1957 with E. E. (Ed) Furst as assistant. With a background of sales as well as production experience, Beadles carried to this job a fine knowledge of the needs as well as the mechanics of the business.

Under Beadles' direction, a number of significant additions to Finishes Division's productive capacity have been made.

As will be noted elsewhere, "Lucite" automotive finishes replaced "Duco" in the period from 1955 to 1959. This created many manufacturing problems and involved the installation

of about one and one-third million dollars worth of new equipment at the Flint and Parlin plants. To accomplish this while maintaining high production rates was an achievement of no small proportion.

Somewhat apart from paint, but also a responsibility of the Production Division, was the transfer of the Columbia synthetic sponge plant from the Film Department to F. & F. which was done in 1959. A brief history of the sponge business would perhaps be of interest at this point.

Synthetic sponges were invented by French scientists in the early 1930's and were first produced on a commercial scale in this country in 1936 by the Cellophane Division of Du Pont at Buffalo, New York. By 1940, annual production had reached 50,000,000 cubic inches (50 MMCI) - equal to 25 large trailer loads.

A boost in production came during World War II when sponges met a need in numerous military applications. Also, during that time many service personnel were introduced to the cellulose sponge for the first time.

Production rose to 210 MMCI by 1945 and by 1950 had increased to 565 MMCI. The major advance during this period came from the development of new uses for sponge products. The fastest growing application was in mops. One kind of sponge mop is made of strands of sponge yarn which consist of ordinary cotton yarn coated with a special quality sponge material.

With the growth of quality sponge products, additional facilities to meet this demand became necessary. Possible plant locations were reviewed and a site in Columbia, Tennessee was found which included an existing factory building, powerhouse, and other facilities. It had been built in 1944 for the National Carbon Company to manufacture activated charcoal for gas masks and was never used.

After the war, the R.F.C. sold it to a farmer's cooperative for seed storage but the co-operative found the building large for its purpose. The plant was offered for sale and purchased by Du Pont in 1951. Due to government restrictions and controls on construction brought about by the Korean War, plant Finishing Area operations did not begin until June, 1952, using sponge blocks produced at Buffalo. Installation of facilities was completed and manufacture of sponge blocks at Columbia began in December, 1952.

The Columbia Plant was soon able to handle the total production requirements of regular cellulose sponge material, and, in 1953, sponge production at Buffalo was suspended except for sponge yarn. Through modernization and expansion, the rated annual capacity has grown from 627 MMCI in 1952 to 1400 MMCI in 1961.

In 1960, the production of sponge cloth, developed at Buffalo, was started at Columbia with a rated annual capacity of 6,100,000 square feet (6100 M sq. ft.). This product is manufactured similar to sponge yarn and consists of cotton netting (scrim) coated with a special quality sponge material.

Production volume reached its highest level at 1,055 MMCI for sponges in 1960 and 1,885 M sq. ft. of sponge cloth in 1961.

Another important addition to Finishes production facilities was represented by the "Budium" installation at Fort Madison which took place in 1960-61. Du Pont had been a major supplier of coatings for the interior of cans for about 30 years, the products consisting primarily of an oleoresinous enamel used on food cans, and epon and oleoresinous enamels used for base coats on beer cans. Competition was becoming more intense and the price structure was weakening as more producers entered the market with orthodox and new type products.

The F. & F. Department developed "Budium" polybutadiene interior can coating as a replacement for conventional products. It was produced in semi-works in limited quantities starting in 1954. After a prolonged testing period, customer response and trade acceptance was good, this product possessing quality and price advantages over competitive offerings.

Part I appropriation request in the amount of $115,000 was authorized in July, 1959, for partial design and preparation of a construction cost. Part II request for construction of commercial facilities at the Fort Madison Plant was authorized in March, 1960, in the amount of $1,855,000, increasing the appropriation to $1,970,000.

Polymerization capacity is 4,125,000 gallons yearly for producing two products, one for food cans and beer can base coats and the other for beer can top coats. However, finished product storage capacity was limited during the early commercial phase to 50% of polymerization capacity. Initial production commenced in April, 1961, and commercial production in June, 1961. During all of 1961, a total of 225,000 gallons of this product were produced.

Other new facilities provided under Frank Beadles' administration have been for the manufacture of polyester adhesives at Parlin; for the manufacture of "Lecton" at Chicago; semi-works manufacture of ML wire enamel at Philadelphia and semi-works manufacture of V-54 vehicle at Parlin.

Along with the production of these entirely new products has been (in 1961) the gearing up to produce a tremendous output (some 2,800,000 gallons) of Trade Sales "Lucite" Wall Paint, a modification of an existing emulsion finish. That this task was accomplished with minimum service problems has been a tribute to the efficiency of the Finishes Production organization.

All of the accomplishments referred to above, in addition to meeting normal service requirements for an enterprise of this magnitude, have placed great premium on the ability of local plant management. It is not possible to detail the contributions of each individual involved but recognition should be made of the people who occupied these key positions in Du Pont's paint business during the period here under review. Managers of the respective plants with tenure of office as indicated are therefore shown as follows:

PLANT	MANAGER	TENURE
Toledo	E. E. Furst	11/45 – 1/54
	R. J. Knake	1/54 – 9/55
	F. E. Walter	9/55 – 11/56
	H. L. Priddy	11/56 –
Tucker	K. E. Ackley	3/56 –
Philadelphia	D. G. Kennedy	12/44 – 1/54
	N. I. Dress	1/54 –
Parlin	L. H. Priday	2/47 – 9/47
	H. L. Priddy	9/47 – 10/56
	R. H. Bell	11/56 – 7/58
	F. E. Walter	7/58 – 7/60
	R. H. Bell	7/60 –
Ft. Madison	E. J. Mac Farlan	10/47 – 12/48
	H. F. Bodin	12/48 – 4/51
	N. I. Dress	4/51 – 1/54
	F. E. Walter	1/54 – 9/55
	R. J. Knake	9/55 –

PLANT	MANAGER	TENURE
Flint	H. E. Monk	11/45 – 9/50
	H. E. Johnson	10/50 – 10/57
	H. R. Stine	10/57 –
Everett	C. D. Neff	10/45 – 8/47
	H. F. Bodin	9/47 – 10/48
	P. J. Griffin	11/48 – 8/54
	K. E. Ackley	9/54 – 2/56
	R. E. Durfee	3/56 –
Columbia	C. A. Perry	12/52 – 5/61
	C. C. Quenelle	5/61 –
Chicago	C. W. Clark	9/41 – 3/51
	H. R. Ayers	3/51 – 12/60
	C. C. Quenelle	1/61 – 5/61
	R. A. DeWall	5/61 –
So. San Francisco	P. J. Griffin	1/42 – 12/48
	E. J. Mac Farlan	12/48 – 9/54
	M. L. Byron	9/54 –

Finishes Production, under the competent direction of Frank Beadles and Ed Furst, is geared to fully meet the requirements of the business as presently foreseen. If and when the needs enlarge, this organization has demonstrated its ability to adapt skillfully in meeting new conditions. The record of the past 15 years reflects much credit on this section of the Finishes organization.

Ref. = Chart C

SALES MANAGEMENT

In 1947, H. R. (Harold) Lounsbury occupied the position of Finishes Director of Sales and John Nestor was Assistant to him. This alignment had been in effect since mid-1945. Sales offices, each under the direction of a Regional Sales Manager, were in operation at Atlanta (W. T. Banning), Boston (S. B. Woodbridge), Chicago (G. A. Biesecker), Cleveland (J. L. Masterson), Philadelphia (J. H. Stutt), Dallas (G. F. Baldwin) and San Francisco (J. T. Edgerly). Automotive Manufacturing sales were nationally directed from Detroit by R. C. Williams; Chemical Specialties and Export Sales from Wilmington by G. W. Sherin and Ralph Plowman respectively. Industry Staff positions at Wilmington were occupied by S. L. McSorley (Trade Sales), R. R. Allen (Refinish), H. E. Lackey (Industrial) and S. L. Johnston (Adv. and Promotion).

Changes in personnel assignments occurred periodically over the succeeding years. During 1947, Guy Biesecker at Chicago retired after 41 years of Du Pont service and D. E. (Dave) Goldich replaced him as Regional Sales Manager. In 1948, Sumner Woodbridge reached retirement age, also after 41 years with Du Pont, and was succeeded as Boston Regional Sales Manager by H. E. (Harold) Goldsmith. After two years in this spot, Goldsmith was promoted to a Production post in Wilmington and W. E. (Bill) Kreuer took over the Boston managership.

In 1949, Henry Lackey, one of the true pioneers in Du Pont paint history, retired and his position was taken by J. B. (Joe) Dietz. In 1951 John Nestor was elevated to the post of Asst. Finishes Division Manager and Joe Dietz succeeded to the Asst. Director of Sales post. W. E. (Bill) Fisher became Manager of Industrial Sales, Wilmington staff.

1952 saw further changes. At the Atlanta Regional office W. T. Banning retired and C. E. (Charley) Culp was appointed to the Atlanta sales position. The responsibilities of the office of Asst. Director of Sales were divided and F. H. (Frank) Beadles was named an additional Asst. Director of Sales in charge of Auto Manufacturer Sales, Interdepartmental transfers and Sales Technical activities. A new Regional Sales office was established at Kansas City with J. L. (Leo) Masterson in charge, the Cleveland vacancy thus created being filled by the appointment of R. L. (Dick) Sanger to that position.

It was not until 1955 that further personnel changes in key sales positions were made. At that time Harold Lounsbury suffered an illness which indicated that he must forego further work in an area of heavy, continual responsibility. The office of Sales Services was established with certain personnel and control responsibilities for the expanding field organization and its properties and Lounsbury was named manager of that section. J. B. Dietz moved to the Director of Sales position and was succeeded as an assistant director by W. E. Kreuer. D. E. Goldich moved from Chicago to the Boston Regional Manager's post and the Chicago position was filled by the return of H. E. Goldsmith from Production to Sales.

Later that year other changes took place. Jack Edgerly was transferred from San Francisco to Wilmington and Leo Masterson replaced him on the West Coast. G. H. (George) Berlin followed Masterson as Regional Sales Manager at Kansas City. S. L. McSorley met untimely death and was succeeded as Trade Sales Manager, Wilmington Staff, by D. V. (Don) Bauder. S. L. (Stewart) Johnston retired and the position of Manager, Adv. and Promotion, was filled by L. M. Davis.

The first of 1957 saw a complete revision of the Finishes Sales organization. Since 1932, field sales effort insofar as Trade Sales, Industrial and Refinish industries were concerned, had been largely decentralized with line responsibility vested in the Regional Sales Managers. The latter positions were now abolished (with the exception of the West Coast) and the line organization in those industry segments henceforth would be directed from the Wilmington office.

The reason for this change has been expressed by Joe Dietz as a desire to unify line and staff functions in order that there would be common authority for the formulation and field execution of all policies pertaining to these segments of the business.

In carrying out the personnel reassignments involved in this major change of organization, the Regional Sales Managers were transferred to Wilmington and given new positions with line and staff authority. In each industry there were created "East" and "West" Zone Managers, thus representing some compromise with the former principle of Regional managership. The individual assignments resulting will be discussed in the respective industry portions of this account.

Since the West Coast Regional Sales Office was not included in the general reorganization, it may be noted here that that office continued to function as before until 1960. At that time Leo Masterson retired after 34 years of Du Pont Finishes' service and henceforth the West Coast area would be handled in the same manner as other districts. In his colorful career, Masterson made many contributions to the development of Du Pont's paint business and will be remembered as one of the earlier pioneers who helped build the framework for later-day vast development.

Coincident with the reorganization, Dave Goldich retired at the close of 1956. Comment on his role in aiding the growth of this great business will be made in the Refinish section of this account.

In 1957, Frank Beadles was promoted to Director of Finishes Production and was replaced as an Asst. Director of Sales by R. B. (Roy) Davis, with some realignment of responsibilities between the two assistants. The first of 1960, W. E. Kreuer was transferred from Finishes to F. & F.'s Fabrics Division and W. D. (Bill) Lawson was moved from the Research Division to fill that Assistant Director of Finishes Sales vacancy.

In view of his impending retirement at the time this is written, a brief tribute may here be paid to Harold Lounsbury who directed Finishes Sales throughout most of the period covered by this account. In this writer's opinion, Lounsbury's finest attribute has been his ability to select good, qualified men for job assignments. A study of the business career of many individuals now occupying key positions in the Finishes organization will reveal their having been selected by Harold Lounsbury for advancement at some critical point in their career. Instances of misjudgment are rare. This is indeed a testimonial to business acumen in an area which perhaps has greater importance than any other business factor.

Lounsbury was one of a large group of "Parlin plant graduates" who moved through the years to positions of responsibility in Du Pont Finishes activity.

AUTO MANUFACTURERS SALES

Sales to automotive manufacturers in 1947 were being directed from the Detroit Office by R. C. (Red) Williams. Williams had pioneered the introduction of "Duco" to this industry in 1923 and had lived very closely with the business since that time, acting first as a technical serviceman, then as salesman and, from 1928, as Asst. Manager of Automotive Sales. In mid-1943, upon the retirement of G. A. Staples, Williams had moved to the Automotive Sales Managers' position.

Much of the success enjoyed by Du Pont in selling its finishes to the automotive trade must be attributed to "Red" Williams. A strong personality, good basic technical knowledge and an intense competitive spirit carried Williams – and Du Pont – to remarkable heights in this highly exacting and fiercely competitive field. Through close and constant personal contact with all finishing operations and the individuals concerned therewith, Williams developed thorough knowledge of not only current requirements but the future desires of the industry. Directing his own sales and service groups and the technicians of the Flint Laboratory as a team, Williams saw to it that Du Pont stayed in the forefront of technical development. In sales work he established and maintained excellent customer relations. With enthusiastic participation in social as well as business activities engaged in by automotive executives, Williams came to occupy a respected position throughout influential circles in the motor capital and Du Pont's business was the beneficiary.

In 1947, sales to this industry reached an all-time high of almost $20 million, exceeding the previous high volume year (1941) by more than 80%. While higher prices were responsible for a goodly portion of the increased volume, this still represented more than 50% greater unit volume. While the industry as a whole enjoyed greater activity than ever before, Du Pont's competitive position also improved substantially. Not only did General Motors produce uninterruptedly in record volume in 1947 but some 17% of Du Pont finishes sales were made to other manufacturers, particularly Ford, Nash, Studebaker and Kaiser-Fraser.

This was a year of practically full return to a civilian economy after the long, lean war period and Du Pont was in position to take good advantage of it in the great automotive industry.

The ensuing years through 1950 saw continuing auto production and Du Pont finishes increases, with Du Pont sales volume in 1950 reaching a level of $35 million. This was accomplished without benefit of price advances. During 1949 and 1950, prices to this industry actually declined fractionally, due in some measure to intensified competition on the part of other suppliers who were attacking this lucrative market with utmost vigor.

Laboratory work on "Lucite" acrylic automotive lacquer was started at the Parlin Research Laboratory in 1948. It was the outgrowth of a research project whose objective was the development of an automotive finish having the low cost features of "Dulux" Enamel, the styling and fast dry features of "Duco" lacquer, with durability superior to either. Methyl methacrylate polymers stood out early as the best candidates. Bad webbing at low solids and lack of adhesion were two of the major obstacles that had to be overcome.

A laboratory task force of 10 to 12 men under J. H. Lowell, as supervisor, carried out the laboratory development.

Field tests on Georgia Power cars were started in 1953. Important defects were uncovered and corrected. Detailed information on the technical development of "Lucite" lacquer is contained in the section on Research.

In 1954 an improved "Dulux" enamel was developed, known as "Dulux" 100. This marked a significant effort to gain business from those manufacturers who preferred the use of enamel to lacquer in their finishing processes, notably Ford and Chrysler. The new product was of great interest to Ford, particularly, and enabled us to get some increase in business from that firm at once.

1955 marked the year of greatest automotive outpouring with the industry making 7,900,000 passenger cars and 1,300,000 trucks, production figures which have not since been equalled. Du Pont fully maintained its share of this total volume and Auto Manufacturer sales reached $51,000,000, a figure larger than the sales volume of the entire Finishes Division as recently as 1939.

In 1955 some 15,000 cars were finished in "Lucite", representing a few colors in a "special lacquer" on 1956 models of Chevrolet, Oldsmobile and Pontiac. In the year following,

235,000 "Lucite" finished cars were produced and that year (1957) this new product contributed some 20% of total topcoat sales to the industry. It was adopted by General Motors on all models as "Magic Mirror" finish beginning with the 1959 year model and used to a small extent by Ford for the Lincoln-Continental.

Announcement of the new finish by Du Pont had first been made to the trade through the pages of "Fortune" and "U.S. News and World Report" in March of 1956. Large 4-color advertisements in "Life" and "Saturday Evening Post" acquainted the public with the product in the Fall of 1957.

In its accepted form, "Lucite" required special undercoats for crack resistance, a sealer for adherence, and special reducing solvents. It required rubbing and polishing like that required for "Duco" nitrocellulose lacquer. The stylists were early attracted by the wide variety of bright metallic colors available in "Lucite" which were not available in "Duco". This aesthetic value, along with the favorable reaction from dealers, were large factors in the acceptance of "Lucite" by the industry.

In 1958, R. C. Williams retired and the position of Automotive Manufacturing Sales Manager was filled by H. E. (Haywood) Johnson. Johnson had been closely associated with automotive finishes business from production experience in the Flint plant, having been Manager of that facility for seven years preceding. Because of the unusually close relationship between sales and manufacturing which prevailed at Detroit and Flint in serving this industry, that experience was of great value in taking over the sales responsibility.

In the early years of the period covered by this report, E. L. (Ed) Theuer served as Asst. Manager of Automotive Sales. Theuer died in October, 1955 and was succeeded in his position by G. R. (Ray) Maher, who continues in that capacity today. In 1961 an additional Asst. Sales Manager's position was created in this organization with J. P. (Jack) McAndrews being assigned to that post.

The Automotive Manufacturing sales force at the close of 1961 consisted of 14 salesmen.

In taking a summary look at Du Pont's position in the automotive finishes field, several conclusions may be drawn. The close relationship between Du Pont and General Motors provided

a favorable background for the solicitation of business. The development and maintenance of the very substantial volume which was secured and firmly held depended, however, upon many things. Most important was product satisfaction – which included not only suitable quality but the adaptability of materials for use under prevailing – and frequently changing – conditions. Delivery service – meeting exacting production requirements at many widely separated plants with a wide variety (ever increasing color range) of materials – has been a vital element. Customer service in the way of technical assistance, styling initiative and the prompt investigation of user complaints in the field have had important influence. Customer relations have been maintained on a healthy plane with particular emphasis on respecting organizational channels of authority and knowing appropriate times and people through whom to handle difficult situations.

By having capable people in key positions in sales, production and technical groups, and by enlisting the efforts of these people to work as a team close to the scene of action, Du Pont's automotive finishes business has been a bright example of commercial achievement. The result has extended well beyond the volume and earnings credited directly to "Automotive Manufacturing" inasmuch as success at Detroit has probably been the greatest single factor in gaining and supporting business in the after-market – the Refinish trade.

To the builders of this great and profitable business structure – at the plants and laboratories and at the Detroit sales office – should go lasting commendation.

Not to be foregone is the opportunity to observe that the principle on which this business has been developed – closely integrated effort between the sales, production and technical people involved – has proven to be productive of splendid results. While attempts are made to establish a community of interest in our approach to other large markets, nowhere has this been accomplished to the degree that has been true in Detroit and Flint. The military establishment long ago determined that the task force – with all elements dedicated to a specific mission – got best results in handling a difficult assignment. Quite likely there are many business parallels. The handling of the automotive paint business happens to be Du Pont Finishes finest example.

Ref. = Chart D

INDUSTRIAL SALES

In 1947, Industrial Sales policies were being formulated in Wilmington by H. E. (Henry) Lackey who had occupied the Industrial Sales Manager's staff position since 1932. Field sales effort at the Regional level was in the hands of a group of experienced men – J. W. (Whitey) Cleaveland in Atlanta, G. K. (Ken) Stout in Boston, W. P. (Bill) Fisher in Chicago, W. E. (Bill) Kreuer in Cleveland, R. M. (Bob) Dean in Philadelphia and G. A. (George) McDonald in San Francisco. All of these men had pioneered Du Pont's entry and subsequent growth in industrial finishes.

Industrial Sales represented by far the largest segment of Finishes business, totaling $32,600,000 sales volume as against about $25 million for the next largest industry – Trade Sales. Industrial would hold this leading position for another seven years until 1954, when both Automotive and Trade exceeded Industrial in volume for the first time.

In the early post-war years Industrial, along with all other segments of Finishes, had its supply problems. By 1947 this was rapidly being relieved but the situation still did not permit expansion into new business areas. Meanwhile, new, small paint companies, who had acquired the know-how on synthetic formulations by supplying government specification paints during the war, were increasingly active in the industrial field. More research effort was being devoted to this business by all participants. Competition adopted the use of field service men, an area of sales support formerly limited to a very few large firms. As material supplies increased, price competition became more severe than ever before.

Du Pont at that time enjoyed a commanding position in the home appliance field with "Dulux" enamels. With a pent-up demand for their products, appliance manufacturers maintained high production rates and Du Pont benefited proportionately. This business represented the backbone of Industrial sales. The alkyd resin primers and topcoats pioneered by Du Pont in the 30's had been replaced about 1939 with alkyd-urea formaldehyde types giving shorter baking time, better hardness and color retention. In 1946 - '47 the alkyd-melamine type was introduced, offering still further improvements in various properties.

The field of wire insulation was, at this time, in a stage of rapid development and Du Pont made a significant penetration with Formvar (polyvinyl formal resin) and nylon enamels. By 1947 sales had reached $1,500,000 of profitable business and further gains were ahead. In 1954 it was decided to devote specialized sales attention to wire enamels and F. J. (Fred) Emig, a capable industrial salesman, was appointed manager of Insulation sales.

In another field of somewhat specialized interest Du Pont also was gaining a foothold. This was the general area of industrial adhesives. Ancestored by Household Cement, a specialty item of fine quality, Du Pont had engaged in developing and marketing nitrocellulose based adhesives for some years past. New raw materials including synthetic rubbers, phenolics, vinyls, alkyds and epoxies were being introduced and the sales volume of industrial adhesives reached almost 1.5 million dollars in 1948.

An offspring development which also occurred at this time was the result of a letter to the President of Du Pont from a publishing company in Chicago. This letter – from Mr. Adam Moses, Vice President of the W. E. Hall Company – expressed the need for a fast setting, flexible adhesive suitable for high speed binding of paper covered books and magazines. Investigation of this inquiry led to research that subsequently resulted in the development of a line of hot melt bookbinding adhesives and a business which has now grown (1961) to a volume in excess of one million dollars a year.

The new interest in the whole field of adhesives prompted the holding of an "Adhesives School" in 1947, conducted by H. R. (Harry) Young, for the benefit of field service men. From that time on, Harry Young has directed the development and sales effort of Industrial's adhesives business and deserves principal credit for the substantial progress which has been made. Future prospects in this field portend further gains of considerable importance.

In 1947 occurred an incident which had some effect on Divisional policies. A maker of radio cabinets – Universal Molded Products Corporation – instituted suit against Du Pont claiming $650,000 in damages for failure of the finish on their product. The trial court found for the plaintiff and awarded a judgment in the amount of $562,000. This was later set aside by the Supreme Court of Virginia but the matter of liability had been forcibly brought home to Du Pont

and measures were taken throughout the Finishes Division to protect as much as possible against damage suits and to lessen our liability should they occur. Field salesmen reported that the considerable emphasis placed on disclaiming responsibility in the event of finish failures resulted in creating a sales handicap of serious proportions.

By the end of 1948, raw material supplies were more nearly in balance with demand than at any time since pre-war and paint prices reflected the more competitive situation. Industrial finishes prices held reasonably firm and, without the threat of price advances, buying slackened in 1949 and sales declined for the first time in several years. In 1950, however, volume – for Du Pont and the industry – increased sharply due to the Korean war and its threat of another world conflict. Once again we experienced product difficulties. Soya bean oil, which was substituted for castor oil in our furniture lacquer formulations, caused failures in the system and our position in this large market suffered another blow.

This period marked a development of note when "Teflon" sprayable coatings were first introduced. Offered originally in 1947-'48 as superior coatings with good corrosion resistance and "non-sticking" characteristics, these products for many years had limited appeal. Recent stimulation (1961) however, and good future prospects for the business make that introductory effort worthy of note in a chronicle of Industrial Finishes history.

Because of the direct concern with Industrial Finishes, mention should also be made of another legal matter which was of considerable concern to Du Pont in the 1948-'51 era. In 1948 a criminal suit was brought by the U. S. Government against Du Pont and other paint manufacturers for fixing the prices of paints, varnishes, enamels and lacquers in violation of the Sherman Act. A companion suit involving Du Pont and other defendants for fixing the prices of wood finishes was brought simultaneously. In both cases, each of the defendants except Du Pont and Glidden entered pleas of nolo contendre and fines were imposed on such defendants. The first suit was tried before a jury in Pittsburgh, Pa. in 1951. The jury found that Du Pont was not guilty of price fixing on the basis of evidence that Du Pont representatives had not participated in the meetings at which the price agreements had allegedly been made. Following the jury verdict, the Government dismissed the second suit involving price fixing of wood finishes.

Any account of the development of Du Pont's Industrial paint business should make note of the part played by the Field Service Laboratories. The principle of operating a small laboratory devoted entirely to helping solve customers' problems, conveniently located adjacent to customer areas, had been first implemented in 1939 with the establishment of such a facility at Roanoke, Virginia to service the furniture industry in that vicinity. The idea proved successful and subsequently other such installations were launched until today (1961) there are seven Field Service Laboratories operated by Industrial Sales across the country. The work handled in these places, while not of the technical depth reached at the division's Sales Development laboratories, provides flexibility and speed in answering relatively simple – but often highly important – customer problems.

One product area which came to the fore in the early '50's – and which was to prove costly to Du Pont for laggard participation – involved epon resins. Initiated as a cooperative development by Devoe and Shell Chemical, epon metal primers were introduced in 1950 and by 1952 were well established in both primer and topcoat products. This development represented the first serious threat to Du Pont's leading position in the Hi-Bake White field throughout the appliance industry. In 1952 this competitive pressure caused us to offer an epoxy type of primer which was a suitable product but the late timing resulted in a loss of prestige and position in the industry.

Our effort to offer improved products for appliances – to offset competitive inroads – resulted in improvements in alkyd-melamine topcoats which were brought out in 1954-'55. Our industry position was protected to a certain extent but Du Pont's role as the leader in supplying the appliance trade had been seriously challenged.

The epon resins also caused Du Pont much concern in another field where we had been in the forefront of development. Interior coatings for food and beverage cans represented a large and growing business in which we occupied a prominent position. Epoxy resin products were introduced to this market by competitors in 1951 and since that time have gained the lion's share of this market. We are now aggressively fighting our way back with a new product which will be mentioned later.

A novel development of the early '50's, which created considerable interest for several years, was the granting to Du Pont of a patent covering the application of finishing materials by steam spray. This innovation seemed to hold much promise and licenses were granted to some 40 industrial users. However, more economical methods of paint application, particularly electrostatic spray systems, gradually replaced steam spray and the process has almost been abandoned. The development did, however, regain for Du Pont some prestige as an innovator and secured an entre to a number of important customers.

During 1957, as will also be mentioned in discussing Trade Sales, Industrial transferred a total annual sales volume of $3,800,000 to Trade Sales responsibility. This constituted business of maintenance painting character in the petroleum, steel fabricator and commercial marine industries. Products used and painting practices followed in these industries more closely paralleled the Trade Sales field than the "paint-on-products" business of Industrial Sales.

At this time (1957) occurred the general change in organization which has been referred to elsewhere. It would therefore be appropriate at this point to review briefly the personnel of Industrial Sales for the preceding years. As has been mentioned, Henry Lackey occupied the Wilmington staff position of Industrial Sales Manager from 1932 until his retirement in 1949. Prior to and during this span of years, Lackey contributed vastly to the development of Du Pont's Industrial business. He had excellent practical knowledge of all facets of industrial finishing business and exercised calm, good judgment in handling the many problems. Deliberate in thought and speech, even tempered in relationships with his associates and customers, of deepest integrity in all personal and business dealings, Henry Lackey typified the "old school" Du Pont executive who played such a magnificent part in the Company's development and contributed so much to the Company's stature in the business world.

After eight years of quiet retirement, following 43 years of highly efficient service, Henry Lackey died in 1958. He was one of the giants in the history of Du Pont's paint business.

On December 1, 1949 J. B. (Joe) Dietz succeeded to the Industrial Sales Manager's position, having served as assistant for the four previous years. He brought to the Wilmington staff organization field sales experience which supplied a vital need. After a period of only slightly

more than one year, Dietz was made an Assistant Sales Director and relinquished the Industrial post to W. P. (Bill) Fisher on March 1, 1951. Fisher, who had previously served as Regional Industrial Sales Manager in both Boston and Chicago, likewise carried to this staff position the benefits of field sales experience and an intimate knowledge of Industrial finishes, a background of value in formulating industrial sales policies.

Upon the consolidation of line and staff responsibilities in the reorganization effective January 1, 1957, H. E. (Harold) Goldsmith was appointed Industrial Sales Manager. Goldsmith's background included Automotive sales work in Detroit, and terms of service as Assistant Director of Finishes Production in Wilmington and as Regional Sales Manager in Boston and Chicago. This variety of experience, which included everything from making the product to providing personal field service assistance to large users of paint, gave Goldsmith a unique background for directing one of the most complex and important segments of Finishes business. A sharp critic where criticism was needed, a good technical knowledge of products and a fine evaluator of sales accomplishments, Goldsmith directed the Industrial business courageously in the face of many handicaps for five years until his retirement at the close of 1961.

Picking up the Industrial product story for the last five years, we may turn again to the appliance field. This remains the largest single industrial finishes market for Du Pont. Acrylic resin products were introduced to this industry in 1958 by Du Pont and others and made immediate headway. Unfortunately a leading competitor – Pittsburgh Plate Glass Company – developed an acrylic product which has been accepted by the industry as superior in both quality and application characteristics. While alkyd-nitrogen type materials are still important factors, and we continue to hold good volume in the refrigerator field, our position in the whole appliance area has been weakened considerably. Hopefully, products to come from our research effort will regain lost ground.

In the can coating field, also very important to Industrial Finishes, work which was started on polybutadiene in 1952 progressed satisfactorily and resulted in the development of "Budium" products which are highly regarded by the trade. Semiworks production was started in 1954 and after a prolonged testing period a production plant was authorized in 1960 which began

commercial production in mid-1961. Current forecasts envision the sale of more than one million gallons annually which, if accomplished, will go far toward regaining for Du Pont a position of leadership in this growth industry.

In other fields, product advancements are also taking place. New types of wire enamels were first marketed in 1960 and the initial good reception indicates good growth opportunity. As noted elsewhere, "Teflon" sprayable coatings are showing phenomenal increases and may grow into multi-million dollar annual volume. New adhesives – some for particular use with new Du Pont films such as "Mylar", "Tedlar" and "H" Film – offer much promise and are potential contributors of important volume and profits.

At the close of 1961, Industrial Sales in the field were handled by 61 salesmen operating under six Regional Industrial Sales Managers, and four Assistant Regional Sales Managers.

In viewing Du Pont's Industrial Finishes' activity over the past 15 years, it seems apparent that the health of this business is more highly dependent on technological progress than any other one factor. Our leading position initially was gained through the development of "Duco" and "Dulux" products. As competitive technology sharpened in the post-war era, the margin of product quality narrowed greatly, with sales and profits reflecting our loss of a dominant position. Du Pont prestige suffered body blows when competitors first introduced such successful new materials as epoxies and polybutadienes. Our acrylic products have not measured up to all expectations and at the present time we are not in good position in one of the most attractive growth fields for industrial finishes use – strip coating of metals.

Throughout the 15 year period covered by this account, Industrial has contributed more dollar volume to F. & F. Finishes than any other industry segment. Because of the requirements of the business and the character of the customers involved, it is an area in which Du Pont should be particularly effective. To insure this for the future, however, is probably going to take an unusually high degree of skill in anticipating market needs by sales people and the development of unique products to meet those needs by the technical organization – to be accomplished in ever-shortening lead time. Hopefully, the stature of Du Pont in the expanding Industrial Finishes

area will be enhanced to a greater degree over the coming years than has been true in the last decade.

Ref. = Chart E

TRADE SALES

In 1947, Finishes Trade Sales in the field were being directed by M. J. (Skip) Hanger in Atlanta, L. D. (Jimmy) Horsman in Boston, H. R. (Harold) Marsh in Chicago, J. K. (Doc) Spare in Cleveland, J. C. (Jack) Holloway in Philadelphia, H. R. (Harry) Wells in Dallas and M. E. (Max) Heitsman in San Francisco. Fifteen years hence, Marsh would be the only one still active in Du Pont's paint business.

In 1947, Trade Sales was still operating under limitations of war-caused shortages of raw materials. White pigments and phthalic anhydride were in relatively short supply and automotive finishes needs were given first priority. As a consequence, many competitive manufacturers whose primary interest was the Trade Sales market, were in a better supply position than our own Trade Sales department. This had been the case, in greater or less degree, for five years past. One discouraging result of this situation, in addition to lost orders, was that many hitherto loyal Du Pont dealers found it necessary to add competitive brands to their inventories in order to stay in business. Unfortunately, many of these customers continued indefinitely the connections thus established – some out of appreciation for supply during a difficult period and others because of experiencing a good reception to the new, and usually lower priced, merchandise.

Paint prices in 1947 were moving up quite substantially. Du Pont was in the forefront of announcing price increases in most industries and in the Trade Sales area the increases were most pronounced. For example, a calculation made at that time interpreted 1947 vs 1946 prices of Du Pont paints in the following manner:

Industry Segment	1947 Actual Volume (Gross)	1947 Actual Adjusted to 1946 Prices	% Change
Trade Sales	$ 25,269 M	$ 18,814 M	+34%
Industrial	32,999 M	27,468 M	+20%
Refinish	15,901 M	13,972 M	+15%
Auto Mfg.	19,797 M	16,560 M	+20%
Export	6,713 M	5,679 M	+18%
Chem. Spec.	4,820 M	4,820 M	0
Transfers	6,133 M	5,500 M	+11%
Total	$111,633 M	$ 92,794 M	+20%

At this time, Du Pont began to supply some Trade Sales goods to many new accounts (1500 in 1947) which had been signed up on a "future franchise" basis during the war years. This aggrevated old customers who were not being fully supplied. The step was considered expedient to insure future health of the business.

The growth of manufacturer-owned retail stores spurted during this early post-war era. Sherwin-Williams, Glidden, Devoe, Fuller and Cook, among the older firms, resumed expansion programs which had been interrupted by the war. By 1948 it was reported that a 48% increase in manufacturer-owned stores had taken place in the past decade. At that time Du Pont was operating 58 retail outlets. In another two years this number would reach 60, the high-water mark in this endeavor.

This period also saw the first serious impact of so-called "local manufacturers" on the Trade Sales business. Opportunities for making and selling government specification paints during the war had attracted new firms to the business. Dissemination of formulation information provided by specifications and by raw material suppliers had greatly narrowed the gap in product quality between small "grinders" and the large manufacturers whose research had plowed the fields. Lower manufacturing costs, due to the absence of research and development charges, and lower transportation costs, due to servicing a restricted area, permitted lower selling prices for goods of mediocre but apparently adequate quality. Particularly with the paint contractor trade, where brand was of considerably less importance than price, the local manufacturers made inroads in the business of national firms to a greater extent than ever before.

Of minor note at that time – later to be of real significance – was an increasing interest in point-of-sale color matching service. Introduced by Martin-Senour a few years earlier, this principle was intriguing to dealers and manufacturers alike. Du Pont took a position of watchful waiting.

In 1949 occurred an event which was to have a tremendous impact on Trade Sales business. Glidden introduced a new product, Spred Satin, the first latex emulsion wall paint on the market. They placed stocks in the hands of some 9,000 dealers and the product enjoyed unusually fine acceptance. Painting was made easier for the do-it-yourself painter who was frequently the housewife. While the product itself was not of high quality, ease of application and easier "clean-up" after painting made an immediate appeal to a large share of the market.

Spred-Satin was followed in 1950 by Super Kemtone from Sherwin-Williams and Wallhide Satin Finish from Pittsburgh Plate Glass Company, and the "rubber-base paints" were off and

running. These products represented the first truly new development of major importance in the Trade Sales field since Du Pont's introduction of "Dulux" almost 20 years earlier. Not only did these paints capture a large amount of business but the trade impact was of great importance. The position which Du Pont had held as the leading innovator of new products was undermined with considerable loss of prestige. Many Du Pont dealers succumbed to the popularity of the new paints and took on the competitive brands.

At just this time the Korean conflict erupted and sales were curtailed because of material shortages again occurring. Once more, other industries than Trade Sales were given higher priorities by Du Pont. In the last quarter of 1950 we discontinued solicitation of new Trade Sales business and, because of the critical shortage of titanium pigments, purchased substantial quantities of Trade Sales paint from other manufacturers in order to supply the essential needs of our established customers. This situation delayed commercialization of our own latex emulsion product, "Flow Kote", which was being field tested at that time.

The "rubber-base" paints swept the Trade Sales field. In 1951, Sherwin-Williams reported the sale of 10 million gallons of Super Kemtone. In 1952, the industry total of these products was reported to be between 35 and 40 million gallons. Du Pont, a late starter, could not purchase enough latex in 1952 to supply our needs due to the pre-emption of the latex market by earlier arrivals. Our position with our own dealer organization suffered severely.

In 1952 a "new line" of painter products was introduced under the "Tufcote" brand. Most of the items included in the line were standard, first grade products packaged under a different label to sell at a lower price. This policy was considered necessary in order to meet competitive prices. While continued for several years, this program never proved popular with the trade and was not profitable for Du Pont. It was supplanted a year later by another program which provided for after-the-fact functional allowances to dealers who sold first-line products to painter-maintenance customers at reduced prices.

At this time (1952), however, Du Pont did make a forward stride by introducing "odorless" solvents which permitted a new marketing claim that regained some lost ground. Paints formulated with these solvents were test marketed in 1952 and offered generally the following year with considerable stimulation to the business.

In 1953 a significant policy change was decided upon and initiated. This involved the discontinuance of Company-owned retail stores. Three factors were involved in reaching this decision:

(1) Profits from the Paint Service Stores, as Du Pont's retail operations were termed, had never reached desired proportions.

(2) A study of Du Pont paint store operations conducted in 1952 by Mr. Oliver Benz, a retired Du Pont executive retained for this work, resulted in his recommendation that Du Pont discontinue retail stores and put its distribution emphasis on Company warehouses and dealer sales.

(3) Company policy statements by President Greenewalt and others, in the matter of relationship between small and large businesses, had made the point that the most appropriate role for big business was as a supplier to small business firms. It was felt that retirement from retail store operations would be practical evidence in support of this policy.

The implementation of this program, by converting some stores to warehouses and selling others to independent merchants, was largely completed in 1953 and 1954.

In retrospect, it is difficult to say that this decision was unsound. Although the Trade Sales earnings rate in the last year of full-scale store operations (1953 - 11.6% OE) has not been equalled since, it is by no means certain that the business would have prospered to a greater extent by following a different course. What does seem apparent is that, in discontinuing store operations, an error was made in not taking more aggressive action to build the business along other lines. As stores were closed or sold, the sales manpower thus represented was not replaced. No planned effort was made to improve service to dealers from plants or warehouses. As a matter of fact, field warehouse stocks continued to be reduced in an effort to lower investment and gain greater turnover. Other than trade announcements to the effect that Du Pont would henceforth employ a policy of "cooperation instead of competition", no substantial effort was made to offset the loss of direct-to-consumer business by improved support of dealer business.

In 1956, management elected to have another objective look at the Trade Sales business taken by an independent organization. McKinsey & Company were engaged to study "Improving Return on Investment in Trade Sales". This study was completed late that year.

The most significant conclusions outlined in the McKinsey report may be summarized as follows:

1. Present channels of distribution could not substantially increase our share of the home owner market and important increases in this volume could probably be secured only at selling costs which would reduce profitability of the business.
2. To get added sales volume, it would be necessary to increase our share of the painter and maintenance markets and "also tap some of the residential owner market now going through the large dealers".
3. The recommended route for accomplishing the desired objectives was to establish so-called "Company Distributorships" – in effect, warehouses selling direct to the painter-maintenance trade and also servicing dealers.
4. There is "lack of integrated planning and inadequate coordination" in Trade Sales, "attributable in large measure to the functional plan of organization" in effect at the time.

While in agreement with many of McKinsey's findings in this study, an analysis of the recommended course of action as outlined in (3) above revealed some important weaknesses. The Company Distributorships would differ from Company warehouse operations as then conducted only in a minor way, principally in accounting procedures. Consequently the sales performance could not be expected to vary to any significant degree from results previously achieved. McKinsey predicated profitable operation of these units upon sales volume per warehouse of minimum $300,000 and per salesman at an average of $125,000 to $175,000, rates which we had never been able to accomplish. They admitted that these assumptions were "perhaps the most critical in the whole analysis". There had never been much doubt in Du Pont's mind that our business would be made more profitable if this scale of productivity could be achieved.

The year 1957 witnessed the general change in Finishes Sales organization which consolidated line and staff functions in the Wilmington Office. G. F. Baldwin was appointed Trade Sales Manager with C. P. Culp and C. W. Dingle as Eastern and Western Zone Managers, respectively.

A number of policy changes effecting the Trade Sales business were instituted. Of first importance was the establishment of a new and separate sales section of Trade Sales called Industrial Maintenance Sales. W. D. Lawson was appointed first manager of this unit and served for six months in that capacity. Upon his promotion to Assistant Research Director, F. P. (Frank) Smith assumed this position.

The Industrial Maintenance sales responsibility included not only that portion of business formerly handled by Trade Sales involving large industrial and commercial users of maintenance paints but also business of maintenance-painting character heretofore handled by Industrial Sales to the Petroleum and Steel Fabricator industries. Shortly afterward, commercial Marine business, which was likewise primarily maintenance painting, was added. Thus all "large ticket" business done on maintenance paints, which are quite different from Industrial "paint-on-products" formulations and, in most cases, also differ from consumer products in character as well as selling methods, was in the hands of a special sales group which could prosecute this business according to its unique requirements.

A change in the dealer discount policy was also inaugurated, involving retroactive volume discounts which amounted to a weighted 3.2% of sales volume. This step was taken to try and counteract our rapidly deteriorating position with dealers, especially the larger accounts upon whose volume our business depended to a critical degree. The McKinsey study had confirmed what the Du Pont field organization had long been convinced of – that the merchants' profit opportunity with the Du Pont line was less than with almost any competitive line. While not recommending that this course be followed, the McKinsey report had stated: "As a result of our study we are convinced that dramatic increase in sales volume would be available to you relatively quickly through large dealers any time you were willing to offer discounts in line with those available from other manufacturers".

Subsequent events were to prove either that the McKinsey conclusion was invalid as to quick and dramatic increased volume, or that the form in which the larger discounts were offered was not approved by the Trade. In the latter respect, however, the "Bonus Profit Plan", the term applied to our retroactive discount, had been "sounded out" with representative customers with hearty endorsement resulting.

The product line also came in for considerable attention. Technical support of Trade Sales had been drastically curtailed in recent years, the number of chemists on this assignment having been reduced from 17 in 1951 to as low as 8 in 1955. This had resulted in product quality shortcomings which had serious effect. Du Pont Outside White House Paint and Du Pont white enamels, once considered standards of the industry, were overtaken in quality by competition at lower prices. These were outstanding examples of a disease which seemed to pervade the product line.

The technical effort was increased as rapidly as possible and, by 1959, technical manpower supporting this industry was built up to about the 1951 level.

An improved formulation of "Flow Kote" latex emulsion was now being marketed and represented the largest volume item in the Trade Sales line. Due to our having sold an inferior product under this trade name for several years many customers, however, were reluctant to stock the material, particularly with stocks of the old, unsatisfactory product still on hand. An aggressive program to clean out all dealer stocks of old material was undertaken, involving the disposal of about 100,000 gallons of old "Flow Kote" during 1958. The desired results were accomplished and the improved product began to make good headway.

An aerosol paint product, "Duco Spray Magic", was introduced in 1958. In 1958-'59, a Color Mixing machine was finally developed (through an outside contract arrangement with Comstock & Westcott, Inc.) which was an important supplement to a tube mixing system which had been introduced in 1954 and had enjoyed only mediocre success due to a rather limited color range and some product difficulties. The mixing machine, termed the Du Pont "Color Master", proved to be an accurate, easy to use device which soon became popular with progressive paint dealers. Within the next two years, more than 1400 of these machines would be in use in the field with considerable stimulation to the Trade Sales business.

Also in 1958 was introduced a line of professional painter products, deliberately formulated to sell at lower prices than first grade materials but designed to incorporate properties particularly desired by professional painters. Offered in bulk packages only and carrying lower profit margins to dealers, every effort was made to avoid encroachment on the consumer line. This offering was well received by dealers and by the craftsmen themselves. Over the ensuing three and one-half years – through 1961 – more than two million gallons of these products would be sold.

Research work on an acrylic emulsion house paint was productive of results and in 1959 the first "Lucite" House Paint was marketed. This represented an important advance in technology and helped greatly in restoring a measure of prestige to the Du Pont line.

As part of a general plan to give new life to Trade Sales, a complete revision of package labels was carried out in 1958-'59. A package design firm (Frank Gianninoto & Assoc., New York) redesigned all Du Pont paint labels with a view to modernity and simplicity. Products under the new labels began appearing in 1959. A number of product names were changed to gain more merchandising value and label directions for using the material were simplified for the benefit of the user. Trade reaction to the new label program was good.

Another facet which should be mentioned is in the field of national advertising. In 1957, with the advent of the "Bonus Profit" discount plan, management directed that all national advertising on Trade Sales be eliminated for the year to partially offset the cost of the increased trade discounts. National magazine advertising was resumed in 1958. Working with a new (to Trade Sales) advertising agency, N. W. Ayer & Son, an advertising campaign designed to create a prestige image for Du Pont paint was executed and represented a considerable departure from previous advertising efforts. While these were by far the best looking advertisements ever to appear over the signature of Du Pont paints, it was the philosophy of the advertising people that immediate sales results were not the object as much as the need to improve the stature of the product line in the public mind.

This program was continued in 1959 but was supplanted in 1960 by a strong TV advertising effort along different lines which will be mentioned later.

Continuing the chronology of events in Trade Sales developments, a Marine Sales group was established beginning in 1960. It was felt that the pleasure boat market was sufficiently large and unique to warrant specialized sales attention. The success of this effort remains to be seen but it is a promising market opportunity.

In 1960, technical work with acrylic emulsions culminated in the development of "Lucite" Interior Wall Paint. This product gave good results in use and it was decided to make this the "bellwether" of the line for a strong promotion effort in 1961. Capitalizing on the "no drip" properties of this thixotropic formulation, which is an important factor in home-owner painting, an advertising program was planned and executed – in 1961 – which represented the most expensive advertising support ever given a paint product. "Lucite" commercials on network TV programs were the backbone of the advertising effort.

The field sales force was expanded sharply and primary effort was devoted toward the sale of new dealer accounts. This proved very successful with some 5,000 new accounts added during 1961.

At the close of 1961, Trade Sales employed 264 salesmen handling "Regular Trade" business. This field force was directed by seven Regional Trade Sales Managers and 21 Field Managers.

The Marine section comprised seven salesmen under a Marine Sales Manager in Wilmington.

Industrial Maintenance field effort consisted of 33 salesmen directed by five District Managers.

To service the expanded dealer organization – and improve service to existing accounts – additional warehouses have been opened. An important change in principle in connection with warehouse operations has also occurred. All of these are now termed Paint Distribution Warehouses (PDW) and stock control is a sales responsibility. While it is too soon to tabulate the results, it is felt that although turnover of field stocks may not be so rapid as in earlier years, considerably improved customer service will result and that this will be of greater ultimate benefit to the Trade Sales business.

In some cases, PDW's are replacing independent distributors. This practice is being carried out wherever it is felt that Du Pont interests will be better served. The number of these stock points has reached 86 at the end of 1961 and further expansion is planned.

The matter of service to customers on Trade Sales materials and the effect on the business is a subject which warrants special mention. The shortages caused by World War II plagued us until 1948. Soon thereafter the Korean conflict again created similar problems with resulting penalty to customer service. In the period which followed, service again was affected to a considerable extent by internal policies which produced beneficial results in turnover of investment but which contributed in no small measure to serious service problems with Trade Sales customers.

The Control Division, which had responsibility for supervising field warehouse stocks of Trade Sales goods, had in 1949 begun to address themselves vigorously to reduction in transportation costs and field stock investment. This program was pursued with good results insofar as cost savings were concerned. Freight and delivery charges were reduced to a considerable extent and, in a 1958 report to Management, the following summary was given showing the extent to which Trade Sales Field Warehouse Stocks had been reduced over a span of years:

Year	Average Monthly Investment	From 1951
1951	$ 4,238,000	0.0%
1952	4,051,000	4.4%
1953	3,946,000	6.9%
1954	3,658,000	13.7%
1955	2,925,000	31.0%
1956	2,750,000	35.1%
1957	2,482,000	41.4%

It is without question that efficiencies in both shipping and turnover of warehouse inventories were accomplished. From the sales standpoint, however, customer service penalties occurred, the cumulative result of which could not be measured with the exactness of the savings figures. The endeavor to do more business with less stock on hand, worthy as the objective was, probably contributed as much as any one feature to customer dissatisfaction with the Du Pont line. It also proved demoralizing to the sales force whose efforts were being severely handicapped through inability to deliver goods during peak demand periods.

In taking a summary view of Du Pont's Trade Sales business over the past 15 years, several facets stand out. The Trade Sales market has expanded tremendously within this time. Du Pont has not kept pace with this growth. From 1950 the earnings rate has been declining, culminating in an OE loss experienced for the first time in 1961.

The reasons for this trend are probably found among the circumstances described in the above review. Principal factors have been increasing competition from low-cost, "hungry", sectional suppliers; worsening trade relations with customers at various times due to material shortages; rapid growth of competitive company-owned stores with proportionately less market opportunity for independent merchants; laggard Du Pont effort in keeping abreast in technology; customer service which left much to be desired on frequent occasions; a weakening of morale on the part of the field organization due to the many handicaps beyond their own control.

On the brighter side, there is reason to hope for future improvement. The product line is now in a greatly improved position as to quality. The weight of strong advertising effort supporting a better product line is creating genuine consumer demand for the first time since the early days of "Brush Duco". Of as much importance as the actual business thus generated is the fact that the Du Pont dealer franchise has again become desirable. The sales organization can escape from the defensive position forced upon it for so many years and take necessary steps aggressively to solicit new business without fear that reprisal on the part of established dealers would have crippling effect.

The Industrial Maintenance specialized effort has not only produced good results to date but is putting Du Pont in far better position to develop this profitable business for the future. Here again, we have a product line which has been carefully evolved over the last few years to meet the unique requirements of this business. The sales effort in this field will undoubtedly be expanded and this segment of business should become increasingly profitable. It would seem possible that, if the cost of promoting the consumer line should prove to be more than can profitably be done on a continuing basis, the IM segment could become the mainstay of a satisfactory Trade Sales business. It is in this area of work – dealing with technically competent customers where product performance outweighs marketing strategy – that Du Pont historically has made its greatest progress.

Trade Sales is an old and difficult business in which to make the kind of profit return Du Pont seeks. It is probable that if we were not committed, the yardsticks which are applied to new investments would rule out our engaging in it. Many people have worked diligently in many ways for many years to improve the profitability, some of which effort and money might have produced better results if directed elsewhere. We are heavily committed, however, and it is probably good business – and certainly good conscience – to exhaust continuing effort to try and make it turn a bright corner. Du Pont pride alone hardly permits any other course.

Ref. = Charts F, G

REFINISH SALES

In 1947, Du Pont Refinish annual sales volume reached almost $16,000,000 and had become a major industry. This was proving to be an unusually stable market. During periods of high economic activity, car dealers repainted more used cars and car owners afforded the luxury of good appearance maintenance. In slow periods, car owners retained their vehicles over longer spans and some repaint work was usually required to maintain their investment.

The constantly increasing vehicle population represented not only an ever-broadening market but inevitably created more accidents which usually involved some repainting. Wider insurance coverage by car owners provided more funds for accident repairs and this factor contributed more and more importantly to refinish work.

The advertising value of handsomely painted and lettered trucks also became more generally appreciated by business firms and encouraged more and better painting of these vehicles. All of these factors would support a constantly growing Refinish market for years to come.

The greatest advantage possessed by Du Pont – and greatly responsible for maintaining a leading position in the Refinish field – was the usage of its products by auto manufacturers on new cars. Auto refinishers learned that the most satisfactory paint repair work could usually be done with the same material used in the original finishing operation. Although refinishing was done with an air-dry counterpart of the factory used product, better color matching was invariably obtained through use of the same type and brand of material.

Whether practical or psychological, the same line of reasoning was found also to prevail among automotive jobbers in selecting the "replacement parts" lines they would handle. A manufacturer with a "position" in original equipment at Detroit had a big advantage in selling his line to the replacement market.

Hence the user of the product – the auto painter – and the seller (in this case the automotive jobber who was Du Pont's customer) were favorably prejudiced. The product line had been carefully designed with painter preferences first in mind. The price and discount schedules had been carefully evolved and were considered eminently satisfactory by all concerned. The field

organization had been well trained primarily as service salesmen. The Du Pont Refinish line enjoyed a splendid position in the market place. It was well prepared for the growth period ahead.

In 1947, Refinish Sales in the field offices were being directed by W. B. (Barney) Jones in Atlanta, K. Y. (Ken) Wright in Boston, A. P. (Art) Lins in Chicago, W. S. (Bill) Lunger in Cleveland, A. K. (Andy) Mearns in Philadelphia, J. E. (Jack) Boyles in Dallas and C. M. (Carl) Buittner in San Francisco. Of those men, only Boyles would continue active in Du Pont's paint business for the entire period of this chronicle.

1948 was the year in which the last of our Refinish distributors (the Arthur Fulmer Company of Memphis, Tennessee) was eliminated from our distribution chain. As was recounted in Mr. Zintl's earlier record, these organizations had played an extremely vital part in the development of Du Pont's Refinish business. Recognizing our own inadequacies in serving an entirely new market, alliance with these specialists who were, in most cases, very familiar with the class of trade who would use our products, had served to gain for Du Pont a rapid and sound entree to the "carriage painter" trade. The part such men as Ed Jones, Ross Stewart, Arthur Fulmer, Otto Holcker and others who headed "Duco" distributing organizations played in the successful development of the Du Pont Refinish business should be long remembered for the principle that this distribution plan represented in introducing a new product to a new market.

At about this time (1948) our competitors in the refinish market began actively to promote mixing machines for paint shop and jobber usage. These devices, used in conjunction with single pigment base colors and mixing formulas supplied by the manufacturer, permitted point-of-sale development of the desired shade, thus avoiding large inventories and service delays. This was very largely a competitive defensive measure to offset lack of a complete line of production colors.

Du Pont kept a wary eye on this development but at that early stage did not elect to engage in similar effort. The competitive move, however, gained much impetus and by late 1951 Du Pont joined the trend and released what was termed the "Dulux" Blending Service to its jobber customers. This was followed in 1955 by a similar service applicable to "Duco" lacquer. In each case, trade acceptance was very good and sales increases resulted. A corollary benefit was a reduction in obsolescence which benefitted Du Pont finished product inventories.

It would be appropriate at this time to make reference to an element in the Du Pont Refinish program which had considerable influence on the acceptance and popularity of the line among automotive jobbers. This was the matter of including a formal "obsolescence plan" as an integral part of the franchise. This action was not taken in the early stages of our dealings with jobbers but was implemented in 1937. It consisted of a contractural agreement to accept the return of slow moving items at periodic intervals at a modest (10%) cost penalty. Although it was originally feared by Finishes management that this would result in substantial losses from the return of unsaleable merchandise, it proved to be a means of greatly stimulating the maintenance of complete color stocks by jobbers which, in turn, made for excellent customer service with resulting gains in volume and acceptance for the line.

It should be mentioned here that the "Calibrated Mixing Set", referred to in Zintl's earlier account of this business and which was developed in 1934, was the forerunner of the mixing machine practice which would later vitally affect not only Refinish but also the larger Trade Sales market. Dave Goldich was the inventor of this idea which, of course, had as its basic theme the principle of point-of-sale color mixing in order to provide flexibility in servicing customer needs. While the original device fell short of accomplishing the desired results, the idea was implanted, later to be developed into the color mixing machines which would have profound effect on the entire industry.

In 1955 the first automobiles were factory finished with "Lucite" acrylic lacquers. Du Pont promptly released air-dry counterparts in this line to the Refinish market. Having another "first" in automotive finishes not only increased sales through the need for the new products in the "Lucite" refinishing system but added to the prestige of Du Pont throughout the automotive industry. Especially in the so-called after market, a position of prestige "at Detroit" is of great value in influencing business.

In the Spring of 1957, relatively soon after his return to Wilmington from the position of West Coast Regional Sales Manager, J. T. Edgerly passed away. In any account of the history of Du Pont's paint business, Jack Edgerly's name should be given a prominent place. It is a certainty that no other one person contributed so much as Edgerly to the successful development of what

has proven to be the most consistently profitable segment of Du Pont's finishes business – automobile Refinish. It was Edgerly who almost single-handedly directed this business from its very inception to its maturity. He had good assistance but in almost every case he selected and developed the men. Edgerly realized the extreme dependence of Refinish on Du Pont's auto manufacturer business and constantly sought ways and means of tying the two ever more closely together. He secured auto manufacturer endorsement through the car makers' Service Departments and in their field activities. He initiated and built to unequalled stature the principle of color service bulletins which is the backbone of Refinish sales service effort. He planned and directed the development of the distribution system which has proven so sound and profitable over the years. He instituted sound policies applying to every phase of the business from product development to price and discount structure and type of sales effort required. He was held in extremely high regard by his own organization, by customers and by competitors.

Edgerly's knowledge of paint in automotive usage coupled with his diligent and effective efforts over the years resulted in a great and lasting contribution to Du Pont's progress and present position in this great industry.

From 1932 through 1956, Refinish Sales were directed in the field by the Regional Sales Managers. From 1947 through 1956, the Wilmington Refinish staff function was directed by R. R. (Bob) Allen who had moved to that position in 1946. Fortified by many years of field sales experience, Allen counseled freely with the field sales organization. With the business in a basically sound position and continuing a satisfactory growth and profit pattern, few innovations were needed or proposed. Relatively minor price changes were made to offset rising production costs. Distribution was expanded through the establishment of several more Refinish Service Warehouses and the sale of the line to more jobbers.

In 1957, with the general change in the Finishes Sales organization previously referred to, and line and staff functions consolidated in Wilmington, G. H. (George) Berlin moved from the Kansas City Regional Managership to the Refinish Sales Manager's position, with R. R. Allen and G. A. (George) Massih as West and East Zone managers respectively. This organizational lineup obtained until mid-1959 when Berlin succeeded G. F. Baldwin as Trade Sales Manager and

Massih assumed the Refinish Managership position. All of these men had had considerable field sales experience in earlier years with the Refinish line and were familiar with the problems of the industry as well as with the policies and practices which had contributed so much to gaining for Du Pont the position it enjoyed.

In 1959 one of the few merchandising innovations in the conduct of this business was introduced – the payment of a functional allowance to jobbers on sales to commercial vehicle and industrial accounts. This served to place Du Pont jobbers in a competitive position with paint manufacturers seeking to build volume in this field via direct sale to such customers at low prices. The results are reported to be quite satisfactory.

In discussing distribution policies, it should be recorded that in first establishing Du Pont warehouses for field service (RSWs), each stock point made a very serious effort to develop direct-to-user business. At each RSW, one or more salesmen devoted exclusive effort to paint shop selling.

Over the years it was determined that, in this trade, a more efficient and effective marketing job could be done by concentrating Du Pont sales effort on jobbers and assisting those merchants in performing the sales function to the paint user. Direct sales to refinish shops were allowed to wither and after 1958, when sales volume generated in that manner amounted to only a half million dollars, this business was no longer reported as a sales category.

Direct selling to commercial truck body builders and large truck fleet owners continues but now (1961) represents less than 10% of Refinish annual volume.

To measure the trend, it may be noted that as late as 1948 - 49, direct sales by Du Pont to users represented more than 20% of total business. The withdrawal of this effort has accomplished, among other things, a strengthening of relationship with the primary customer, the automotive jobber.

In late 1961 a "Blending Service" on "Lucite" lacquer – similar to the mixing programs with "Dulux" and "Duco" – was released and should provide corresponding future benefits to the Refinish Trade.

Refinish Sales, at the close of 1961, employed 129 salesmen directed in the field by six Regional Refinish Sales Managers and 27 RSW Branch Managers.

In taking a summary view of Du Pont's Refinish business from its earliest beginning to the present time, there are several cardinal features which impress one. The products filled a vital need and new items were added to the line not with the thought that a demand might be generated for them by promotional effort, but only as real user needs were determined. The line from the start was sold through channels which represented close kinship with and thorough knowledge of the trade who would use the materials – and the advice of these tradesmen was constantly solicited and followed to the best of our ability. The line from the beginning carried with it good profit-making opportunity for the merchant who sold it. The profit position of the middleman – distributor or jobber – was given first consideration in all policy changes which were implemented. Price changes were made with as close an eye to the competitive situation as to our own costs, sometimes resulting (as in instances with low-priced thinners) in extremely marginal return for Du Pont on an individual item but keeping the distributor or jobber in the forefront of the race for sales position in his market area. Fast service to the Refinish Trade on new colors as adopted for new car production was recognized as an absolute must, and resulted in devising many plans for insuring the speediest possible production and distribution of these materials.

In other industries served by paint there also are continually changing preferences in color but there is not the dramatic spotlighting brought about by annual year-model change. As a consequence, the necessity for keeping fully abreast often does not get similar high priority attention.

If Du Pont is able to retain its relative position in the automotive manufacturing field, a continuation of the stable policies which have developed Refinish to its present stature should insure the growth of this business for years to come. Should Du Pont yield its position at Detroit to others, we would face a monumental task in maintaining our present share of the Refinish market. The sound structure upon which this business has been built would insure a long period

of vigorous and profitable existence under almost any circumstances but usage on new cars is the greatest attribute. Hopefully this position will long be held and Refinish Sales will continue to make its truly remarkable contribution to Du Pont Finishes success.

Ref. = Chart H

CHEMICAL SPECIALTIES SALES

By 1947, Chemical Specialties was a well established, profitable part of Finishes Division business. While the line included a widening variety of consumer auto maintenance products, No. 7 "Duco" Polish was still the backbone of the business. This product had then been on the market for 22 years and was contributing the bulk of Chemical Specialties sales of about five million dollars annual volume. Jack Riley, the first sales manager for the product (and the man who devised the "No. 7" name) had left Du Pont more than 20 years earlier because he was convinced that auto polish would be a short-lived business due to the long-lived beauty of "Duco" finish. G. W. (Bert) Sherin had succeeded Riley as Sales Manager in 1925 and directed the business nationally from the Wilmington office.

In 1947 – and to continue for another 10 years – Chemical Specialties sold cellulose sponges to the automotive trade for the account of the Cellophane Division which manufactured the product. Sales volume amounted to about one million dollars annually. The success enjoyed with this item, which was a departure from the type of product comprising the "No. 7" line, led to interest in other consumer products which might be offered for other than strictly automotive usage. In 1950 a short line of so-called "Household Products" was test marketed in several cities with quite satisfactory results. This led to the establishment of what later was to be a special sales section to handle these products. Included for test sale in 1951 was a household bleach which had initial success during early trial marketing stages but which was abandoned in 1954 due to later disappointing indications.

For the growing automotive market, Gas Guard was introduced in 1948, Spray Glaze in 1949 and Anti-Rust and Water Pump Lubricant in 1951. Each of these products contributed significantly to increased volume and profits.

In 1951, Sherin reached retirement age after 26 years of Du Pont service devoted entirely to the development of the Chemical Specialties business. During this span the annual volume had grown from a few thousand dollars to almost $7,000,000 – plus the sale of two and one-half million dollars in cellulose sponges for Cellophane.

Bert Sherin conducted the business along conservative lines with profit for Du Pont as his primary objective. How well that objective was realized can readily be seen from a glance at the figures which are charted.

Sherin was meticulous in detail. He was slow to adopt new products or new ideas. While not regarded as a brilliant merchandiser, his policies served to consolidate all gains made and in that way insured unspectacular but steady growth. He was highly regarded by customers and competitors alike and was a good business head throughout the entire development stage of this novel (for Du Pont) line of specialty consumer products.

Upon Sherin's retirement, H. R. (Harry) LaTowsky, who had served as Assistant Sales Manager since 1929, succeeded to the Management position and the direction of Chemical Specialties Sales remained in experienced, capable hands.

In 1953 the small sales group which had been selling Household Products was augmented by the transfer of several automotive products salesmen and plans were made to expand this business. In the following year, however, the Film Department decided to handle their own sales of cellulose sponges to all but the automotive and hardware trades. This reduced the sales volume handled by the Household Products group to such an extent that on January 1, 1955, that special sales section was discontinued and all Chemical Specialties sales were again handled by one sales organization. This practice continued until 1959 when the entire sponge business – manufacture as well as sales – was taken over by F. & F. from Film. At that time a Household Products sales section was again established to handle the sale of sponges, sponge yarn and some cements, waxes and similar household specialty products.

Additional automotive products had been added to the No. 7 line in the intervening years. Brake Fluids in 1954, New Car Wax and Fast Flush in 1955 and Motor Oil Additive (MOA) in 1956 were among the many products. Each of these items added important new volume. In 1956, New Car Wax sales amounted to $2,700,000, the largest annual sales volume achieved by any of our products in its first year on the market.

In 1956 a policy change was introduced with the adoption of a "redistribution" plan. This provided a functional allowance (10%) for the sale of the line by large jobber customers to smaller

jobbers. The results of this practice are considered by Chemical Specialties to have been very satisfactory in securing added distribution through smaller outlets in outlying locations.

In 1960 a new segment of the business was established with the introduction of the Marine Specialties line. Some 24 items consisting of marine trademarked sponges, oil additives, corrosion inhibitors, engine cleaners, waxes, polishes and waterproofers make up the "7 Seas" line. These products are sold to the pleasure boat market through commission agents. Volume in the introductory period has been slow in developing but the market opportunity is substantial and a serious effort is being made to gain a foothold in it.

Automotive Specialties, at the close of 1961, employed 75 salesmen directed in the field by 11 Field Managers or Supervisors. The Household Specialties group comprised 10 salesmen under direction of a Wilmington Manager.

The Chemical Specialties sales and earnings record discloses several factors warranting note. The Household Products business has not been able to maintain the rate of earnings which in the past has been inherent to Chemical Specialties. Coupled with a profit squeeze which lowered Automotive Specialties earnings rate, and a loss in introducing the Marine Line, total Chemical Specialties operative earnings rate reached its lowest ebb in the history of the business in 1960 and 1961. By coincidence, the sales volume in 1961 of some $11,000,000 more than in 1955, produced dollar earnings of about the same amount as in that earlier year which was the peak of OE rate accomplishment.

The market is becoming more highly competitive with each passing year. Auto manufacturers encourage their dealers to sell proprietary brands of many items similar to those in our line. Petroleum companies do likewise to their service station dealers. Large retail chain stores emphasize private brand products – usually at greatly reduced prices. In the Household Products field, competition for the consumer dollar through grocery store channels probably reaches its frenetic zenith.

While the Du Pont name is greatly respected in consumer as well as trade channels, Chemical Specialties users are not highly discriminating in their selection of this type of merchandise. Price premiums are difficult for retail sales clerks to justify.

It would seem that the best hope for survival in this business will lie in providing a continuing flow of new products with unique appeal, strongly supported by ever more costly consumer advertising. Fully realizing the difficulties of conjuring up "products with unique appeal", a major effort to search out market needs in areas akin to our primary fields of interest would appear to be a stern and continuing requirement.

In trade circles, Du Pont enjoys special stature among automotive jobbers. It is likely that more rapid success will be gained with products moving through those channels than in other fields. An "America on wheels" will continue to hold vast opportunity for specialty items to serve this great market.

Ref. = Charts I, J

EXPORT SALES

In 1947, the Finishes Export Sales section was directed by R. A. (Ralph) Plowman, a long service employee who had been concerned with Du Pont's foreign business throughout most of his career. Plowman had been in the New York office of the earlier day Du Pont Export Co. following World War I and was Export Sales Manager for Finishes in 1924. Following a number of other assignments, Plowman again assumed the F. & F. Export Sales Manager's position in 1946 and held it with distinction until his retirement in 1958 after 46 years of Company service. It is sadly related that after an all too brief retirement, Ralph Plowman passed away in 1961.

Finishes export sales volume in 1947 set a new high of $6,700,000. At that time it was estimated that Du Pont enjoyed the leading position among U. S. firms in exporting paint, exceeding the volume of such companies as Sherwin-Williams and Pittsburgh Plate Glass. It was noted that in total our hardest competition was coming from lesser-known firms who had not previously been encountered in export markets.

At this time, Du Pont was in the process of terminating agreements of long standing with European firms who had been making and marketing "Duco", under appropriate licensing arrangements, since the advent of that product. Contracts with Societe Francaise Duco were terminated in 1947 with that firm retaining its exclusive right in France to existing Du Pont processes and patents in the "Duco"-"Dulux" field and to the "Duco" trademark, but surrendering its right to future Du Pont technical information and exclusive licenses under future Du Pont French patents. In return, Du Pont gave up its stock interest in SFD and royalty rights.

Similar steps were taken with Duco AG – Germany and, soon thereafter, with DuPerial Brazil.

While these steps were not directly concerned with Finishes Division export sales, they did bear on the Company's position in foreign markets in paint and are mentioned accordingly.

In 1948, scarcity of dollars in foreign lands handicapped export business. More countries were also placing restrictions on imports to encourage local industry. General Motors Export Corp. in So. Africa diverted its paint business from Du Pont to a local ICI affiliate. Du Pont export volume receded, as did that of other U. S. paint exporters.

To meet this situation, some firms began to take steps to engage in foreign manufacturing. Sherwin-Williams and Mexican capital joined forces to construct a plant in Mexico. Devoe licensed a local firm in that country to make their product line. In 1951, when Mexico imposed new, heavy duties on paint imports, Du Pont began to act. Our export sales to that country had dropped from $587,000 in 1947 to $50,000. A project was approved in the spring of 1952 for a finishes plant in Mexico City and was carried to swift completion that same year.

The development of similar situations in Venezuela and Cuba prompted similar Du Pont steps in those Latin-American countries. When export sales of $687,000 in 1952 dropped to $175,000 in 1956, a paint plant in Venezuela was constructed which began operations in September 1957. The Cuban plant was started in 1957 and began producing in late 1958. Unfortunately, this venture was to result in total loss when the Castro regime gained power and expropriated the property.

Early in 1958, the long range implication of the establishment of the European Economic Community and the announced policy of important customers to change from imported to locally made finishes for reasons of better service and broad community relations, forecast our inevitable loss or substantial reduction of this market unless local manufacture of Du Pont finishes was started promptly. It was anticipated that an European plant and organization would hold present business, secure additional near term business at lower selling prices, and place Du Pont in a position to grow with the higher level of business activity expected with the trade development of the Common Market. A project for a finishes plant in Malines, Belgium, was approved in May 1958 and production started in December 1959. While the primary market for a Belgian plant was the Benelux area, shipments have been made throughout Europe and to countries in the Middle East and Africa as production capacity increased.

While the establishment of foreign plants has meant a loss of export business, it has preserved finishes business for Du Pont that would otherwise have gone to local manufacturers in the countries involved. A brief summary of Finishes Sales and Operative Earnings for the periods of operation of the plants indicated is shown on the following page:

	1952	'53	'54	'55	'56	'57	'58	'59	'60	'61
					(Thousands of Dollars)					
Mexico										
Sales	369	715	772	1,197	1,691	1,778	1,966	2,231	2,151	2,494
O.E.	(2)	85	171	261	528	386	482	512	381	458
Venezuela										
Sales						913	587	932	1,099	1,024
O.E.						(237)	(173)	(32)	(88)	(117)
Cuba										
Sales								1,227	1,260	--
O.E.								(118)	(29)	--
Belgium										
Sales									2,497	3,347
O.E.									158	603

Until 1958 the Du Pont Foreign Relations Department functioned in a coordinating, advisory capacity with F. & F. and other industrial departments. It was responsible for foreign investments and had a Foreign Trade Development Division which traveled field men selling the products of industrial departments which did not have their own field organizations as did F. & F.

Beginning in 1958, the Foreign Relations Department became the International Department with a changed scope of responsibility. It became an operating department and as such took over foreign manufacturing operations and sales made from those facilities.

With increased local manufacturing abroad in countries with relatively stable economies, and with political and economic uncertainties in many other areas, F. & F. Finishes Export Sales has had to struggle mightily to maintain a volume equal to that enjoyed in earlier years. That it has done so to a considerable degree is a tribute to the effective work of the Export Sales organization.

Upon Ralph Plowman's retirement in 1958, the position of Export Sales Manager was taken by H. A. (Harold) Madieros who had served for some years in Finishes Export Sales as salesman, district manager, and assistant sales manager. Madieros occupied this position for a period of only four months, however, before transfer to Belgium to serve as sales manager for finishes produced at the new Belgian plant.

L. A. (Lou) Rossi next occupied the position of F. & F. Export Sales Manager, but once again a quick transfer ensued. After five months, Rossi was made a Du Pont products sales manager in Mexico, where his past experience in directing Latin-American finishes sales would serve to good advantage.

Rossi was succeeded in July 1959 by H. H. (Hanson) Hodge, a Finishes employee of long experience and one who had served in finishes export work for a period of 17 years prior to holding other positions of domestic responsibility in finishes sales. Hodge carried to his assignment a fine knowledge of the principal Du Pont finishes export products and an excellent background of foreign marketing.

In studying present finishes export business – with particular reference to changes which have taken place over the period covered by this account – a few figures on the industries served and geographical distribution of the business are of interest. The following table shows the proportionate amount of total finishes export volume represented by each industry for the years indicated:

	1952	1961
Refinish	35%	32%
Trade Sales	25	25
Auto. Mfg.	17	5
Industrial	20	26
Specialties	3	12
	100%	100%

The decline in Automotive Manufacturing and Refinish business is explained by "competition" now encountered from Du Pont over-seas plants. The increased Industrial proportion represents added volume from new products such as wire enamels, can coatings and adhesives. Specialties business has increased due primarily to business secured through Army Exchanges (PX at over-seas bases) and the sale of cellulose sponges, an item not handled in export trade by F. & F. in earlier years.

Geographically, changes are shown as follows – the figures again representing proportionate amounts of total finishes exports going to the respective areas indicated:

	1947	1960
Europe	17%	21%
South America	23	6
Other Latin America	28	39
Africa	1	2
Asia	7	8
Canada	-	9
General Motors Export	18	1
All Others*	6	14
Sales Volume	$6,730,130	$6,376,934

*Principally Australia and Army-Air Force Exchanges

This table reflects, in addition to changes due to the establishment of foreign manufacturing facilities, the export to Canada of finishes formerly supplied by Canadian Industries Limited and not as yet available from Du Pont of Canada production. It also shows the impact of loss of GMX business – to Du Pont plants and other local suppliers – which at one time (1955-56) amounted to more than one million dollars annual volume.

The course of Du Pont finishes export business has probably been quite typical of American industry experience. Shrinking opportunities due to the growth of local industry in most over-seas areas has made it necessary to run continually faster to stand still in volume. Since domestic merchandising success has relatively little carry-over effect in foreign lands, value-in-use of the product has highest importance. A sound product line would seem to be the prime requisite to permit the able Export Sales organization to remain a stable element in Du Pont Finishes activities.

Ref. = Chart K

DOMESTIC TRANSFERS

Transfer business to other Du Pont departments has consisted mainly of maintenance finishes, ester plasticizers, and UF resin anchor coatings for cellophane. The plasticizers were an outgrowth of manufacture of dibutyl phthalate plasticizer for "Duco" Lacquer. The water-soluble UF resins were an outgrowth of the technology of UF resins developed for paints.

As the ester plasticizer market has become more competitive, market prices have been forced down drastically. This has sharply curtailed profit margins. In some cases, plasticizers have been sold by competitors at prices which reflected return on raw materials only. As examples, dicyclohexyl phthalate, one of the plasticizers used in moistureproof coatings for cellophane, had a transfer price of 55¢ per pound in 1956 with O. E. of 60%, compared with a transfer price of 46.6¢ per pound in 1961 and O. E. of 19%. Prices on dioctyl phthalate have been depressed to less than our out-of-pocket replacement cost. As a result, this plasticizer is now purchased outside the Company.

In the area of interdepartmental business, one significant change became effective in 1961. F.&F. usage of acrylic products in finishes, spurred by the increased volume of "Lucite" lacquer, exterior house paint and interior wall paint, mounted rapidly and the department became a major consumer within the Company of acrylic monomers for non-plastic uses. These materials had been obtained on a transfer basis from Polychemicals Department who conducted methacrylate manufacturing operations at the Belle plant. To provide maximum profit incentive, the Belle investment in acrylic manufacturing facilities, beginning in 1961, was allocated to the three interested departments (Polychem, Elchem and F. & F.) and the acrylic products produced were henceforth supplied to F. & F. on a cost basis. This arrangement is expected to represent an improved earnings opportunity for F. & F. Finishes while providing further incentive to develop added business in the field of acrylic coatings.

The handling of domestic transfer business has been a responsibility of the Director of Sales. During his tenure as Assistant Director of Sales, J. W. Nestor supervised this business, followed by J. B. Dietz. From 1952 until 1957 it came under the direction of F. H. Beadles while

he occupied an Assistant Director of Sales position. Since that time, R. B. Davis has had this responsibility.

Ref. = Chart L

RESEARCH

In 1947, F. & F. research was being directed by John Marshall, who had occupied this position since 1936. J. D. (Dorman) McBurney was Asst. Director.

Marshall was a great pioneer in the field of finishes research. Starting with Du Pont in 1913, he later reorganized and became the first director of the finishes Central Technical Laboratory in Philadelphia. He was a dedicated man of superior knowledge in the protective coatings industry. Especially noteworthy were his abilities in the fields of alkyd and urea formaldehyde resins. Marshall probably made as many contributions to the technical advancement of Du Pont's position in finishes as any other individual.

Finishes research work in 1947 was conducted largely at the Philadelphia and Parlin laboratories. Parlin concentrated attention principally on nitrocellulose products, with assist from the smaller Flint laboratory on strictly Automotive Manufacturing finishes developments.

At Philadelphia, research was under the direction of J. B. (Jim) Bullitt with J. W. (John) Iliff as Assistant Director and C. R. E. (Chris) Merkle as Supervisor of Technical Service and Sales Development. Here Iliff directed the work of some 35 research chemists while Merkle had 26 under his supervision, principally on Sales Development effort.

Parlin, the home of "Duco", had a laboratory force of 43 chemists under the direction of G. E. (Ed) Conde while at Flint R. B. (Roy) Davis managed a staff of 17 chemists working in support of the rapidly growing automotive business. Technical support effort in behalf of Chemical Specialties was also done at Flint but represented a minor effort.

Since at that time there was not an independent Plants Technical force (B group) at any location, the above noted figures included those technical men whose responsibilities were in that area.

John Marshall died in 1949. In recognition of his many achievements, the new finishes laboratory at Philadelphia – which he very largely planned – was named in his honor when opened in 1950.

John Iliff was appointed the first director of the Marshall Laboratory. He was followed in this position by Roy Davis in 1952 and, in 1956, by Russell Morgan, the present incumbent.

Upon the opening of the Marshall Laboratory in 1950, research work formerly done at Parlin was transferred to the new facility. Henceforth the Marshall Laboratory would be the center for finishes research in all areas of interest. Flint would continue to work on automotive technical problems but this would be principally in the nature of sales support effort.

G. D. (George) Graves succeeded Marshall as F. & F. Research Director and served in that capacity until mid-1956. Graves came to F. & F. from research work in Du Pont plastics and brought an objective point of view to the research program of this department.

A significant reorganization of finishes technical activity took place under Graves' administration. Long range work was more fully segregated – if not isolated – from short range "sales technical" and process effort. Graves felt that the latter areas were not proper functions for the research organization and subscribed to the view of placing "C" work under the direction of the Sales Department. Finishes Sales also felt that this work would be more effective if directed by Sales and urged such a change. At the request of F. & F. Management, a study of the matter was made by the Development Department and when that report endorsed the transfer of responsibility, the change was made on January 1, 1954.

In retrospect, it is not easy to judge the net effect of this change. Under Sales direction, the "C" work in support of Finishes has accomplished much, as is covered in some detail in a following section. Undoubtedly the effort has been more responsive to current Sales Department needs by being under direct Sales authority. To what extent, if any, the caliber of work might have been improved under sympathetic direction by Research Management will, of course, not be known. Whether – and to what extent – a greater degree of independence, while providing flexibility of action, might be offset by a lesser amount of continuous guidance from the best technical minds in the Department, is an open question. Whether the benefits of a supposedly greater degree of sales orientation fully compensate for lesser integration of effort on the part of all technical personnel in the Department can be viewed from different angles.

Certainly under the situation prevailing at the time this step was taken, the change was for the best. Graves' administrative contributions were of great value to the Department – including new methods for research control, improved personnel handling procedures, the introduction of

economic analysis into research programs, the centralizing of the patent section – and his prosecution of the "Lucite" automotive lacquer program was a distinct technical achievement. His lack of enthusiasm for short range work, however, had some unfortunate results. Improvement of current products in several areas suffered to the point that Du Pont lost position to other firms who apparently were more attentive to immediate problems and who sought routes for influencing customer acceptance of modestly improved current-type finishes. This was particularly true in Trade Sales and Industrial fields as has been noted in the sections of this account dealing with those industries.

In 1956, Graves was transferred from F. & F. to the Textile Fibers Department and J. B. (Jim) Bullitt became F. & F. Research Director. Bullitt had been engaged in finishes research effort since joining the Company in 1926, had been a director of the Philadelphia Laboratory and an Assistant Director of Research since 1949. He had an excellent background of technical knowledge in finishes which enabled him to give sound technical guidance to all finishes research work.

Receiving much attention at this time were the programs concerning acrylic paints for Trade Sales' usage, both exterior house paint and interior wall paints. The former would soon (1959) be marketed as "Lucite" House Paint and in 1960 the interior product – "Lucite" Wall Paint – would become the bellwether of the Trade Sales line. Bullitt made important contributions to research effort in behalf of these important products but did not live to see the fruition of his work. In mid-1957 he suffered a fatal illness and died after one short year at the F. & F. research helm.

Bullitt was succeeded in May, 1957 by C. W. (Clem) Theobald. After some 10 years of work in the Central Research Department, Theobald had been in Film Department Research for four years prior to his new assignment with F. & F. In the course of his prior experience he had been closely associated with work on a leather replacement product, a project now an F. & F. responsibility.

An able and broad-gauge administrator, Theobald brought to this department a somewhat changed concept of the primary function of departmental research effort. In his view it was the

first responsibility of the Research Division to assist in defining the best new investment opportunities for the department and direct research effort accordingly. Execution of this philosophy resulted in increased emphasis on "scouting" work, seeking new leads in areas where success would bring into being new businesses of a character related to the department's basic interests. "Practical creativity" may be a term descriptive of this broad objective.

Theobald's assistant in directing F. & F. Research was W. D. (Bill) Lawson who was, however, transferred to Sales after a brief tenure in this position. He was succeeded by J. A. (John) Klacsmann who had been active in F. & F. research work at Newburgh, Fairfield, Marshall Laboratory and the Experimental Station for 10 years past. The management team of Theobald and Klacsmann, currently directing F. & F. Research effort, provides not only a high degree of technical capability but an executive approach to the handling of R & D work which portends well for the long-range future.

No longer is Du Pont almost alone in the coatings industry in the prosecution of research in depth. "Glidden's new central research laboratory will occupy 38 acres" and "Sherwin-Williams purchases site for new research center" are typical of news items which indicate the intensified competitive technical effort. Raw material suppliers to the industry conduct more and higher caliber research, the benefits of which are quickly available to all finishes manufacturing customers. Smaller companies select specialized segments of the market on which to concentrate and become increasingly competent in meeting special needs.

The matter of greatest immediate concern is whether Du Pont paint technology will keep fully abreast of competitive advances and insure holding a leading position in the industry over the intermediate range while our long-range objectives are in the course of development. Whether primary responsibility for accomplishing this rests on Sales Technical or Research, is a question secondary to the Du Pont need that it be done.

To get a summary view of finishes research activity over the 15 year span of this account, Research was asked to furnish a selected list of research developments carried out in this period. Dorman McBurney, Research Development Manager, with the thoroughness so characteristic of

this gracious and able scientist, has provided a detailed description of the most important projects. This has considerable historic value and consequently is included in entirety as a supplement to this report.

Separate comment should also be made of the work of the Patent Section of the Research Division over this period. Under the efficient direction of P. B. (Paul) Cochran, a number of important patents pertaining to Du Pont Finishes have been granted in these years. Accurately to record this important aspect of research effort, a summary prepared by Cochran is also included in the appendix to this account of finishes' activity over the past 15 years.

Ref. = Chart M

Appendix A, B

SALES DEVELOPMENT LABORATORIES

Mention has previously been made of the Finishes Sales Development Laboratories. Because of the vital importance of the work done by these units, some further detailed information on their activities is warranted.

Technical Sales Development effort in 1947 was still under Research direction. At the Philadelphia laboratory this work was supervised by C. R. E. Merkle who continued in that capacity through 1953. Coincident with the transfer of Sales Technical responsibility from Research to Sales on January 1, 1954, W. D. (Bill) Lawson was designated manager of the Marshall Sales Development Laboratory. When Lawson transferred to a sales position the first of 1957, he was succeeded by J. P. (Jack) McAndrews who occupied this post through 1959. McAndrews was followed by D. L. (Dale) Herndon who continues in that important position.

To gauge the quantitative effort of this laboratory, the following statistics show the number of chemists employed at five year intervals over the period covered by this report:

1947	–	27	(on Sales Development work)
1951	–	48	(" " " ")
1956	–	54	
1961	–	59	

During this span of years, some of the more important projects which have been accomplished at the Marshall Sales Development Laboratory are summarized below by Dale Herndon, present manager of this operation:

"As a sales development laboratory, one of our major responsibilities is to commercialize developments which originated in Research. The following are in this category:

"Budium" – Du Pont's polybutadiene work was started at the Experimental Station after the war and made its first appearance at the old Philadelphia Laboratory in 1948. Once its potentialities as a can coating were recognized, Research was given the responsibility for its development. All through the 1950's,

Sales Development, in the person of J. R. Sackett, helped and guided Research with their program. Sales Development assumed formal responsibility for the beer can base coat in the Fall of 1959 and the topcoat in the Spring of 1961.

Furniture "Dulux" – D "Dulux" as we know it today, got its start in the old Research furniture group about 1950. Sales, in the person of W. F. Schneller, assumed responsibility for its commercialization in 1952. The Bassett Furniture Company started to use D in 1954. Today, Bassett is our most important furniture customer and still uses D "Dulux". An improved version known as E "Dulux" is currently under development.

"Flow Kote" – Styrene butadiene latex interior wall paint was developed by Research in the early 50's and turned over to Sales Development in 1954. Numerous improvements in flow, stability and color uniformity have been made in the past six years. This work was handled by many people under the supervision of K. C. Lampert and R. W. Laurrell. Until the advent of "Lucite" Wall Paint, "Flow Kote" was the biggest single Trade Sales item averaging about 1,000,000 gallons per year from 1953 through 1960.

"Lucite" Wall Paint – This thixotropic acrylic emulsion paint was developed by Research in 1956 and turned over to Sales in 1958. Improvements in odor, scrubability, freeze-thaw resistance and the elimination of seed, made during 1959 by Murray Abriss under the supervision of R. L. Selby, led to the product which is being sold today.

Thermosetting Acrylic Appliance Enamels – Our current "Lucite" 13, 15, 23 and 24 were developed in 1958 and 1959 by J. Vozzella and G. D. LaBarre. These products are based on an acrylic polymer developed by Research during 1957. Although these acrylics currently account for only about 10% of our topcoat business, they are the forerunner of a new versatile chemical family – thermosetting acrylics – that we are sure will find continuing wider acceptance in many of the places where "Dulux" is now sold.

"The following important products were developed exclusively in the Sales Development Laboratory:

Custom-Color System – This term describes the complex system of white bases plus tube and canister colorants which make it possible to obtain over a thousand different colors in any of five Interior Trade Sales qualities and over 50 colors in three Exterior Trade Sales qualities. Many man-years of technical effort have gone into the development and improvement of this system. C. W. Shay, F. T. Johnson, C. W. Secker, O. R. Volk, and K. C. Lampert deserve the major credit for the successful commercialization of this extremely important selling tool.

Grease Resistant Expon Refrigerator Primer – The 828 Line Epon ester refrigerator primers got their start from J. P. McAndrews in 1951. The use of these products eliminated grease as an important source of paint failure on refrigerators. Largely because of their superior grease resistance, Epon ester primers today account for the lion's share of the refrigerator primer business.

New Car Wax – This Specialties item was developed in 1955 by W. A. Hall. It was the first paste wax to combine an abrasive, a wax and silicone so that one product could do the complete job of cleaning, waxing and polishing. It has been an extremely successful item commercially with sales running over $1,000,000 in each of its first five years on the market and has now been widely duplicated by competition.

Polyester Adhesives – These products are based on esters of terephthalic acid and require high vacuum production equipment. They can be formulated to give either thermoplastic or thermosetting products which can be adopted to a wide variety of end uses. The first polyester adhesive was sold in 1956 and sales reached $900,000 in 1961. P. J. Grunwald did much of the development work in the laboratory and later helped the commercialization while a Market Development Specialist in Wilmington."

A similar report on the activities at the Flint Sales Development Laboratory is of equal interest and importance.

As noted in the section on Research, most of the research effort on automotive products was, in 1947, conducted at Parlin. The Flint Laboratory rendered sales support effort to Automotive Manufacturing Sales, however, and when the Parlin Laboratory was consolidated with the Marshall Laboratory at Philadelphia in 1950, Flint remained as the seat of Automotive and Refinish technical sales development effort.

This facility, in 1947, was directed by R. B. (Roy) Davis who was succeeded as Manager in 1950 by J. D. (John) Pickens. The designation of "Flint Sales Development Laboratory", functioning as a unit of the Sales Department, took place in 1954.

Pickens occupied the Manager's post through 1959 when the responsibility was assigned to Jack McAndrews who had been directing the Marshall Sales Development Laboratory. In mid-1961 McAndrews moved into automotive sales work and was followed as Flint Sales Development Laboratory Manager by G. L. (George) Mulholland.

The number of chemists engaged at Flint over the span of this account is here shown:

1947	–	18
1951	–	24
1956	–	29
1961	–	31

Accomplishments of significant importance at the Flint Laboratory are briefly recounted by George Mulholland in the following way:

"Sheet Metal Primer (1949-1950; D. L. Herndon, R. G. Swanson). This was the first sheet metal primer to be developed on an alkyd base, and modifications of it are still in use.

Single Body Undercoat System (1950-1953; D. L. Herndon, C. W. Bullock, A. H. Groth). This involved the development of a single undercoat to replace the two separate component system of primer and surfacer. Gradually we have returned

to the two-component system except the surfacer now is applied wet-on-wet rather than on a baked out primer.

"Dulux 100" (1954-1956; W. K. Moffett, A. N. Walus, L. I. Miller, D. C. Gleason). This involved the development of a highly durable enamel system. Modifications of this original development are still being made.

"Lucite" Acrylic Lacquer (1955-1958; L. W. Crissey, R. J. Sheppard, J. L. Evans, H. W. Godshalk). The basic system was taken in an advanced stage of development from Research Division and developed into a commercial product. Support work in this area has carried to the present time.

"Lucite" Body Undercoats (1955-1956; W. K. Moffett, A. H. Groth). A suitable undercoat for "Lucite" acrylic lacquers was absolutely required and was developed here on a relatively short term basis.

High Gloss Reflow "Lucite" Acrylic Lacquer (1960-1962; L. W. Crissey, J. L. Evans, E. A. Praschan, J. Boles). The concept of sanding and reflowing the product to give a smooth high gloss product originated within General Motors. The product development was carried out at Flint, and this product is being fully commercialized at present.

Universal "Lucite" Acrylic Lacquer (1950-1962; R. E. Pike, R. J. Fulmer). This product is still undergoing commercialization problems and marks the first entirely new system developed for refinish use."

At plant laboratories in all locations, much work is done in behalf of sales effort, ranging from minor product modification to meet specific customer needs to occasional product development work somewhat comparable with effort at Marshall and Flint.

The entire Sales Development technical program has played and continues to occupy a role in Du Pont Finishes history which gives it "star billing". The caliber of this effort has been of high order and the results have contributed importantly to the sales records which mount through the years.

If there is any guidance for the future which may be gained from a study of the past, it might be to further recognize the extreme importance of proper direction of effort for the labors of these scientists. This direction comes only from Sales where the pulse of the market is read or – more importantly – forecast. Seemingly there have been occasions over the years when Sales Technical work was not pointed in directions which offered best opportunities for commercial profit. The vast gulf between foresight and retrospect is realized only too well. With ever-increasing competitive pressures it becomes increasingly necessary, however, to conserve each fraction of technical effort for a profitable result. Hopefully a good record in this respect will be improved still further in the years ahead.

Ref. = Chart M

CONTROL DIVISION

In 1947, the Control Division was under the management of T. L. (Tom) Riggin who had occupied that position since 1935. With Company employment dating to 1913, Tom Riggin had participated in the growth of Du Pont's finishes business from its earliest beginnings. He had successively held positions of responsibility in Finishes Division work at Parlin and Detroit before coming to Wilmington in 1932.

In the course of his career, Riggin had handled a number of special assignments of significant importance. In 1934 when Du Pont acquired Mountain Varnish & Color Works in Toledo, Riggin was made temporary manager of that business. Under his direction, certain assets were liquidated and accounts receivable collected to the point where Du Pont realized about 50% more than the original cost of the acquisition.

In 1947, Riggin was a member of the committee which selected the property which would become the Ft. Madison plant of the Finishes Division and assisted materially in the project work done thereafter to establish this property as an important paint producing facility.

The mission of Control, in Riggin's credo, was to help the department make money. Foremost among ways of making money was saving money. Of all varied responsibilities of the Control Division, therefore, ways and means of saving money got Riggin's first attention.

With volume growing and transportation costs increasing, freight and delivery expenses were a fertile field for savings and special attention was directed toward this area. Excellent results were accomplished from the start in realizing dollar savings on freight charges.

Similarly, attention was given to reduction of finished product inventories in field warehouses. As reported in the Trade Sales section of this account, Trade Sales warehouse stocks alone were reduced 41% from 1951 through 1957.

While the question has already been raised as to the ultimate benefits to the Department of some of these cost saving efforts, the fact remains that the Control Division, under Riggin's direction, prosecuted very successful programs of transportation savings, investment reduction, and clerical personnel reduction which fulfilled the Control Division mission as directed by

Management. It also instituted and supervised stock control procedures for Trade Sales and Refinish warehouses which represented the first application of statistical analysis in an area hitherto operated by trial and error methods. During the period of extensive Paint Store operations, a Stores Control section was maintained which devised procedures for all clerical functions, trained and supervised the clerical personnel and handled all warehouse accounting.

In conducting a business where some $50 million annual volume moved through stores and warehouses to thousands of small customers, control of this portion of business alone was a responsibility of great variety and extreme importance to the Finishes Division. The demands of Sales, Production, Department Management and Corporate policy sometimes conflicted. The penalty for error was great. In such environment, Tom Riggin conducted a smoothly functioning unit which supplied essential accounting services and information, expense and investment control data and performed such special investigative duties as were continually requested by each section within the department. This was done in a period which saw Du Pont's paint business multiply eight-fold over a 25 year span.

Riggin retired in 1958 and R. T. (Ray) Bates succeeded to the Control Manager's position. For 13 years preceding, Bates had served as assistant to Riggin and was well grounded in the operational principles of this office. G. H. (George) Sutton was appointed Assistant Control Manager. Some reorganization of Control functions was carried out coincident with this change.

The present General Accounting Section was established, incorporating into one group what previously were separate Cost and Sales Accounting Sections. The prime reason was greater efficiency and more effective control.

An Expense and Investment Control Section was established, incorporating transportation cost control, warehouse investment control, and statistical analysis into one section to give stronger emphasis to all these areas of control, as well as to provide more adequate supervision for service functions, such as files, mails and stenographic work.

The present Warehouse Accounting Section was established. Essentially no change in functions occurred versus the previous Stores Control Section, except for more definitive areas of activity between this Section and the General Accounting Section.

The present Systems Development Section was formalized, incorporating the operations research group that previously had reported to the Director of Production. The purpose was to correlate all related activities to prevent duplication of effort and, to more effectively pursue systems development work for the Department.

This revised organization of responsibilities has proven to be entirely satisfactory and the unit functions efficiently in behalf of the Department.

Perhaps the most significant change observed in reviewing the period covered by this account is the large extent to which mechanization has come into the picture, performing an ever-broadening variety of tasks formerly done by hand, and doing it so much more accurately and rapidly than in an earlier day. Quite probably, today's procedures will seem equally antiquated 15 years hence.

What will not be considered of lesser value in any future era, however, is the dedication to accuracy and thoroughness which has so splendidly characterized the F. & F. Control Division in the period covered by this chronicle.

ADDED FUNCTIONS

With the increase in volume and complexity of F. & F. business, various staff functions have been added over the years. The more important ones are referred to briefly herein.

Departmental Engineer

In 1948, P. C. (Phil) Olin was appointed Finishes Divisional Engineer. In 1955 his responsibilities were enlarged to include engineering responsibility for all of F. & F. and the position of Departmental Engineer came into being.

All modernization and new project work at F. & F. production facilities is handled under Olin's supervision. With the expansions noted under the Production section of this account, and the continuing effort to make engineering improvements in every operational phase of the department's activities, this position has assumed increasing importance and value.

Personnel Relations Division

In 1952 this unit was organized with J. R. (Ray) Buckley as Manager. With past experience in the Fabrics Division, most recently as Division Manager, Buckley had a good administrative background for this work.

This Division functions in behalf of the Department in the administration of all personnel work and as liaison agency with the corporate Employee Relations Department.

In 1957, R. B. (Bob) Hale was appointed Assistant Manager of this section.

Sales Training

A formalized approach to sales training was first attempted in 1958 with the appointment of J. S. (Joe) Amery as Manager of Sales Training for Finishes personnel. Heretofore carried out to a limited degree by the corporate Employee Relations Department, this departmental unit has made it possible to intensify sales training efforts in behalf of the Finishes field organization, which has long represented the largest sales force in the Company.

In 1959 Amery was succeeded by W. H. (Bill) Reeves, who in turn was replaced in 1961 by J. A. (Pete) McVoy, with C. P. Culp as Assistant Sales Training Manager.

Planning Manager

In keeping with a modern business concept practiced by many organizations – including several Du Pont departments – there was created in 1959 the office of Planning Manager for F.&F. G.T. (Gordon) Vaala, of long experience in Research and Fabrics Division sales work – most recently as Director of Fabrics' Sales – was appointed manager.

Probing areas of special study at Departmental Management request, conducting inter-departmental liaison on matters of common interest, and serving as a focal point for the consolidation and evaluation of needed information in connection with new project effort, this unit contributes a relatively new and unique staff function.

In 1959, G. F. Baldwin was appointed Assistant Manager of the Planning Division.

Market Research

As with the Sales Training function, F. & F. in the past had relied upon corporate facilities for market research effort. Increasing need for services of this nature made it seem advisable to provide a departmental group for more specialized attention to our own problems. In 1959, J. E. (Jay) Mayerberg, with a background of experience in similar work in the Advertising and Development departments, was appointed Manager of Market Research for F. & F.

As the department's interests appear to be trending toward ever widening diversification, and as market intelligence becomes of increasing importance in order to conduct a profitable business, this phase of effort will undoubtedly intensify in the future from the good beginning which has been made.

SELECTED FINISHES RESEARCH DEVELOPMENTS

(1947 – 1961)

INDEX

INDUSTRIAL

ABRASION RESISTANT INDUSTRIAL COATINGS

Development of an abrasion resistant industrial coating (particularly white, for appliances) was motivated by a shortage of tin during the early post-war period, since available organic coatings lacked abrasion resistance as required for refrigerator shelving. In this study it was found that surface active slip agents such as waxes and petroleum jellies were not effective. Fine particle size polyethylene polymer, however, because of its low coefficient of friction, proved to be a solution to the problem when dispersed in the organic coating liquid. Special abrasion tests designed to simulate rubbing of dishes and containers on a refrigerator shelf indicated an abrasion resistant advantage with such modification to be of the order of 300 to 1 in comparison with the conventional coating. This means of obtaining improved abrasion resistance has found commercial application in coatings for refrigerator shelves, metal furniture and industrial clear coatings requiring a high degree of abrasion resistance.

The principle was sufficiently novel to result in patent protection under U.S. Patents 2,518,462 and 2,655,489.

"LUCITE" ACRYLIC APPLIANCE ENAMELS

By early 1957, a demand for enamels of superior properties was rapidly building up in the appliance industry. It was discovered that low cost, high quality enamels could be produced from a terpolymer of styrene/ethyl acrylate/methacrylic acid. In preparing this material the monomers are premixed and added continuously to a high boiling aromatic hydrocarbon solvent with continuous reflux. The resultant low molecular weight terpolymer is compatible with nitrogen resins. At the present time, relatively large volumes of enamels based on blends of this terpolymer with nitrogen resins and castor oil continue to be sold for washer-dryers, refrigerators, freezers, and lamp reflectors.

Various aspects of the "Lucite" appliance enamel development are covered by a series of pending patent applications of which to date one U.S. patent 2,967,162 has issued and another (FDD-1137) stands allowed.

"MYLAR" ADHESIVE

In 1954 need for an adhesive for "Mylar" offered an opportunity as a new market of sizeable proportions. Special requirements, due to the "Mylar" surface, desire for a water white color, and new constructions requiring new levels of adhesives strength indicated that a specially tailored product (in contrast with merely a modified formulation) would be required. Accordingly research was undertaken based on products of the same general chemical family as "Mylar", and eventually involved the synthesis of a number of polyester polymers.

Polymerization work was first carried out by the Research Division at Newburgh where suitable semi-works equipment was available, with evaluation at the Marshall Laboratory in collaboration with the Film Department. From this work products of satisfactory properties were obtained, with several advantages over other adhesives.

Field tests indicated that the usefulness of these compositions would not be confined to "Mylar" structures and other fields such as shoe cements and can seam cements were investigated. Low volume resulted in high cost but commercial sale of this type of product for such uses as vehicles for printing ink, etc., was inaugurated in a semi-works unit installed at Philadelphia. Larger production facilities at Parlin came into operation in the Spring of 1961 and current volume is at a rate indicating annual sales in 1962 in excess of $1MM.

In addition to patent protection provided from Du Pont cases originating with Central Research, Film and Textile Fibers, the following stem from work of F. & F.: U.S. 2,892,747; 2,765,250; 2,765,251 as well as FFD-1165 and FFD-586.

"BUDIUM" (MAC OIL) CAN COATINGS

In the late 1940's Central Research investigated the polymerization of butadiene monomer with boron trifluoride etherate catalyst. Tests showed that thin films of this material would air-dry and provide outstanding inertness. These findings indicated the product might be a good candidate for can coatings, and F. & F. continued investigating this lead.

The polymerization reaction is quite exothermic and is terminated by the addition of a slurry of lime, which forms a complex with the catalyst. The polymer is reduced to 50% solids in a suitable solvent

and filtered to remove gel, lime, and catalyst complex. Small amounts of tetraoctyl titanate and silicone solution are added to provide improved flexibility and flow, respectively.

This homopolymer is low in cost and exhibits outstanding properties as an interior coating for food cans and as a base coating for the interior of beverage cans. However, it has a tendency to impart off-taste to beverages, particularly beer. A copolymer of butadiene/alpha methyl styrene also of relatively low cost, significantly reduces this tendency of off-taste and is undergoing customer evaluation. With the development of a taste-free beverage can topcoat, Sales estimates a potential market of 14MM lbs. solids annually.

Polybutadiene oils prepared by polymerization in the presence of boron trifluoride-etherate are covered by patents issued to Du Pont (U.S. 2,708,639; 2,777,890). Modifications of these homo-polymer oils with titanium esters (especially adapted for interior can use) also are covered by patents issued to Du Pont (U.S. 2,875,919; 2,876,207). Copending F. & F. application (FFD-1147) covers the butadiene/alpha methyl styrene copolymer oil. Esso Research also has been active in this general field, but it is the present opinion that Du Pont has the dominant patent position.

"TEFLON" FINISHES

"Teflon" polytetrafluoroethylene suspensoid became available for commercial development after World War II and F. & F.'s spray and dip finishes based on these suspensoids were developed in the period from 1946-1950. High temperature electrical insulation finishes for wire and for glass cloth laminates were developed first and accounted for the bulk of our business for several years.

Development of suitable primers which gave good adhesion to metal resulted in "Teflon" spray finishes. Commercial exploitation started slowly and the chief customers for many years were custom coaters who supplied "Teflon" coating services on a commercial basis for various applications using expensive ($50 – $110/gallon) finishes. By 1956 the use of "Teflon" spray finishes was well established at about a quarter of a million dollars in annual sales, and gradually expanding.

In early 1961 the appearance of the French T-Fal non-stick frying pan in this country sparked an explosive exploitation of our own "Teflon" finishes in this market. By mid-year our production rate jumped to seven times that of 1960, with some individual orders for more than 1000 gallons, and the demand is

still increasing. Relatively unnoticed due to the magnitude of the above, is a strong growth of "Teflon" finishes in other mass production operations, such as the coating of industrial valves.

In the development of "Teflon" fluorocarbon resin finishes the following important technical developments are listed in chronological order:

1. Concentration of "Teflon" suspensoid (Ikeda) by Electrodecantation.
2. Addition of SiO_2 for promoting adhesion to copper wire. (Ikeda).
3. Wire and laminate coatings involving the development of dip coating techniques. (Sanders).
4. Primer for good adhesion to metals (Osdal) was obtained by emulsifying hydrocarbon solvents and other hydrophobic materials into the "Teflon"/water suspensoids.
5. Improvement in critical mud-cracking thickness, porosity and application properties (Osdal) were obtained by the use of heat-convertible silicone resins.
6. Low baking "Teflon" composition (Osdal) was obtained by the addition of silicone resins and oxidizing acids which, on air-drying, is harder than sintered "Teflon" and retains many useful "Teflon" properties.

Anti-stick "Teflon" coatings have found application in industrial, food, textile, paper, plastics and other processing equipment and also are finding a place in home kitchens. They are used on fountain pens (for "White-glove" filling), in industrial valves (to reduce friction) and as head gaskets in air conditioners (as permanent seals). They are commercially useful as permanent mold-release coatings; and for making a variety of articles such as liquid fuel bags for rockets. (These are made by multiple coat application to metal forms, which are then dissolved chemically.) "Teflon" finishes also are used on cartridge cases for rapid-fire machine guns, on all metal parts of the new NATO M-14 rifle, and their use is reported to eliminate four tons of weight in the equipment carried in a submarine.

Aside from the basic patent covering tetrafluoroethylene polymers, numerous patents have issued to Du Pont covering novel compositions and processes relating to tetrafluoroethylene polymers.

These include:

U.S.	2,592,147	2,681,324
	2,539,329	2,825,706
	2,606,134	2,562,117
	2,562,118	2,613,193
	2,998,332	Application FFD-116

"LECTON" ACRYLIC WIRE ENAMEL

Before the introduction of "Lecton" the most widely used general purpose wire enamel was Formvar (polyvinyl formal). Formvar was deficient in heat aging characteristics and chemical resistance. Disagreeable fumes from cresylic acid solvent evaporation and from solids decomposition were associated with the manufacture of Formvar coated magnet wire. The cost in use was high due to polymer and solvent cost, as well as "stack" loss. Du Pont sold Formvar wire enamels but had no unique position in the industry.

A water-borne wire enamel ("Lecton") based on an emulsion tripolymer of acrylonitrile/butyl acrylate/methacrylic acid was developed and introduced commercially during the 1950's. It is equal to or better than Formvar in substantially all properties. It is far superior in heat aging characteristics and in resistance to "Freon" 22 refrigerant (important in hermetic units). As it is applied from water it is free from obnoxious cresylic acid fumes; and is significantly lower in cost, as used by the customer.

Patents and pending applications, assigned to Du Pont, embraces the "Lecton" acrylic resin enamels and specific processes for their manufacture (U.S. patents 2,787,603; 2,787,561; 2,866,763; also applications FFD-1058 and FFD-1110). The aforementioned type of aqueous emulsion tripolymer compositions is dominated by a patent assigned to Ciba which is licensed on a royalty basis to Du Pont with restrictions as to utilization of the tripolymer compositions. This agreement provides freedom to operate in the electrical insulation field.

ML ELECTRICAL INSULATION

Scouting work in Film Department and Polychemicals Department showed that aromatic dianhydrides such as pyromellitic dianhydride will react with aromatic diamines to produce polyamic acids which are soluble in organic solvents. These can be converted by heat to polyimides which are extremely insoluble and heat resistant. In view of this, F. & F. research was authorized early in 1958 to evaluate aromatic polyimides as finishes and specifically as a Class H wire enamel.

In this program attention was given to (1) selection of the optimum aromatic amine, (2) determination of the optimum solvent blends, and (3) ratio of reactants. Attempts to stabilize the polyamic acid solutions have been only partially successful; and solutions in hot weather or undergoing extended periods of storage, require refrigeration.

The main engineering problem has been associated with mixing of a granular solid with a very viscous solution and this has been solved by a pumping process. A very large part of the project time also was spent in developing optimum conditions for application of the polyamic acid to wire and conversion of polyimide using both lab coating and field work in customers' plants. In this work data were accumulated in support of classifying ML wire enamel as a Super Class H (20,000 hours at 240°C.) material.

About 24,000 gallons of a Class H wire enamel based on ML polyamic acid have been sold during the first half of 1961. A low solids Class H insulating composition and various coated glass fabric constructions have been offered but have not been sold in any volume to date. New uses in other fields are now under study.

Polyamic acids are covered by pending Du Pont patent application (Edwards F-661R) under jurisdiction of Film Department; the polyimide wire enamel is covered by pending application Edwards F-661-A; and pending application Endrey F-661-B relates to heat conversion of polyamic acid compositions to polyimide products.

TRADE

"LUCITE" ACRYLIC HOUSE PAINT

"Lucite" Acrylic House Paint was developed to realize benefits from three inherent advantages of acrylic emulsion polymers:

1. Improved durability resulting from the chemical composition of the acrylic polymer and from the high molecular weight resulting from emulsion polymerization;

2. Moisture blister resistance characteristic of the "breathing" type films laid down from emulsion polymers over an adherent, wood-protective primer;

3. Customer appeal in regard to ease of brushing, ease of cleanup of brushes and other equipment with water, and relative freedom from "painty" odor.

The product was developed originally with a vinyl emulsion vehicle. At present it is made from a purchased acrylic polymer which has somewhat better durability and retention of flexibility. Research and field testing is continuing on acrylic polymers of our own manufacture, with further improved durability properties which result from the improved flexibility retention of newer compositions.

Another new development and companion product which permits fullest benefits from the "Lucite" House Paint is the #49 (alkyd) Blister Resistant Wood Primer. Its development resulted from a study of the causes of moisture blistering of house paint. The alkyd solution vehicle has good adhesion to wood and the critically controlled pigment particle size gives a balanced level of penetration into the wood surface. While some penetration is desired for best mechanical adhesion, excessive loss of vehicle to the substrate (which weakens the primer film) is avoided.

The #49 Primer with the breathing type "Lucite" finish coat gives outstanding blister resistance on new wood or on wood from which previous paint has been removed. Claims have been allowed in a patent application covering the primer and this finishing system. (FFD-1128).

"LUCITE" WALL PAINT

"Lucite" Wall Paint is an extension of earlier water emulsion wall finishes, but with novel features which give it outstanding performance and customer appeal. The earliest alkyd emulsion type wall paint "Speed-Easy" was an outgrowth of original work on emulsion type exterior house paint. "Flow Kote",

made from the more washable, styrene/butadiene polymer, followed. The acrylic vehicle used in the present "Lucite" wall paint gives improved color retention plus an improved balance of scrub resistance and ease of cleaning. Emulsion type finishes have customer appeal because of ease of brushing, ease of cleanup with water and lack of "painty" odor. The "Lucite" finish, however, takes advantage of the "thixotropic" principle. Competitive products have been made at high viscosity to control dripping and splattering, but brushing is difficult. Through the use of a noval combination of methyl cellulose bodying agent plus a finely divided, colloidal clay, the "Lucite" wall paint has a low yield value (decreased viscosity under the high-shear brushing action) with a true "thixotropy" (momentary retention of low viscosity after agitation by brushing). This gives the customer appeal of freedom from dripping and splattering plus the added ease of brushing; and the resulting product has been outstanding in customer acceptance. The technological features embodied in this product do not provide basis for patent protection.

POLYURETHANE PRODUCTS

F. & F.'s interest in isocyanate prepolymers as possible coatings began in early 1954 with Organic Chemicals' "Adiprene" LB and Polyurethane 1126 Liquid Prepolymers. These prepolymers cured by reaction, with moisture, to give tough abrasion resistant coatings. Late in 1954 promising results of Orchem were confirmed in panel tests at the Marshall Laboratory. The coatings showed excellent hardness, flexibility, impact resistance, solvent resistance, gloss and cure rate.

"Adiprene" prepolymers contain free isocyanate end groups that air-cure by reaction with moisture. By controlling proportions of the hydroxyl material used for prepolymer synthesis and the amount of toluene diisocyanate, an extremely wide variety of physical properties can be achieved in the cured films, from soft elastomers to very hard brittle polymers.

Several new products were based on a prepolymer vehicle derived from low-cost polypropylene ether glycol, trimethylol propane and toluene diisocyanate. The first product was a floor finish which still is unequalled as a superior abrasion resistant, fast-drying properties. It is suitable for all types of wooden floors and has been extensively used as a floor finish in southern textile mills. Slight reformulations of the basic vehicle also has resulted in a superior abrasion resistant finish for hopper cars, designed to transport food products and chemicals.

CHART H

REFINISH SALES

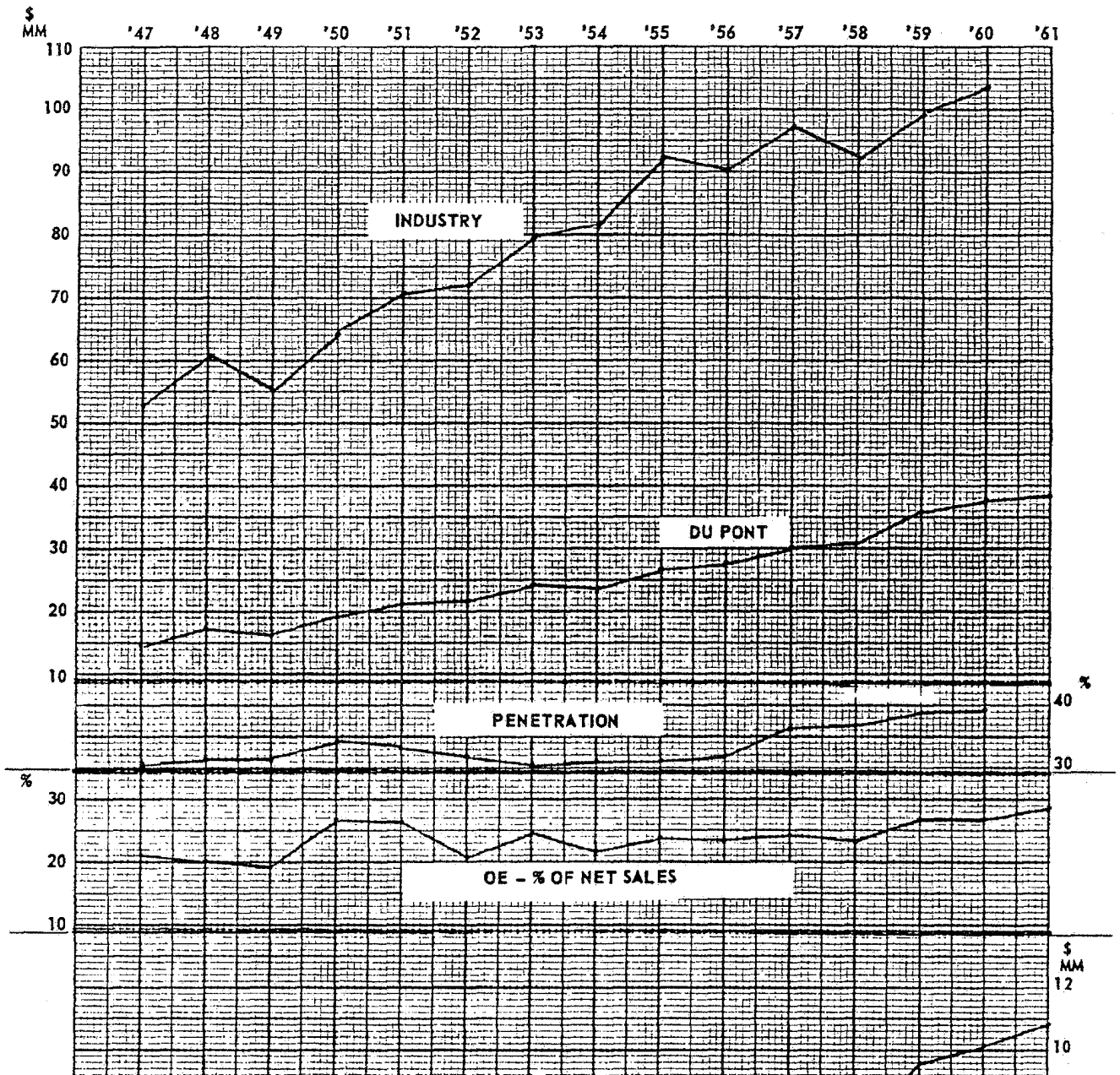


CHART I

CHEMICAL SPECIALTIES SALES

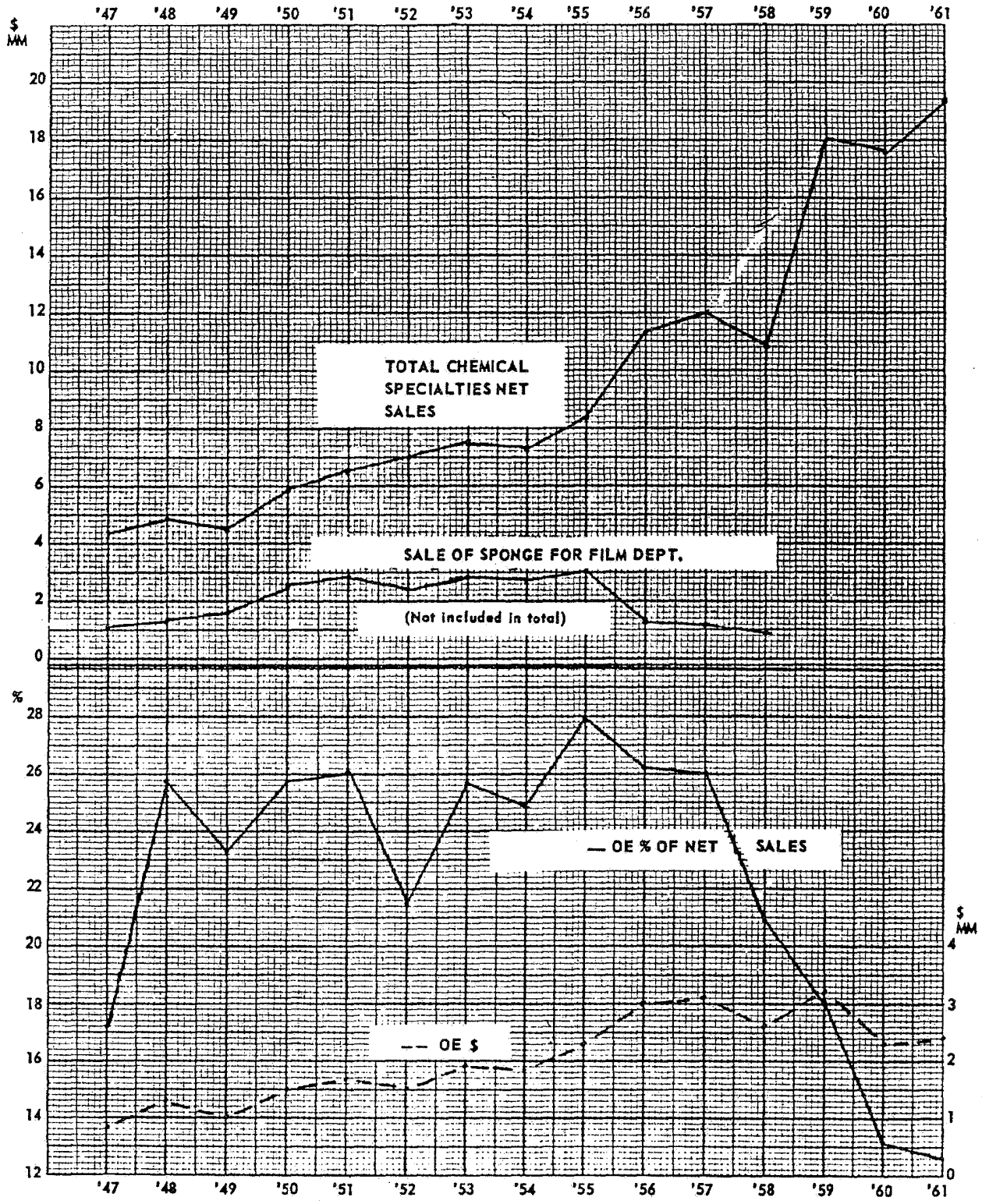


CHART J

MEMO CHART – CHEMICAL SPECIALTIES

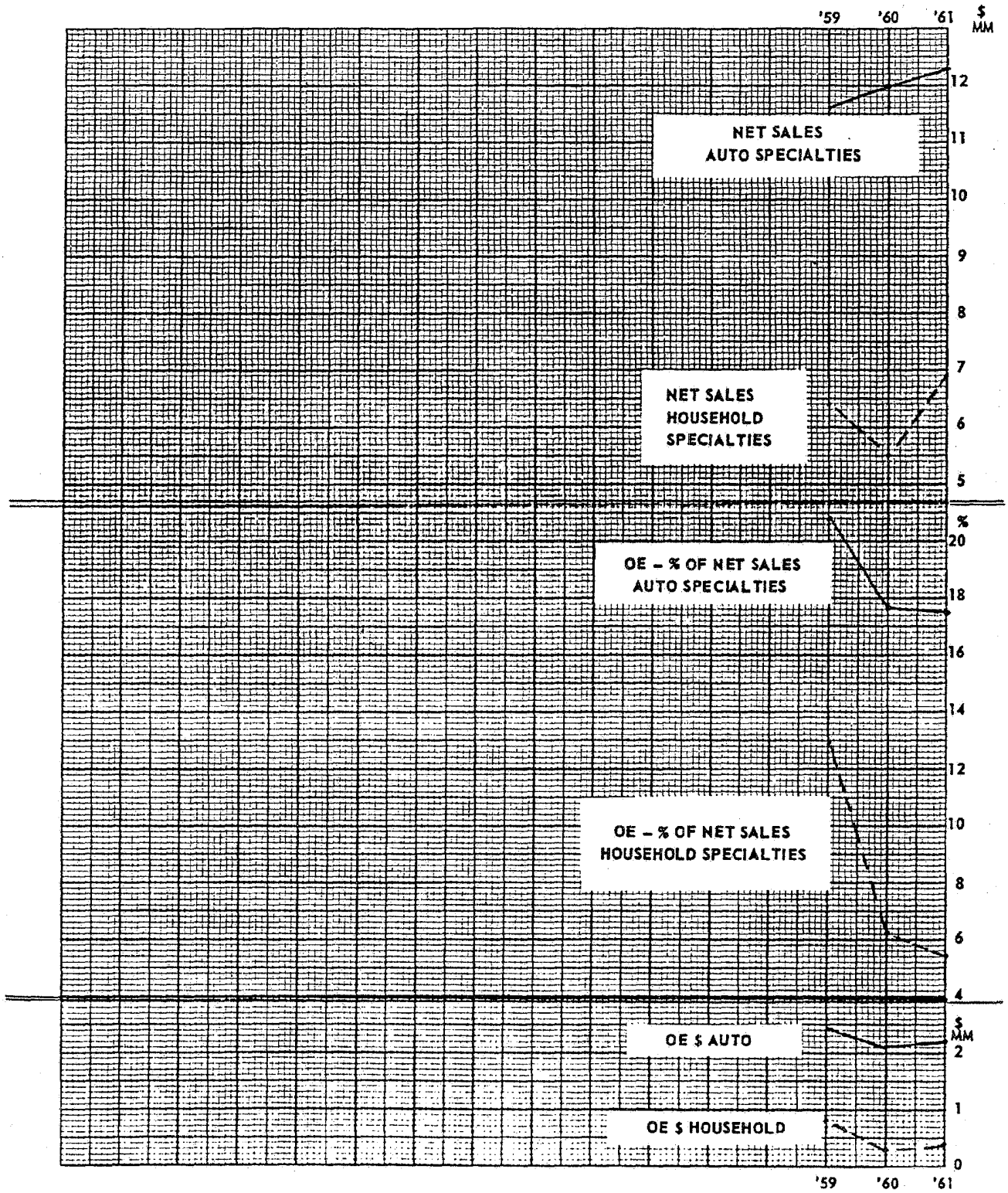


CHART K

EXPORT SALES

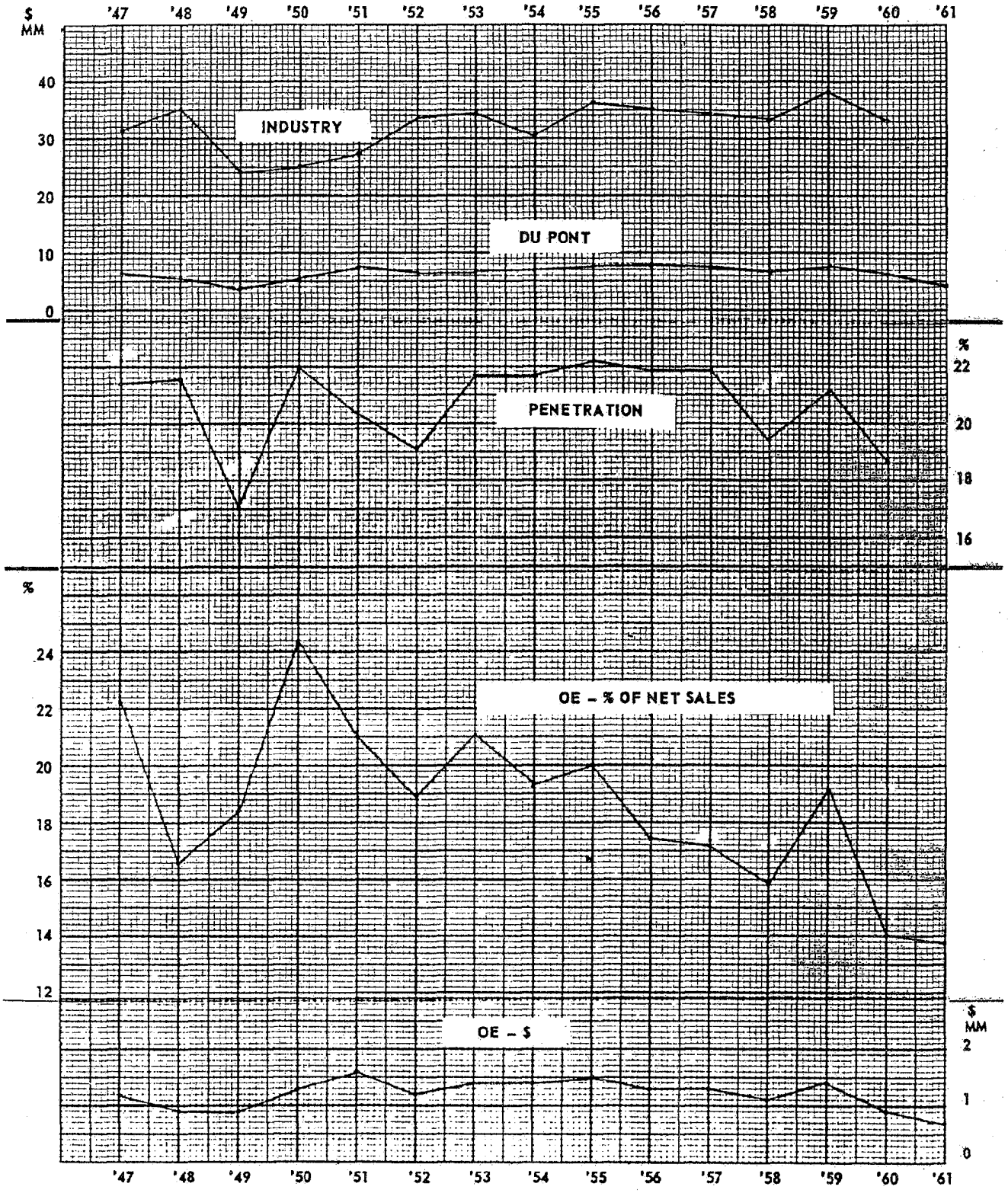


CHART L

TRANSFERS (DOMESTIC)

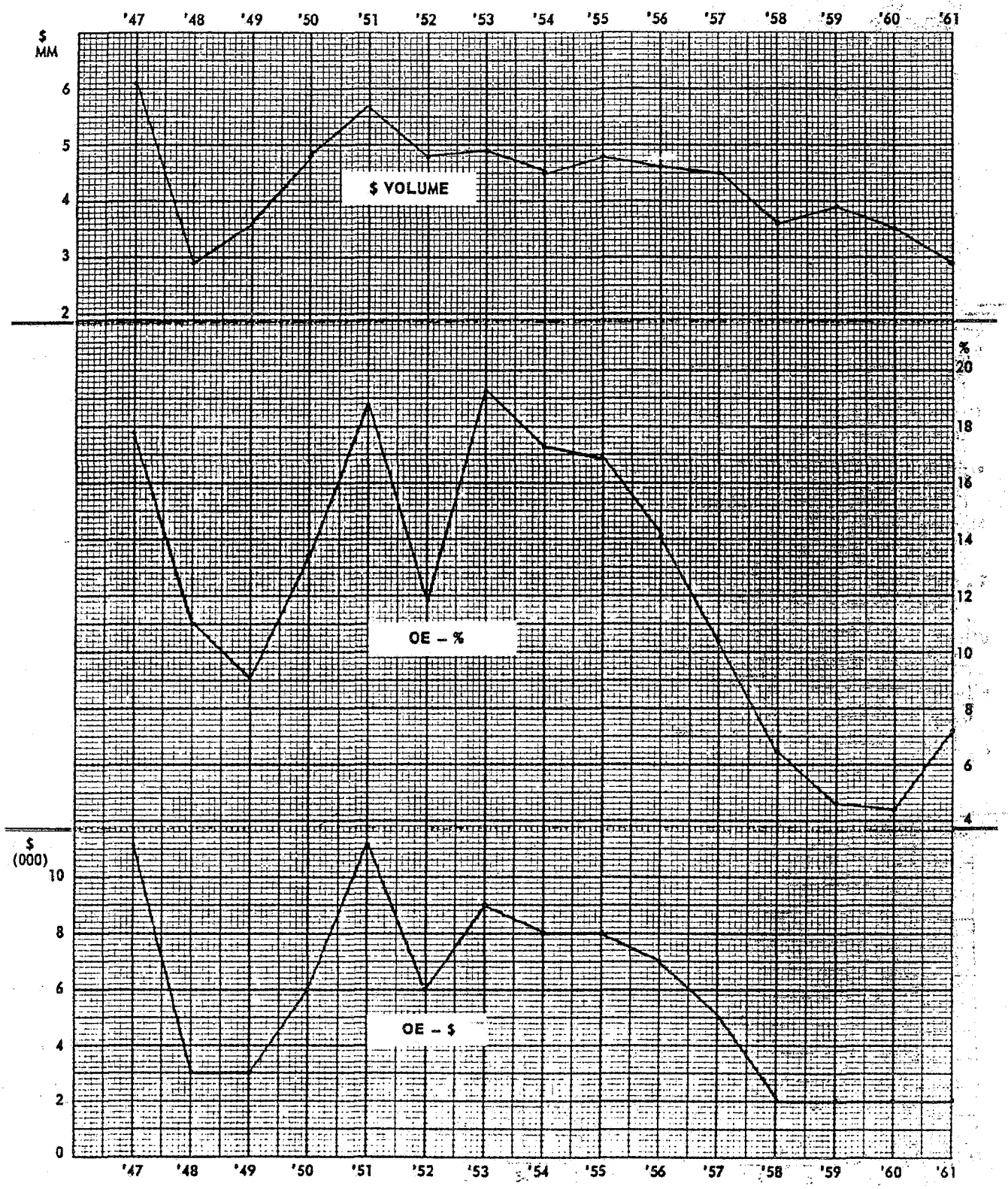


CHART M

FINISHES TECHNICAL EXPENDITURES