

**HARRISON BROTHERS AND DUPONT
IN PHILADELPHIA**

**Presented by C. R. E. Merkle
in connection with the showing of**

**"DUPONT STORY"
By the Public Relations Department**

for the

CITY HISTORY SOCIETY OF PHILADELPHIA

at

**THE KLAHR AUDITORIUM
HAHNEMANN MEDICAL COLLEGE
227 North Fifteenth Street
Philadelphia, Pennsylvania**

April 21, 1953

N50755

LMH 0010144

110123577

HARRISON BROTHERS AND DU PONT IN PHILADELPHIA

Tonight we will review briefly the history of two great companies - Harrison Brothers, founded in 1793, and Du Pont, founded in 1802. In both cases the founders were pioneers in their respective fields, started from very modest beginnings, and in spite of many trials and tribulations their companies grew to importance in size and influence with the growth of our country.

I will discuss the early history of Harrison Brothers and the period of my employment with both Harrison and Du Pont, but a more interesting and complete story on Du Pont will follow my talk. I have been asked to do this primarily because of a long service with the two companies, and while I have personal knowledge of much that transpired from 1904, I have had to look up some of the historical references of the early history of Harrison Brothers and its founder, John Harrison.

John Harrison was born in Philadelphia on December 17, 1773, the son of Thomas, who came to America from England in 1764, and Sarah Richards Harrison, who was a prominent member of the Society of Friends. John Harrison was educated in Philadelphia and for a time was apprenticed to a local druggist. Later, he went to Europe to study the business of manufacture of chemicals including the study of the science of chemistry under the celebrated Dr. Joseph Priestly.

In 1793 he established a wholesale and retail trade in chemicals and drugs. He was firmly impressed with the belief that many of the materials imported into the United States could be manufactured here. It is interesting here to note a parallel with the experience of E. I. du Pont de Nemours, who founded this company because of his conviction that gunpowder equal to the best imported grade could be made in the United States. John Harrison's first manufacturing venture was that of sulfuric acid in a small installation that could produce only about 1 carboy a day. Other acids and chemicals were added to his manufacturing efforts to supply the needs of his wholesale and retail chemical and drug business. Historically, however, it is important to remember that John Harrison was the first manufacturer in the United States of sulfuric acid, the most important chemical in industry.

Harrison's early start, history tells us, was on Green Street west of Third. Later, he moved to a location further out from the center of the city in what is known today as Kensington where he had more space for his enlarged manufacturing operations. In 1806, it is reported that he produced white lead, the principal pigment for painting at that time, and while there is some question as to whether Harrison or some other producer pioneered the manufacture of this important product in the United States, it was nevertheless an outstanding achievement for this early period.

LMH 0010145

DUP110133578

In 1807, we learned that he built a lead chamber 50' long, 18' wide and 18' high for the manufacture of sulfuric acid which was a large plant for this period, and produced 1/2 million pounds of sulfuric acid annually. This, it seems, fully established him as an important manufacturer of heavy chemicals in those early days.

As a point of further interest, John Harrison was the first one at least in this country to use the precious metal platinum in an industrial operation. It was in 1814 that he had a platinum still made for concentrating sulfuric acid to oil of vitriol. He did this to replace the glass vessels he had been using because the latter were hazardous and costly due to frequent breakage. This platinum still which had a capacity of 25 gallons and contained 700 ounces of platinum was in use for over 15 years.

John Harrison in addition to being a pioneer in chemical manufacture found time for various civic activities, as captain of the Philadelphia Militia, Recorder of the City and County of Philadelphia and as a member of the first Board of Managers of Franklin Institute, to name a few of them. Furthermore, he was the father of eight children which undoubtedly helped to make the name of Harrison an important one to Philadelphia.

The Harrison business continued to grow and prosper and in 1831 when John Harrison admitted two of his sons into partnership the company became known as John Harrison & Sons. Two years later when John Harrison died, the company name became Harrison Brothers. It was again changed to Harrison Bros. & Co. in 1859 when three of the grandsons were admitted into the business.

Another grandson, Charles Custis Harrison, became provost of the University of Pennsylvania. It was in 1892 that the Harrison family helped finance the establishment of the John Harrison Chemical Laboratory at the University of Pennsylvania, contributing about one-half the cost of the building and equipment, in honor of their grandfather. A bronze statue of John Harrison is located alongside the laboratory building.

Upon the death of Thomas S. Harrison, one of the grandsons of John Harrison and a previous partner in the business, he established two trust funds; the smaller of these - a fund of \$20,000, is administered by the Board of City Trusts. A larger fund, which now amounts to \$630,000, was established to promote good government in Philadelphia and the income from this fund is administered by the Thomas Skelton Harrison Foundation.

While Harrison Bros. & Co. continued to operate the Kensington plant until 1872, it was in 1863 that they started operations at its final site, a 30-acre plot located on Grays Ferry Road from 34th to 36th Streets, extending to the Schuylkill River where the ferry across the river was located.

LMH 0010146

DUP110133579

The first Grays Ferry bridge was a wooden covered one and was not replaced until 1898 with the present structure. It was probably the last of the covered bridges within the city limits, and I recall crossing it a number of times in my youth.

It was on October 1, 1904 that I joined Harrison Bros. & Co., encouraged by a family friend, who was in charge of the operation, to learn the business of alum manufacture. I soon learned that Harrison Bros. was a rather diversified and somewhat integrated manufacturer of all types of acids and related heavy chemicals and even had their own bauxite mines as a source of aluminum for the production of alum.

In addition, they had an important paint business and manufactured a full line of consumer products and some industrial finishes. The intermediates for paints that were manufactured for their own use and for sale included varnishes and such pigments as white lead, lithopone, and dry colors. Early in my work with the company I was assigned to the paint end of the business and have followed it ever since.

It may be of interest to touch briefly the matter of living conditions in 1904. The standard of living was very much lower, and was probably much closer to the living conditions existing in Europe at that time. There was not the slightest resemblance to the abundant living conditions enjoyed in our country today. Twenty-five years ago during a European trip for the DuPont Company visiting seven countries, I had an opportunity to observe the difference in living conditions at that time.

In 1904 at Harrison's, while supervision and some of the more important mechanical functions were entrusted to Americans, most of the common labor was of foreign extraction, Italian predominating. The rates for common labor were very low, about 9¢ an hour and the work week was from 55 to 60 hours. At the lunch period most of the laborers could be seen sitting down with a loaf of bread, a piece of fat bacon, an onion or garlic and water for drink. There were no lunch rooms or hot food available in those days and they ate where they could find a place to sit.

The cost of living, naturally, was much lower and the nickel had some potent purchasing power; for example, a trolley ride; a loaf of bread; a good cigar; and a large size glass of beer, the latter often with free lunch. A pound of pork chops could be purchased at from 10¢ to 12¢ and a pound of sirloin steak or coffee at 20¢. The National Budget at that time was only about \$580,000,000 - less than 1% of our present budget. Of course, there was no personal income tax until years later.

Harrison Bros. & Co. had incorporated in 1898 and while the Harrison family continued their activity for 4 or 5 years,

LMH 0010147

DUP110133580

they finally retired from it. The new corporation probably had some financial difficulties in its early days and a banking firm, the Lee Higginson Company of Boston, was represented on the Board of Directors. It was through them, in about 1902, that they installed Mr. R. S. Perry, a chemical engineer, as president and later Mr. R. S. Hubbard, a banker (Mr. Perry's brother-in-law) as vice-president and treasurer. These two men were a good team because Mr. Hubbard's conservatism was a good balance for Mr. Perry's sometimes over-enthusiastic energy in handling the affairs of the company. Mr. Perry not only looked like Theodore Roosevelt but seemed to be inspired by many of his enthusiastic and energetic mannerisms. Mr. Perry, I am happy to say, made some outstanding contributions during his regime that give him an important place in the paint industry history.

The painting of houses for many years was done with White Lead in Oil thinned with linseed oil by the painter or consumer. Harrison had a large stake in the white lead business but along with the paint industry started producing so-called "ready-mixed paints". Unfortunately, some producers gave this innovation a black eye by taking advantage of the opportunity to compound inferior materials, replacing lead and zinc pigments with excessive amounts of low cost extender pigment and replacing linseed oil with water emulsions. In view of this, in order to enable the ready-mixed paint business to survive, it was necessary for the industry to take corrective steps in the form of an educational campaign for paint consumers and the labeling of paint containers to show their composition. Mr. Perry and Harrison Brothers took an active part in the campaign, cooperating with the National Paint Manufacturers Association in educational advertising, the use of label analysis on packages, and assisting various states to establish equitable labeling laws.

The period from 1904 to 1917 was of course before the era of research and chemical development in the paint industry or in industry generally. It had been largely an empirical art and it was Perry who had the vision that the industry should do something to advance it technically and chemically. As a result of this initiative, the Scientific Section of the Paint Manufacturers Association was organized and started operation at the Harrison Plant at Grays Ferry in 1907. The Scientific Section stayed on at the Harrison Plant for a number of years before moving to the National Paint, Varnish & Lacquer Assn. headquarters at Washington, where it is still functioning. While at Grays Ferry they started the first industry study of rust inhibitive pigments and arranged for the erection of the exposure test fences located in Atlantic City in 1909 for the study of metal protective primers. This was the beginning of an effort to make the paint industry more scientific; however, the more important advancements had to come from industry itself years later.

LMH 0010148

DUP110133581

Harrison Brothers were also among early companies to establish medical dispensaries in industrial plants. This was brought about by the late Dr. Francis D. Patterson, who came to Harrison in 1912 and organized such a function at Grays Ferry for the protection and safety of its employees. Dr. Patterson was particularly interested in combating lead poisoning among the workers in the lead manufacturing industries and became one of the country's top-flight specialists in this field. While with Harrison, he was also Chief of the Division of Industrial Hygiene of the Department of Labor and Industry in Pennsylvania, and helped in the establishment of the State's labor laws for the protection of the factory worker.

The Harrison Plant at Grays Ferry while large for its day was nevertheless small enough so that its employees were quite well known to each other and got along agreeably as one big family. While the Company felt the impact of business recessions at times, it weathered the storms and each year made progress in the expansion of its business. When World War I came in 1914, operations in the heavy chemicals branch of the business increased tremendously, particularly the manufacture of sulfuric, nitric and mixed acids. At this time, an additional plant for the manufacture of acids was established at Paulsboro, N. J. One of our biggest customers was the Du Pont Company. Finally, in 1917, we heard that the Du Pont Company had purchased the Harrison Brothers business after 124 years of existence.

It was assumed by many of us that the purchase of the Company was to provide increased capacity for acids and chemicals for their own use as a defense measure. However, there was also a paint business and it was soon apparent that Du Pont was also interested in it as a means of diversifying its activities. In quick succession in 1918, the Du Pont Company purchased the Bridgeport Wood Finishing Company in Connecticut, the New England Oil Paint and Varnish Company in Massachusetts and the Flint Varnish & Color Works in Flint, Michigan and Toronto, Ontario. In 1920, the Chicago Varnish works was also purchased. It was in December 1918 that I went to the Flint plant for a 10-year period, serving as technical supervisor and finally as plant manager and in the meantime had a lot to do with the assimilation of the technical information and formulas of these newly acquired companies.

The coordination of these new plants and their sales forces along with the DuPont lacquer business conducted from the Parlin, N. J. plant required a number of years of organization and consolidation. Meanwhile, it was obvious that the DuPont Company was not satisfied with the technical status of the protective coatings field and, therefore, put its chemical staff to work conducting research work for improved materials in traditional Du Pont fashion.

LMH 0010149

DUP110133582

The first fruits of this effort were realized in 1922 and 1923 when the DuPont Company announced the development of Spray "Duco" Nitrocellulose Lacquer, a finish that found wide industrial use. While nitrocellulose lacquers had previously been available, they were of such low solids and poor application properties that they found rather limited use.

"Duco" was grasped eagerly by the automotive industry because it solved two of its most difficult problems. Its quick drying properties enabled automobile manufacturers to apply colored coats to an automobile that took only a few hours to dry as compared with the carriage finishes previously used that took several weeks to process. Furthermore, the old slow drying carriage finishes were not very durable and would often check and disintegrate after the first summer's exposure. "Duco" provided a finish of beauty that has most often lasted for the life of an automobile.

"Duco" Lacquers were followed as a result of the Company's research by the development in 1928 of "Dulux" enamels, based on glyceryl phthalate and a new type of synthetic chemistry for the paint industry. This development has done more to revolutionize the protective coatings industry than anything previously developed or since because of its wide application. "Dulux" soon found its place in all types of industrial and consumer finishes. It was the basis for the first satisfactory organic white finish for refrigerators and other household appliances and is still being used. "Dulux" supplemented "Duco" in the automotive and railway and aviation fields and is giving outstanding performance as a marine finish, as a protective coating for maintenance and in finishes for use in the home.

There have been many changes at Grays Ferry since 1904 and 1917. Many of the old operations have been either closed down or transferred to other locations to make room for the new modern structures for the manufacture of paints and related finishes. However, you may still see the name "Harrison" on the powerhouse stack. Grays Ferry is now among the larger producing units in the paint industry. Its output has an annual value of roughly 25 to 30,000,000 dollars and is the largest of eight producing plants in our Finishes Division. It is also the site of the relatively new Marshall Laboratory, probably the largest and best equipped research laboratory in the organic finish field. It provides facilities for about 150 chemists, physicists and engineers and approximately an equal number of other workers dedicated to the improvement of organic finishes in all fields of their use.

Earlier I mentioned the higher standards of living in our country today. This advance in living standards has come about because industry has invested heavily in new equipment,

LMH 0010150

DUP110133583

the fine particles with controlled additions of acetic and carbonic acids. This allows the reduction of the time required for complete conversion from 120 days to 8 days. The process is continuous, which also is advantageous. Those manufacturers who did not convert to the new process had little good to say about it: "It is well established that the more slowly the lead is corroded, the better the body of the white lead" (1898 Anonymous 12).

The toxicity associated with white lead has always been recognized, but until better pigments were developed, its superior quality kept it an important item of commerce. Today very little is being used and those buildings that still have large quantities of lead containing paints on their walls are being stripped thereof, whenever possible.

The history of the development of the white lead industry again shows the interaction between the manufacturers and the academic scientists. Each benefits from the work and thought of the other, often over substantial time and distance, thanks to the customs of publishing results in technical and scientific journals. The granting of patents in return for the teaching of new information often stirs the imagination of others, leading to new developments, new ideas, new facts and explorations. The result is the magnificent edifice we today call science and technology. For all our doubts, for all our fears, very few of us are ready to abandon its walls for a return to the terror, the ignorance and the miseries of a few centuries ago.

Entrepreneurs like John Harrison were a vital part of this process. He and his contemporaries in Philadelphia made this city the birthplace of the American chemical industry. Their contributions in the form of experiments and "hands on" knowledge were an essential requirement, which provided the university scientists with much of the data they used to develop their theories. They were also the

LMH 0010183

DUP110133616

- 7 -

new processes, and research, which have made it possible for each employee to produce more goods in less time. When each man produces more goods, each man's work is worth more in the terms of the goods it can buy. We have seen this progress at Grays Ferry Road, where we now have production equipment and research facilities on a scale unheard of at the beginning of the century.

The Du Pont Finishes Division of which I have spoken is part of the Fabrics & Finishes Department, one of 10 different manufacturing departments of the Company. Each of these represents big business in its respective field. By far, the greatest growth of the Du Pont Company has stemmed from its research work. The success of Du Pont research is reflected in the large number of new products brought to the market in the past 25 years, which currently account for more than half of product sales. You will understand this better from the story that will be unfolded in the film you are about to see and should make clear to you that Du Pont has dedicated its efforts to "Better Things for Better Living Through Chemistry".

CREM:RGD
4/21/53

LMH 0010151

DUP110133584