HISTORY OF THE INSULATION INDUSTRY

Presented by J. H. Layton, Jr., Pittsburgh Corning Corporation, at the meeting of the Thermal Insulation Society Meeting, held in Williamsburg, Va., Nov. 1, 1956

ASBESTOS

In the early days when temperatures and pressures were low, coal cheap and plentiful, any old thing was used to cover the pipes. In one steamboat installation, for instance, it was found very economical to use the old carpet from the saloon, which, at that very time, was being replaced by a new Brussels one and the old one, when used for pipe covering, was therefore so much salvage. This was in 1858. Other mixtures were: clay and cattle hair or other binding material; fire clay, charcoal and sawdust, ground fine, mixed with water, and cattle hair for a binder; hair felt was used extensively and one of the favorite binders was cattails.

For boilers, plastic materials were used as early as 1865, but asbestos was not known in the business. One of the first installations of cement covering consisted of a layer of plaster of Paris, covered with chicken wire, then a layer of fire clay held in place with chicken wire, the finishing being done with sand and plaster of Paris.

The indifference with which pipes were covered or left uncovered was traceable, of course, to the fact that the pressures were too low to prove troublesome, and also because little attention was paid to the conservation of heat or the saving of coal in those early days. In fact, it was considered more important to keep the heat out of the engine room than in the pipes. Appearance was also more important than either the conserving of cool or heat, if we are to believe the story told of the salesman who approached a quite noted engineer in New York and endeavored to sell him covering for the pipes of a fairly large job. "Why should we cover the pipes," said the engineer, "they are very nicely painted."

The first insulation containing asbestos was used in 1866, in a material made by Robert F. Toope and consisted of asbestos fibre and silicate of soda. Curiously enough this same insulation was also the first sectional insulation material to be made. Mr. Toope's place of business was on E. 79th Street, New York City, and he sold his patent rights in the United States to the Johns Company (now Johns-Manville).

The first asbestos cement for use on boilers was tried about 1870, and contained 15% of asbestos fibre. It was made by the Chalmers-Spence Company at the foot of E. 9th Street, New York City. Magnesia Sectional Covering appeared in 1885 while the first asbestos aircell covering was produced in Brooklyn in 1898.

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The discovery of the heat insulating properties of magnesia carbonate is credited to Hiram N. Hanmore, who had been in the pipe covering business for many years in a minor way. He was troubled with what the doctors then called a sour stomach and was recommended to carry with him a little piece of Carbonate of Magnesia and eat a small piece of it when he felt that his stomach was out of order. One night while sitting in a bar room in the coal mining region of Pennsylvania where he had a big job on hand, he took the Magnesia from his pocket and while toying with it suddenly realized its lightness, indicating to him that it might make a good non-conductor of heat. He walked over to the stove, which was very hot, and laid the piect of magnesia on the top. At the end of ten minutes he picked it up and finding it was practically cool, remarked "This is going to revolutionize the pipe covering business." Some tell the story differently, but there is little doubt that Hanmore got the idea of its insulating qualities from the very light weight in proportion to the bulk of Magnesia Carbonate, and there is no doubt at all that his discovery did revolutionize the insulation business.

Hanmore found that the Keasbey & Mattison Company made Carbonate of Magnesia, and bought a quantity in order to experiment with it as a substitute for the plaster of Paris he was then using in his cement. His first patent covered a non-heat-conducting covering made of Magnesia and shredded rope. He found it very hard work, however, to chop up the second hand ship's rope, and also a very slow process. At that time he did not use enough of it to warrant putting in a machine to chew up the rope. So he tried out silk noils, and found that these gave the mixture more strength than the rope.

About this time someone told Dr. Mattison of the large orders for Carbonate of Magnesia coming from Mr. Hanmore. When one of Mr. Hanmore's workmen drove up to the Keasbey & Mattison Company's plant and asked for 1000 pounds of Magnesia Carbonate, the shipping clerk was astounded as the largest orders previously had been for a keg containing 30 pounds or sometimes a barrel of 60 pounds, but since the man had the cash to pay for it, the men in the shipping department got busy and packed up as much as they had on hand which was about 500 pounds. Mr. Hanmore's man said he would call the next day for the balance. When he came back he said that he needed five tons. The shipping clerk could hardly believe that he had heard correctly. "Do you know how much a ton of this stuff is?" he demanded. "Why you couldn't begin to get it in your wagon." The man said he did know and would make several trips to get the full amount, which he did, paying cash each time. The clerk finally asked him what in the world he was doing with the stuff, and was told that Mr. Hanmore had patented the idea of using carbonate of magnesia as a pipe covering

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This being a new idea it was promptly brought to the attention of Dr. Mattison with the final result that an arrangement was made with Mr. Hanmers for the manufacture of the covering.

At that time the magnesia mixed with silk noils was simply put on the pipe in a plastic form but shortly afterwards, Dr. Mattison took over the manufacture of the material, formed the Magnesia Sectional Covering Company and moulds were made for forming the mass into sections and block. Dr. Mattison, who had long been interested in asbestos as a mineral, suggested the use of the asbestos fibre instead of silk noils because the asbestos was fire-proof, but it is not certain just when the change from silk noils to asbestos was made. (Noils--waste silk produced in the production of spun silk.)

The present Johns-Manville Corporation traces its origin to 1858 when H. W. Johns, roofing manufacturer and founder of the asbestos industry, started out as a jobber and manufacturer in a small basement shop at 78 Williams Street, New York City, under the name of the H. W. Johns Manufacturing Company.

His first business was the production of a roofing made from rag felt and coal tar, together with paints and coatings for roofs and for preserving wood, metals and fabrics.

In 1868 the H. W. Johns Manufacturing Company first made known the results of long and continued research and experiment with asbestos fibres, and began the manufacture of numerous products composed wholly or in part of asbestos fibres, many of which came to be recognized as standard articles for mechanical, structural and electrical uses.

By 1886, there were four departments in the company: Paints, Roofing, Insulations, and Asbestos Fiberizing and Textiles.

While Mr. Johns was carrying on his experiments with asbestos, Charles B. Manville and his three sons were pioneering in other industrial fields and in 1886 they founded the Manville Covering Company in Milwaukee, Wis. The early days of the Manville Company were largely occupied in determining the best materials for covering boilers and steam pipes. Mixtures of paper pulp and blue clay, common in the vicinity of Milwaukee, were tried successfully. Later, wool felt shoddy was used as a binder in the clay, instead of paper pulp, and failure from contraction and expansion of the metal surfaces as well as loss of temperature was considerably lessened.
(Shoddy--reclaimed wool.)

Since production methods in industry were rapidly changing, corresponding demand for higher temperature insulations resulted. This led to an arrangement by which the Manville Covering Company took over the H. W. Johns Manufacturing Company branch in Chicago, handling the rapidly developing asbestos products for high temperature insulations.

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Mr. Johns died in 1898 and three years later, in 1901, the Manville Covering Company of Milwaukee, in business since 1886, was merged with the H. W. Johns Manufacturing Company of New York, taking the firm name of H. W. Johns-Manville Company.

From the H. W. Johns-Manville Company the present Johns-Manville Corporation inherited the line of insulating cements, asbestos and asphalt roofings, asbestos paper, high and low temperature insulations and other specialties.

When T. F. Manville, President, died in 1925, the company began a transition from limited to widespread public ownership, and in 1927 became known as Johns-Manville Corporation.

MINERAL WOOL

Mineral wool was first produced by Nature during an eruption of the volcano of Kilauea, which, native Hawaiian legend explained, was the goddess, Pele, holding court. After the crater had cooled, natives would venture up the mountain and collect strands of a wool-like substance which they reverenced as "Pele's Hair", thought to have been torn out by the goddess in a rage.

Geological survey revealed this substance to be lava, blown into soft threads by the gigantic forces of the volcano.

Mineral wool from blast furnace slag is supposed to have been in commercial production in Wales in 1840 and in Germany as early as 1870. Here in the United States production started in 1897. As far as the United States is concerned, experimental work was carried on several years before this commercial production date.

A patent issued August 21, 1877, describes the fabrication of bonded products from bulk mineral wool using a bituminous binder. This patent might be considered the forerunner of current batt and felt production as we know it today.

A patent issued August 7, 1883, describes a thermal insulating cement composed of mineral wool, clay to give binding action and the addition of animal hair.

Mineral wool insulation in block form was first described in a patent issued July 10, 1888. These blocks were made from mineral wool fiber that was dispersed in water and formed in a filter mold to remove the water, followed by a drying of the wet block.

Mr. Charles C. Hall, founder of the commercial Rock Wool industry moved to Alexandria, Indiana, in 1895 from Belleville, Illinois, to become Superintendent of Construction of a small steel plant then being built in Alexandria.

The steel plant was completed and ready for operation in the fall of 1896, but never operated because it was merged with other steel interests to form the original Republic Steel Company.

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