White Lead—A Yardstick for Paint

THE recommendations of those who have had much experience with paint—manufacturers as well as users—are of the utmost value as a guide in purchasing this highly specialized product. What kind of paint, for example, for outside application does the manufacturer of high quality paint sell? Similarly, what kind of paint does the United States Government purchase? What paints do State Highway Departments use? What paints do architects recommend? What do master painters use on their own homes? Readers of LEAD who have followed the data presented in these pages from issue to issue know the answer to several of these questions but the conclusions bear repetition and for convenience are summarized below:

PAINTING RECOMMENDATIONS AND PRACTICES

OUTSIDE PAINT

United States Government	Requires either (a) 100% white lead in oil or (b) Minimum 60% white lead in prepared paint.
State Highway Commissions	On Timber Construction. Both white lead and prepared paints used. Average white lead content of prepared paint 68%.
Architects	68% specify pure white lead; 32% specify prepared paints which average over 60% white lead.
Master Painters	85% of master painters paint their *own* homes with pure white lead.

To this table should be added the kind of paint produced by representative manufacturers of high grade outside paints in the United States. Therefore, we list below a table showing the white lead content of high-grade outside paints made by 19 well known paint manufacturers:

WHITE LEAD CONTENT OF SOME HIGH GRADE PREPARED PAINTS

(In Per Cent)

57	61	60	60
45	54	50	60
61	55	75	45
50	55	50	60
41	60	50	

Inspection of this table shows that the white lead content ranges from 41 per cent to 75 per cent, with an average of 55.5 per cent. This result is not far from the United States Government requirements of at least 60 per cent white lead in prepared paints.

Broadly speaking, there are two classes of high grade outside paints available in the United States:

1. pure white lead in oil and
2. prepared paints made from several pigments, including a large percentage of white lead.

Class 1 paint is of uniformly high quality, with an unexcelled reputation for durability and economy that extends deep into the past and has made the term "White Lead" synonymous with the best in paint.

Prepared paints are produced in various combinations and qualities. Ordinarily it is not so easy for the layman to identify the highest grades. Is there any measure which the buyer can use to help him in selecting his paints? Fortunately a simple yardstick is available, even though it has, admittedly, certain shortcomings. This measure depends, as we have indicated, upon the demonstrable fact that the highest quality prepared paints, of reputable manufacturers, contain substantial amounts of white lead.

A master painter's own home in Westfield, N. J., painted with pure white lead in 1929 and photographed more than five years later.

Although it is conceivable that a paint may be ruined by a poor oil or other added ingredients despite a high lead content, the fact remains that paint purchasers possess a rough yardstick of the quality of the paint by the amount of white lead which it contains. In the absence of any other test this measure becomes especially useful in appraising the worth of a paint, where little is known about the manufacturer, because low-grade paint never contains a high percentage of white lead.

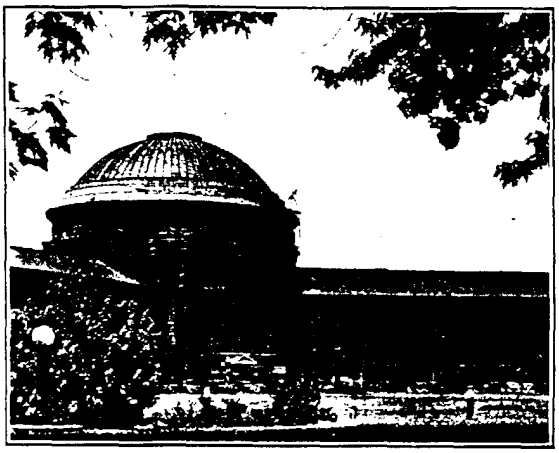
NOTE: Wherever white lead content of paint is referred to in this article, the white lead content of the pigment portion of the paint is meant.

A Hard Lead Roof for One of World's Largest Domes

New Jersey Authorities Select Hard Lead to Recover Rahway Reformatory Dome.

ATOP the State Reformatory at Rahway, N. J., is a huge dome, said to be the third largest in the world and second largest in the United States. At present the job of removing the old covering of another material and recovering this dome with sheet lead to eliminate future trouble and repairs is almost completed.

Originally erected about 40 years ago, this dome measures nearly 400 ft. in circumference at its base and is surmounted by a skylight 26 ft. in diameter. Forming the base of the dome is a series of steps running completely around it. These steps or decks vary in size but average about 5 ft. high and 3 ft. across. The decks have a slope of approximately 1 in. per ft.



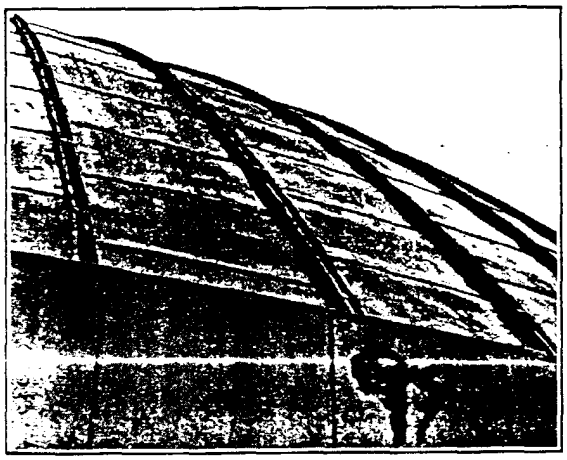
Dome of New Jersey Reformatory at Rahway, N. J., recovered with hard lead down to the steps at its base.

Preparation

The lead roof now being applied is 3 lb. hard lead sheet, which is sheet lead containing approximately 7.5 per cent of antimony. This addition almost doubles the tensile strength of lead. The roof is a batten roof in its entirety. Battens are spaced about 4 ft. apart at the base of the dome and are fastened to the roof by toggle bolts passing through the roof surface and bolted on the underside. Battens are made from 2 in. by 2 in. timber, creosoted and tapered inward slightly at the bottom and with upper corners rounded.

The roof surface was covered with a lining of 30-lb. asphalt felt and an underlining of 11½-lb. deadening felt to form a cushion for the sheet lead.

After the contractor had made his estimate and visited the site to check conditions, two sets of light galvanized iron templates were formed. Two sets were required because cross seams in adjacent bays were staggered making the sheets alike in size and shape only in alternate bays. One set of templates was marked with numbers and the other with letters for identification. All laps and seams were allowed for in making these templates. They were then forwarded to the lead factory, where the hard lead sheets were fabricated and cut to size according to the templates. By performing this operation at the factory, practically all waste was eliminated. The sheets were then shipped to the job marked for location in accordance with the templates.

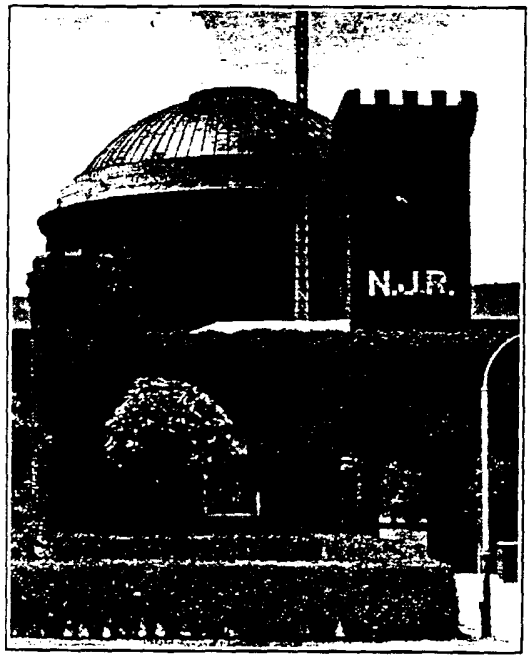


Dome recovered with lead but batten caps not yet placed. The original covering had not been removed from the step in foreground when this picture was taken.

A sheet metal shop, containing the necessary tools and brake, was erected on the ground at the base of the dome, and ladders put up. In this shop, the sheets were performed in the brake as shown in several of the photographs. The sides of the sheets were bent upward 2¼ in. to fit along the sides of the battens and the top ½ in. of this upstand given another turn inward to the horizontal to receive cleats and batten caps. The lower end of each sheet was turned under 1¼ in. and the top edge turned up by the same amount to facilitate making loose locked seams between adjoining sheets.

Light wood templates were also made of the two typical bays for use on the job. As one bay was finished the proper templates were then placed against the batten along the edge of the completed bay to lay out the next bay.

Some Views of the Magnificent Dome on the Rahway, N. J

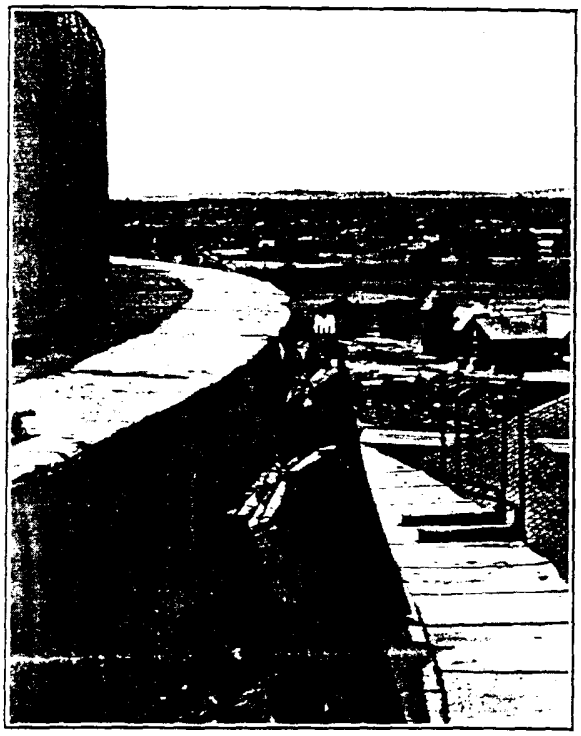


Partly completed job of recovering Rahway Reformatory dome with hard lead sheet for permanence and beauty.

Forming lead roofing sheets in the brake in the sheet metal shop on the ground before hoisting sheets to roof.

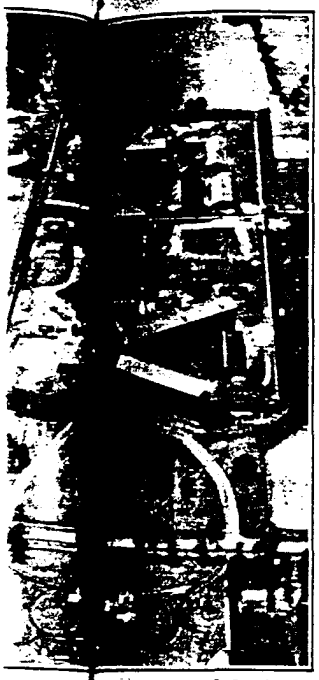
An airplane view Rahway, N. J., st world, in process

Pre-formed lead sheets on the roof ready for installation. The original roof covering had not been removed at this point at time of photographing.



View at junction of dome and top except batten caps but step not yet are [illegible]

N. J. ormatory During Operation of Recovering It With Sheet Lead

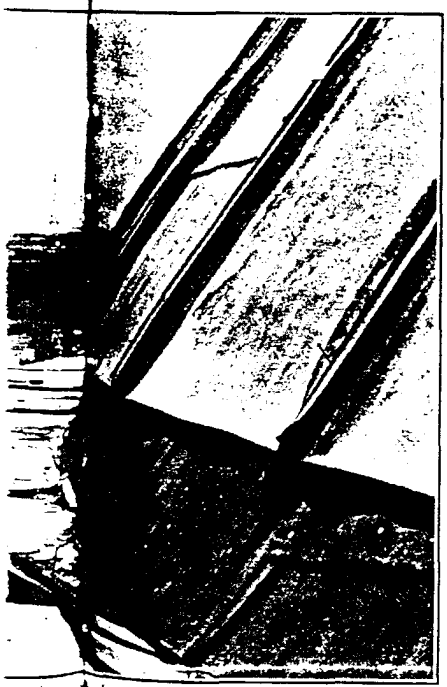


T. C. CAMPBELL

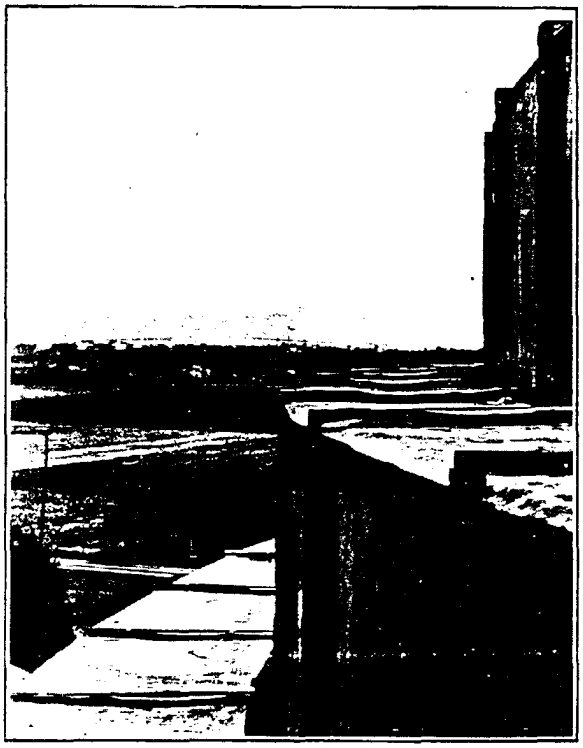
une view ersey Reformatory at N. J., shows third largest in the process o roofed with hard lead

Lead roofing sheets ready for hoisting to the roof after forming the edges in the brake on the ground.

Loose-locked, batten roof after placing lead roofing sheets and ready for lead batten caps. One cap is seen in place, loose-locked to the roofing sheets.



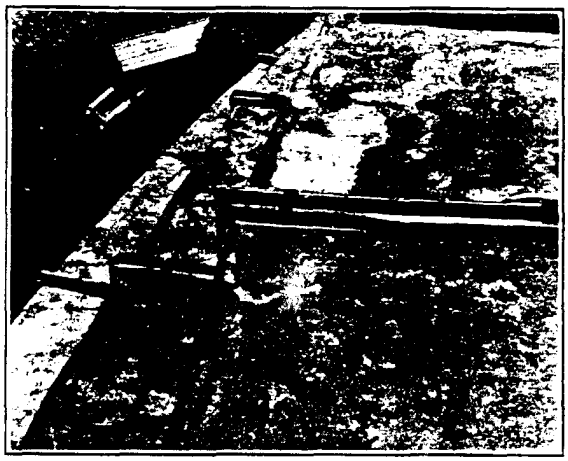
and top lead on the dome has been placed p not yet with lead. The two layers of felt are the lead.



Steps at base of dome recovered with lead except for batten caps.

All photographs of Rahway Reformatory from A. G. MICHAELSON.

LIA25340



Lead-covered steps at base of dome. One lead batten cap can be seen in position.

Installation

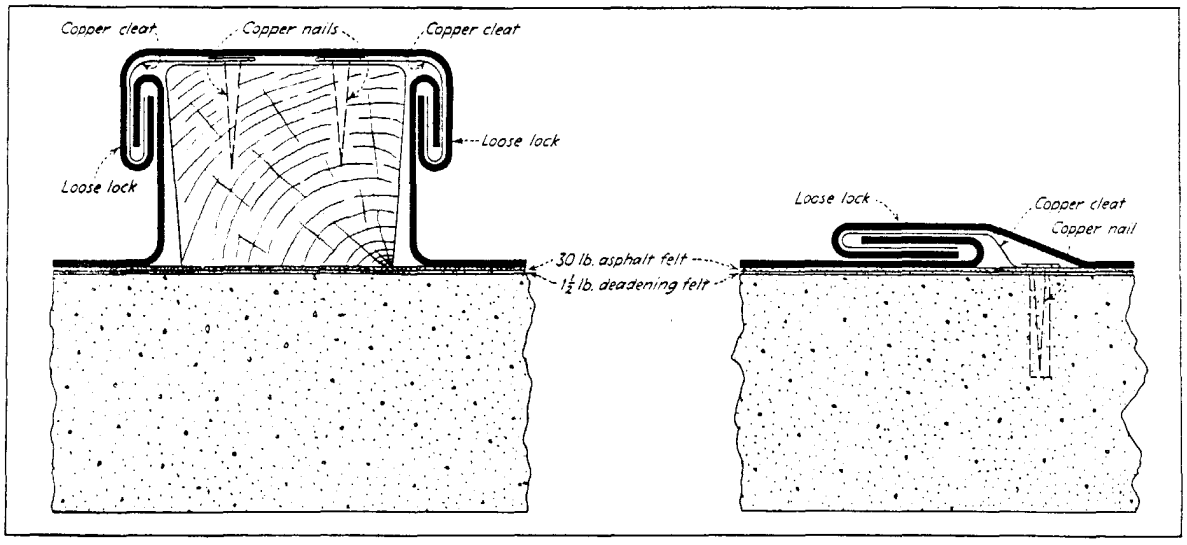
After this ground preparation, the sheets were sent to the roof where they were fastened along the upper edges with cleats on 12-in. centers folded into the top turn-over. The cleats were 16-oz. copper, secured to the roof near their upper ends above the lead sheets by copper nails, and the excess ends of the cleats were folded back over the nail heads to prevent damage to the lead from this source. Sheets were installed from the bottom up and as each succeeding sheet was placed it was loose locked to the one below and secured at the top in the same manner.

The roofing sheets were also secured to the battens by means of cleats nailed to the tops of the battens on 12-in. centers. Batten caps were installed in sections of 8 ft. maximum length and loose locked to the roofing sheets along their sides. Caps were held in place at their upper ends by cleats, while at the lower end each batten simply overlapped the one below by 3 or 4 in., but was held down securely because it was locked to the roofing sheets along the sides.

No solder was used at any point in laying this lead roof, all seams being loose locked, and no nails were driven through the lead sheets, cleats being used exclusively to secure the lead. Thus the sheets are enabled to expand and contract freely in any direction with temperature changes without placing any strain on the metal. In bending the sheets, the brake was adjusted to take care of the thickness of the metal and bends were not made sharp enough to cause any cracking of the metal. In turning the sheets up the sides of battens and vertical surfaces, a small space was left between the upstand of the sheets and the vertical surfaces to permit expansion. All loose locked joints were filled with Vulcatex No. 7200 Non-Hardening Compound further to insure against leakage. The maximum dimensions of the sheets were 4 ft. by 2 ft., except in a few cases where conditions required slightly larger sheets.

This fine large roofing job was done by Edwin R. Huddy & Sons, Trenton, N. J., sheet metal contractors, for the Department of Institutions and Agencies of the State of New Jersey. Mr. W. J. Ellis is Commissioner of the Department, Mr. C. N. Leathem is Director of the Division of Architecture and Construction, and Mr. Walter Hankin is Consulting Architect.

(To be continued)

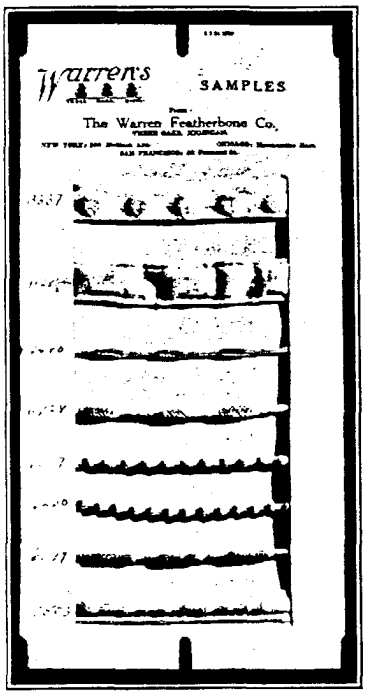


Typical sections through a batten and through a horizontal seam. All joints are filled with Vulcatex No. 7200 Non-Hardening Compound.

Lead Weighted Tape Makes Drapes Hang Properly

LEAD shot, strange as it may seem, occupies a position of some consequence in dressmaking, interior decoration and other applications where one would not ordinarily expect to find it. In these uses, lead, because of its weight, is applied to make dresses, suits, draperies, curtains and display fixtures hang properly.

According to The Warren Featherbone Co. of Three Oaks, Mich., manufacturers of weighted tape for these purposes, there are a number of ways in which lead is used in their products. In one, strips of lead are punched out into small discs which are fastened onto a tape and then enclosed in a casing on a sewing machine. In another, the lead strips are woven into the fabric on a broad loom, the whole then being cut the desired width and enclosed in a casing in the same manner. When lead shot is used to make weighted tape, the shot is fed into the desired covering on a braiding machine. Thus the tapes, whether made from strips or shot, have the flexibility to form themselves to the folds of the material they are required to weight. In lead, great weight is concentrated in a small space at low cost.



WURTS BROS.

Although The Warren Featherbone Co. began manufacturing weighted tape simply for weighting skirts of dresses in 1912, many new uses, as already suggested, have been found for this handy, adaptable product. No doubt it has other applications which have not yet been realized.

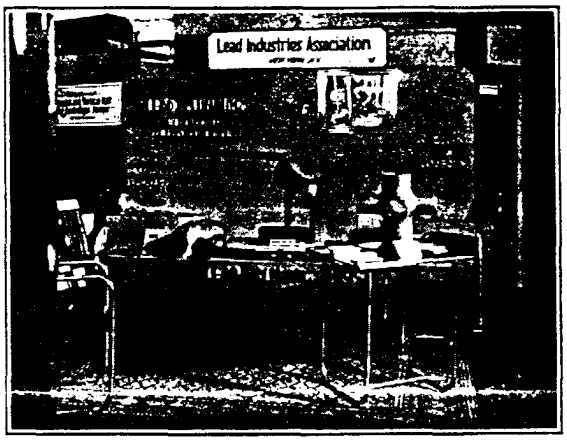
Sample card of lead weighted tapes for dresses, drapes and other hangings, showing a variety of forms available.

Still More Plumbers' Organizations Advocate Lead

THE number of plumbers' organizations actively encouraging greater use of lead in plumbing continues steadily to increase, the Master Plumbers' Associations of Connecticut and Vermont and the Illinois Journeymen Plumbers' Association having recently been added to the ranks. These organizations have adopted resolutions to advocate more extensive requirement of lead by plumbing ordinances and to work aggressively toward the accomplishment of this purpose.

This movement has appealed strongly to farsighted plumbers because it accomplishes two purposes at one stroke. Lead, properly used in a plumbing system, results in the finest installation a property owner can have, and at little or no extra cost. At the same time, lead automatically eliminates from making plumbing installations—which are one of the first safeguards to public health—the incompetent mechanic, who proves costly to the property owner in the long run and may provide unsanitary plumbing conditions. He also furnishes the worst sort of competition to the skilled plumber and tends to lower the standards of craftsmanship in the plumbing trade.

That plumbers realize this is also evidenced by the tremendous amount of interest shown in the display of the Lead Industries Association at the Annual Convention and Exhibition of the National Association of



HEDRICH-BLESSING

Lead Industries Association's exhibit at the Convention and Exposition of the National Association of Master Plumbers. Note hand-made, seamless, six-way lead fitting on table.

Master Plumbers. One of the most interesting items on display was a handmade six-way seamless fitting bossed up from 5-lb. sheet lead by Mr. Harold G. Wilson, of Louisville, Ky., and visible in the right foreground of the photograph. Another piece of Mr. Wilson's fine lead work was pictured in the July issue of LEAD.

There are several methods of making a seamless six-way fitting from sheet lead. One is first to beat it into the form of a sphere, leaving one opening at the top, then find the location of the five other openings and beat the sphere in between these points until it is the required shape, lastly cutting the holes at the positions of the openings. Another way is to form the sheet into the shape of a bell first, then beat the top of the bell into the shape of half the fitting and continue to draw out the rest of the metal by beating to complete the job. Mr. Wilson consumed only 11 hours in making the fitting.

To do this work requires a complete mastery of the art by the craftsman and indicates that any one capable of it is a skilled mechanic who will never be a detriment to the plumbing trade and on whom the public can thoroughly rely.

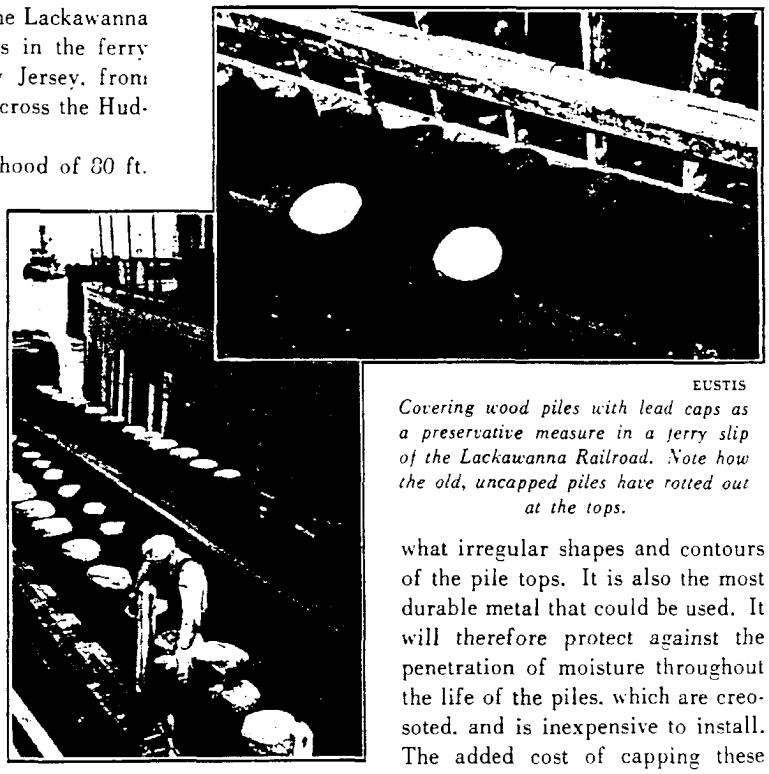
Lackawanna Uses Lead Caps to Prevent Rotting of Piles

SHEET lead caps are being used by the Lackawanna Railroad to cover the tops of piles in the ferry slips at its terminal in Hoboken, New Jersey, from which passengers are carried by ferry across the Hudson River to New York City.

The piles, which are in the neighborhood of 80 ft. in length, extend through about 30 ft. of water into the river bed some 30 ft. Exposure conditions on these piles are rigorous and moisture entering the tops of the piles through the end grain tends to rot them out, often in relatively short time. Maintenance is therefore a heavy item.

Some years ago at the Railroad's Barclay Street ferry slip in New York a number of piles were installed with metal caps to prevent entrance of moisture at the top. These capped piles have lasted an unusually long time. Therefore in replacing rotted piles in the Hoboken slips recently the Railroad decided to cap the new piles they were installing.

The caps consist of 3-lb. sheet lead cut in circles a little larger than the tops of the piles. These caps are then dressed down over the tops of the piles and nailed in place around the edge. Lead is ideal for the purpose because it is so easily handled and made to fit the somewhat irregular shapes and contours of the pile tops. It is also the most durable metal that could be used. It will therefore protect against the penetration of moisture throughout the life of the piles, which are creosoted, and is inexpensive to install. The added cost of capping these piles is small when compared with the cost of the piles themselves and the expense of replacements, while lead's salvage value is high.



EUSTIS

Covering wood piles with lead caps as a preservative measure in a ferry slip of the Lackawanna Railroad. Note how the old, uncapped piles have rotted out at the tops.

Mr. L. L. Tallyn, division engineer of the Lackawanna Railroad, is in charge of this work.