A 92-Year Old Lead Roof at Fort Pulaski, Georgia.

by Ralston Lattimore*

IN 1842 a sheet lead covering was laid over the roofs of the casemates of Fort Pulaski, which is located on Cockspur Island in the mouth of the Savannah River, Georgia. Ninety-two years later, notwithstanding the fact that the fort was subjected to a 30-hour bombardment by Northern forces in 1862, on examination by National Parks Engineer, Reaville M. Brown, the lead was found to be in perfect condition.

The area covered by sheet lead is approximately 1,600 ft. by 30 ft. Two and a half pound lead was used, and purchased at an average cost of about 9½ cents per pound. The arrangement of the roof was complicated. The brick arches were first sealed with a thin coating of cement. Two years later this was followed by a thin coating of pitch on which the sheet lead was directly laid. The lead roof was covered with a layer of bricks, laid without cement, and a covering of earth, to protect the lead against penetration by falling projectiles. Although mortar projectiles dropped on the earth covering from a great height during the seige, subjecting the lead to great strain, the lead was only torn in one place.

Junctions of the lead sheets were raised and the joints protected by two courses of bricks. The lead was carried up against the back of the scarp and inserted in a joint of brick work just below the terreplein, and against this vertical surface was placed a layer of bricks, flatwise. The whole gutter of the roof was covered with an arch made of bricks without mortar, having a span of approximately 2 feet and a rise of 18 inches.

COURTESY NATIONAL PARK SERVICE

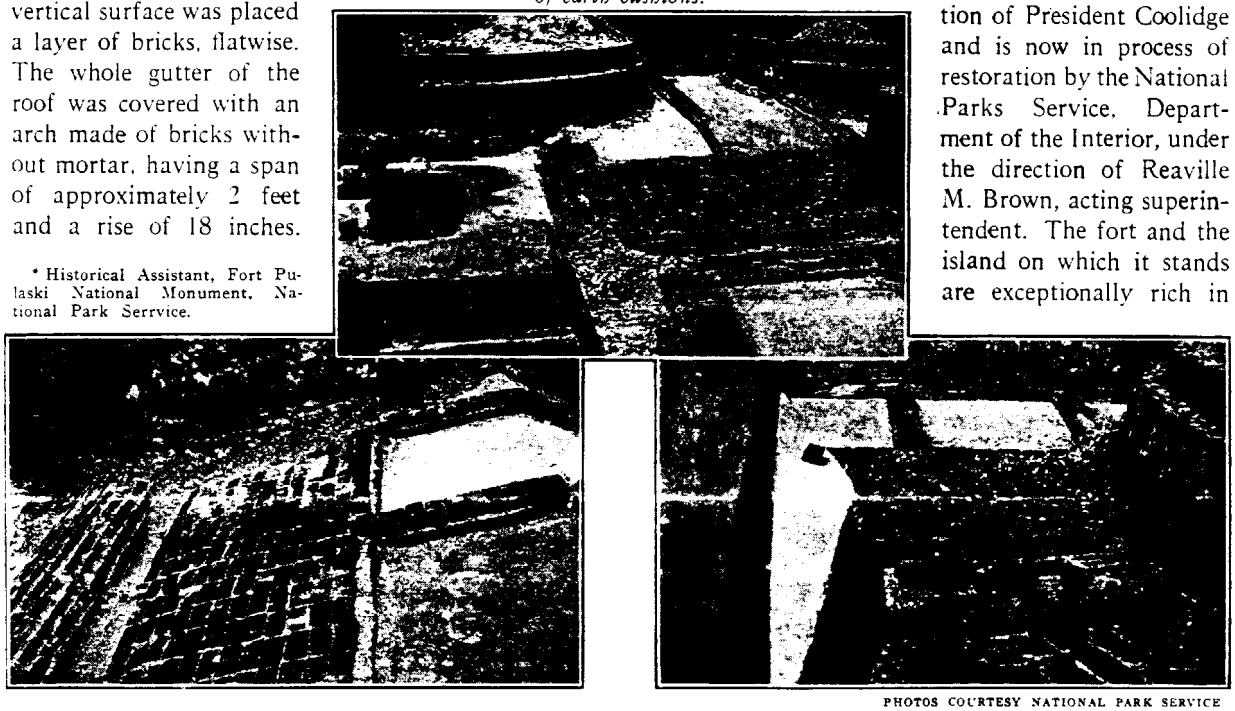
Fort Pulaski, Georgia, showing earth covered lead roof.

Over the gutters were placed first a layer of coarse gravel, then a thick layer of oyster shells, and finally from two to four feet of well-packed sand. On the terreplein so constructed were the barbette guns of the fort.

Construction of the roof, including laying the brick covering without mortar, was so planned as to provide for the filtration and collection of rain water, conducted thence through lead pipes to storage cisterns located at regular intervals in the foundations of the fort. Though the water has become fouled in the cisterns, the system is still in working condition after ninety-two years.

Fort Pulaski was designated a National Monument in 1924 by proclamation of President Coolidge and is now in process of restoration by the National Parks Service, Department of the Interior, under the direction of Reaville M. Brown, acting superintendent. The fort and the island on which it stands are exceptionally rich in

Three views of roof with earth covering and bricks partially removed, showing 92-year old lead roof and brick arch over gutter, as well as gun emplacements on top of earth cushions.



PHOTOS COURTESY NATIONAL PARK SERVICE

* Historical Assistant, Fort Pulaski National Monument, National Park Serrvice.

historic interest, the site having been associated in the defenses of Savannah since Colonial days. Fort Pulaski was named for the Revolutionary hero, Count Casimir Pulaski, who fell mortally wounded at the battle of Savannah in 1779. Robert E. Lee's first military assignment, on being graduated from West Point, was at this post during the early period of construction. Early in 1861 before the beginning of the Civil War, the fort was seized by Georgia troops, and in the following year, after seige and bombardment, it was recaptured by Northern forces. It was used during the latter months of the War as a military and a political prison for detention purposes.

White Lead Used on Own Homes By 86% of Master Painters

A QUESTIONNAIRE sent in September, 1934, by the Forest Products-Better Paint Campaign to approximately 3,000 master painters in all parts of the United States has revealed that, of the 269 who replied, 232 or 86 per cent, had painted the exterior of their own homes with white lead the last time they were painted. This is an overwhelming vote of confidence in white lead by those who really know paint and whose businesses and reputations depend upon it. This is brought home particularly forcefully when it is realized that the results show six times as many master painters using white lead on their own property as use all other paints combined. The results are a comparison of white lead against all other paints not just one other paint.

When a painter does a job he may have to use paint specified by an architect, real estate operator or home owner, but when he paints his own house he applies the paint he himself thinks best. After all, the painter is in a position to judge the quality of paint. His life is spent with it; his livelihood depends upon it. When he paints his own property he has no one to satisfy but himself. He will select the paint which his own experience has taught him will beautify and protect his property best and for the longest time, and which will be easy and inexpensive to repaint when that inevitable time arrives. His choice is based upon hundreds of jobs he has done in the past and the knowledge of how the paint has performed on each of these.

Therefore, when such an overwhelming majority of master painters places its confidence in white lead, it is a striking testimonial to the dependability of this time-tried paint.

The questionnaire referred to here consisted of business reply cards simply requesting painters to assist the Forest Products-Better Paint Campaign in surveying the practice of reputable master painters in painting their own property. No reply was to be made in the event that the master painter did not own his own home. No signature was necessary on the reply card. The reply card provided space for checking either white lead or "some other paint." Since those painters not owning their own homes did not reply, the percentage of returns was lowered accordingly.

Obviously the replies to this questionnaire give a true picture of what the master painter thinks of white lead, and from the large percentage who apply it to their own property, he apparently thinks very highly of it.

Many master painters who answered the questionnaire took the trouble to write their own comments on the cards. Typical of these comments are the following:

Our outside painting is all done with white lead. Somerville, Mass.

I do not believe a paint exists that can outlive white lead and linseed oil paint from any standpoint. Sacramento, Calif.

I own my own home and painted it last, October 1924, with white lead, is in good shape yet, will paint again this fall.—Shreveport, La.

In the past 18 months I have painted all my property with white lead and I have 20 separate pieces. —Baltimore, Md.

Thirty years experience and there is nothing can take its place.—Cincinnati, Ohio.

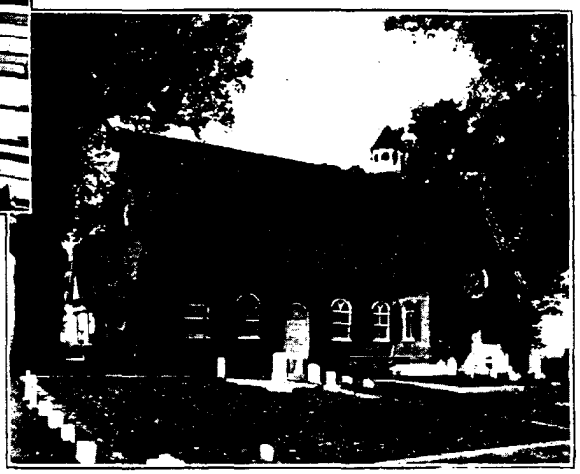
I own my own home and painted it last with white lead, July, 1924, and repainting now, October, 1934.—Nashville, Tenn.

This survey is another convincing bit of impartial evidence as to the competitive ranking of white lead as a paint. Other sources of unbiased information will show a similar high regard for the pigment. The paint specifications of the Federal Government, the specifications of State Highway Commissions, the comparative tests of State paint investigations, the practices of railroads, confirm the conclusion that white lead-in-oil paint is a preferred product.

White Lead Paint Pr

Lovely St. Thomas' Church, Green Spring Valley, Md. The interior walls are finished in white lead, tinted, and the pews and other wood-work in enamel over white lead ground coats, all in perfect condition after eight years.

protection and beauty to this landmark. In Green Spring Valley, near Baltimore, is lovely old St. Thomas' Church, for many years the place of worship of Maryland notables and scene of many prominent weddings. The interior walls are painted with pure white lead, stippled, and the beautiful wood pews, pew



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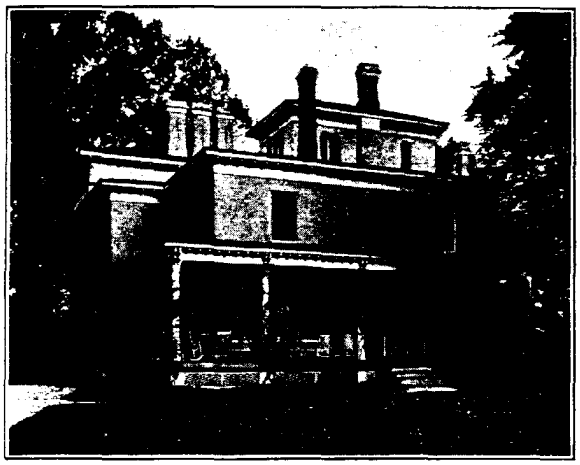
IN Maryland are many fine old homes and buildings of the early days of this country which have been protected and beautified by pure white lead paint through the years. Perhaps one of the best known and loveliest estates is White Hall Manor, near Annapolis, erected before the Revolution by Governor Sharp, last Colonial Governor of Maryland. Because of a whim of the Governor that he wanted no one living or walking over his head, the building is so constructed with the central hall rising to the roof and wings with separate stairways and entrances that this whim was satisfied. At White Hall Manor also is some exceptional wood carving performed by Hessian soldiers. This famous old place was painted this year with pure white lead paint, which can be relied upon to give appropriate



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The stucco walls of the Von Kapff house at Stoneley, Md. were painted eight years ago with pure white lead, and the paint is still in excellent shape.

Grim Evidence of Rec

SELDOM is seen such grim evidence of the value of red lead paint for metal protection and particularly when used for priming coats, as was viewed by those who journeyed to Asbury Park on Sunday, September 9, to see the wreck of the Morro Castle then stranded on the beach. This ship, the victim of the latest sea tragedy, had just been towed and then drifted ashore after having been almost completely destroyed by fire. One newspaper man in his description of the hulk as she lay on the beach had the following to say:

Even after the terr the priming coat

"On the sides of the vessel the paint was blistered and peeling. Great flaps of it had come loose and were moving in the breeze. The ship had been black to the water line, and as the paint dropped off, it revealed the red lead beneath."

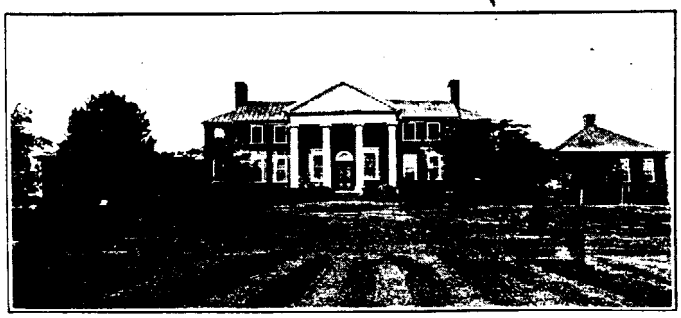
The foregoing is by no means derogatory to the

Maryland Landmarks

gates and other woodwork are finished with enamel over ground coats of pure white lead. Although last painted eight years ago, the effect is still one of startling beauty and simplicity for white lead not only makes the most beautiful decoration possible when skillfully handled but makes that beauty lasting.

The large Von Kapff house at Stoneley, also near Baltimore, was built nearly 90 years ago of masonry finished with stucco. Its stucco exterior was completely painted last with pure white lead paint about eight years ago and today, after eight years of weather exposure, the white lead paint is in excellent condition.

An old Baltimore residence, the Wyman House, although brick construction, has been entirely painted with white lead for years. In the last thirty years it has required painting only three times. Two of these paintings, and possibly the third, were with pure white lead. The white lead was tinted to gray, green and yellow for various purposes on this house. The interior, which was also recently painted with pure white lead, had not previously been painted for a great many years, at least 30.



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Front and rear views of pre-Revolutionary White Hall Manor, near Annapolis, Md., recently painted with pure white lead paint, which can be depended upon to preserve this historic landmark.

Brick and stucco houses may be painted to advantage, either for decoration, protection, or both. These materials always possess a certain amount of porosity which permits the entrance of moisture. This may make the house damp or it may cause eventual disintegration of the brick and stucco. Paint prevents the entrance of this moisture.

All of the painting described in this article was performed by John D. Beckley & Sons of Baltimore, who almost invariably use pure white lead paint for both exterior and interior work.

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The Wyman residence in Baltimore, whose brick exterior and roof, as well as its interior, are painted with pure white lead.

Red Lead Paint Value for Metal

INTERNATIONAL NEWS PHOTO

...ific ... the ill-fated Morro Castle, ... of ... paint clung tenaciously ... el.

black paint, because the heat of the burning ship was so intense that iron and glass were melted and it is no wonder that the paint peeled. It is a tribute, however, to the adhering qualities of the red lead paint which had been used for the priming coat — *Reprinted from Sheet Metal Worker, September, 1934.*

In its recent publication "Red Lead Paint, Its Usages and Advantages," the United Kingdom Lead Oxide Convention calls attention to the lamentable destruction by fire of the great French liner *L'Atlantique*, which all will remember. The London *Times* is quoted as follows:

> ". . . The plates of her hull have 'rippled' owing to their expansion by the heat. Nearly all the black paint which covered the hull has gone, leaving the Red Lead priming exposed."

New Cast Iron Main in Bethlehem, Pa., Jointed With Lead

BETHLEHEM, Pa., which can boast of having had the first water works in the United States, recently laid 2,600 ft. of 16 in. and 20 in. cast iron pipe. This new main is to back up existing systems on the West and North Sides of the City. Although a C.W.A. project, joints were made by the water department's own expert team for jointing, all joints being poured lead.

DENNIS PHOTO SERVICE CO.

Bethlehem, Pa., water department team calking lead joints in new cast iron bell and spigot water main.

This care to use only materials thoroughly proven by experience has always been followed by the Bethlehem water and plumbing departments. Mr. Ario Wear, in charge of the water department, feels that he is not justified in experimenting with untried materials when heavy expenditures would be caused by their failure. This is particularly true in jointing cast iron mains, for such mains, when placed in the ground, are expected to last a century or more, so that materials used for any shorter lengths of time are untried so far as cast iron mains are concerned. Mr. Wear feels that the wisest policy is to adhere to the use of time-tried lead, as it has given the department many years of satisfactory service and its performance can therefore be accurately gauged.

In Bethlehem, lead is also extensively used for water services and for interior plumbing. Thus home owners in that city have found that plumbing facilities provided them are of the most durable and economical kind.

The plumbers of Bethlehem have learned that, by benefitting the property owners in this way, by giving them the best plumbing they can buy, they have materially benefitted themselves. Bethlehem plumbers have no fault to find with the condition of the plumbing business in their city. They are free from the ruinous competition of handymen and outsiders because their plumbing inspector, Mr. E. H. Meglathery, has insisted on strict adherence to the first principles of plumbing, durable materials and skilled workmanship. The local plumbers have realized the wisdom of this policy and have cooperated by using lead for all wastes under bathroom floors, lead bends, and lead at other vulnerable points of the plumbing system, and avoiding the use of less durable pipe. So pronounced is the healthy condition of the plumbing business in Bethlehem that even plumbers in other cities express their admiration of the way plumbing ordinances are administered and followed there.

Bethlehem's method of protecting its investment in water supply lines, and the quality of the plumbing furnished home owners, is the same method used in city after city in the United States where the unexcelled favorable characteristics of lead have been appreciated for many years.

Genuine Lead-Tin Solder in Collapsible Tubes

Convenient tube of new self-fluxing genuine lead-tin paste solder.

A GENUINE lead-tin solder in paste form with the flux mixed in has recently been placed on the market, packaged in attractive and convenient lead collapsible tubes. It should find favor quickly, particularly with the occasional solder user, because of its convenient form and the ease with which it may be applied. To solder two pieces of metal, it is simply necessary to clean the metal, squeeze some of this flux-containing paste solder along the edges to be joined, place the pieces of metal together, and

run a hot soldering iron down the seam. A match or candle may be used instead of a soldering iron, in which case the flame should not play directly on the solder, but rather on the metal near the solder.

There have been and are other products put up in collapsible tubes and called "solder" which are not genuine solders as known to the trade or as the word "solder" is generally defined and used. Some are simply mixtures of lacquer and aluminum powder, which makes a highly inflammable and dangerous combination. Heat is not intended to be used with such a substance, but should it inadvertently be applied or should this kind of so-called "solder" be used for electrical connections, the result might be very dangerous.

Since these substances are not really solders but are simply cements, the user is warned against confusing them with genuine solder. They are cheap substitutes and can not do the job of the genuine lead-tin solder in paste form recently introduced. For a real quick solder job the genuine liquid lead-tin solder will be found a surprising convenience but it is well to inquire when making purchases whether the solder offered is made of lead and tin.

Lead Shingle Silhouettes Attractive

A FRESH and attractive note in leadwork comes from the far west in these silhouette shingles or signs made from hard lead sheet. They tell their stories in a striking and pleasing way, thus accomplishing the purpose of signs, yet they are harmonious with their surroundings and appropriately dignified. Hard lead signs are less expensive than bronze. They do not discolor adjacent materials. If a contrasting color is desired, parts of the sign may be tinned on the surface, resulting in a pleasant contrast between bright tin and soft gray lead.

Lead silhouettes have a number of other uses. They may be mounted between glass to form ornamental grilles (LEAD, September, 1932) or they may be used under glass to make decorative trays, table tops and other similar devices.

For an inexpensive, beautiful gray, non-staining, enduring metal silhouette, lead is without an equal.

The hard lead silhouettes pictured here were all created by Frank Edmands of Seattle, Wash.

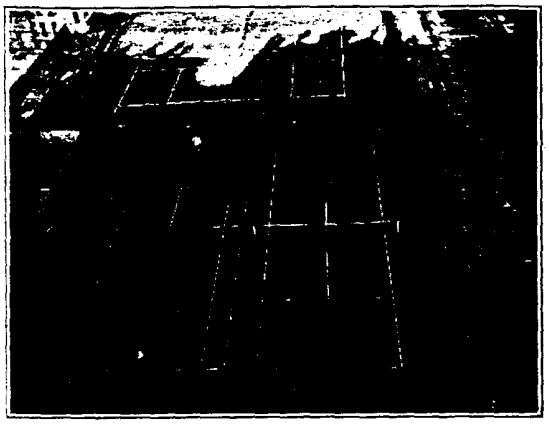
Hard lead shingle silhouette for child specialist physician, Seattle, Wash.

Appropriate lead shingle on a Seattle lending library.

Silhouette shingle made from antimonial sheet lead, on an architect's office in Seattle.

A landscape architect finds a hard lead shingle silhouette attractive.

Lead Tennis Court Tapes on Fine New Courts



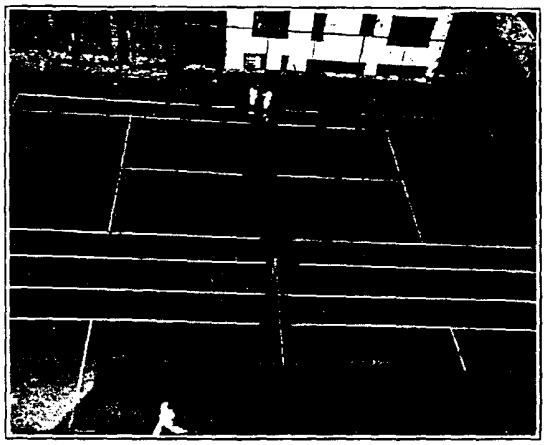
Courts of Tudor City Tennis Club, E. 41st St., New York. Note the precision of lead tapes on courts in foreground compared with irregularity of lime lines on far courts.

TENNIS court lines made of lead tape are becoming increasingly popular among players and court builders for the finest and most modern courts. Three recent installations are illustrated here, at famous Fresh Meadow Country Club on Long Island and in the well-known Tudor City development and at the East 73rd Street Tennis Club in New York City. These courts were all built by Ferger and McDermott of Hamilton Beach, Long Island, N. Y., using their Rigmac Red Top Fast Drying courts and lead tapes. Lead tapes need only be painted once a year with two coats of traffic white paint, that being their only maintenance.

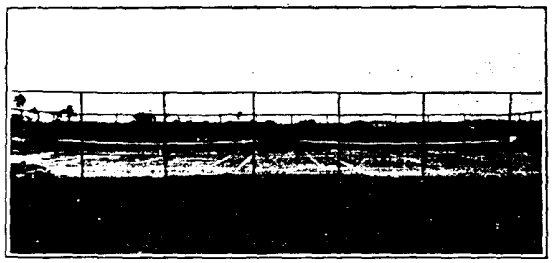
Lead tapes have many advantages over the old lime markers. To the commercial court operator, the largest item is probably low maintenance and time saving. For instance, in the heavy rains of the past September, an operator of 25 commercial courts having lime lines lost approximately three hours a week during which lines were being remarked after rain had washed them out. Courts could not be used during that time and consequently considerable revenue was lost. Had the lines been lead, a quick brushing to remove dirt and they would have been ready for play. In addition to keeping the courts in play longer, lead lines save the cost of constant remarking, materially reducing court maintenance.

To the player there is great advantage in the absolute accuracy of lead markers. It is practically impossible to mark lime lines exactly straight and true, as clearly shown in one of the photographs where both lead and lime lines appear on adjacent courts. Lead tapes are laid by experts to exact measurements and are therefore permanently accurate. Also lead lines cannot become scuffed out, causing questionable decisions.

So to player and court operator alike lead lines are an advantage, which is now widely recognized and accounts for the use of lead markers on such fine recently built courts as those illustrated here.



East 73rd St. Tennis Club, New York City, whose new courts are marked with lead tape lines.



These fine courts at Fresh Meadow Country Club, Flushing, Long Island, have lead tape markers.

Lead Shot, A Peace-Time Product

THE cover of this issue of LEAD is just a seasonal reminder that this is the time of year that tons and tons of lead shot are emptied into the air in quest of game. Since there are about five tons of shot manufactured in the United States to every ton of bullets, and since practically all shot and many bullets are shot in peaceful pursuits, it is quite obvious that the manufacture of lead ammunition is really a very peaceful occupation.

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