



Pure White Lead Paint Used Throughout Phillips Academy, Andover, Mass.

BEARING all the dignity of a great college, Phillips Academy at Andover, Massachusetts is rich in historical associations and traditions. It was the first academy or preparatory school incorporated in the United States and has been the model for many later schools. Founded in 1778 "Phillips of Andover" has been, for one hundred and sixty four years, graduating soundly prepared young men ready to complete their education at college. It has a long list of famous and illustrious alumni. There was a theological seminary connected with the school from 1808 until 1909 but Phillips Academy has always been non-sectarian, although under strong religious influence. The headmaster's house was the scene of the organization of several enduring re-

ligious societies and of the founding of the first religious newspaper in the world.

Phillips Academy has grown through the years and now owns more than one hundred buildings, some new and others dating back nearly to the founding year. They are generally Classic or Colonial in type and the generous use of large white painted areas make them attractive pictures when viewed through the trees of the campus.

No less sound than its curriculum and discipline is Phillips' building maintenance program which has kept the cherished buildings in excellent condition. Only pure white lead paint is used on all the buildings, inside and out. Their trim clean appearance is the result of the ability of white lead

paint to rid itself of accumulated dirt without sacrificing its durability. White lead paint has protected the historic houses on Phillips' campus, some of them for more than one hundred years and their excellent condition attests white lead's endurance.

Even the best behaved of active boys are none too easy on their school-rooms, but with pure white lead paint on the walls, keeping the rooms as trim and shining as the exterior is only a matter of periodic washing.

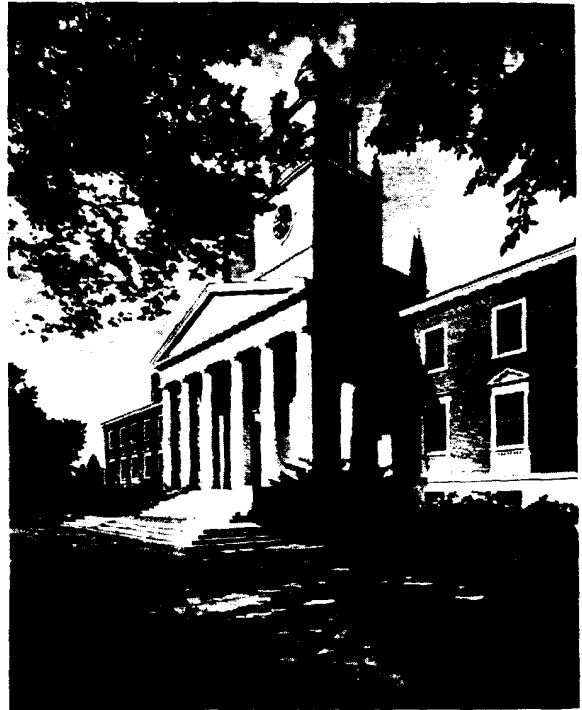
Beauty, durability and ease of maintenance are the most desirable qualities in a paint material. The combination of well preserved old houses and practical new buildings at Phillips Academy demonstrates convincingly that pure white lead paint has these attributes in high degree.

Chapel on the campus of Phillips Academy. White lead painted trim and tower gleam in pleasant contrast to brick and foliage



DAYTON SNYDER

Samuel Phillips Hall, main building of Phillips Academy, Andover, Mass. Offices and school rooms as well as exterior woodwork are painted with white lead



DAYTON SNYDER

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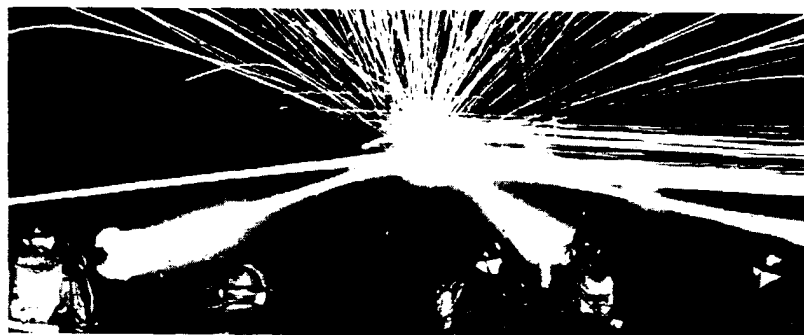
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Night firing .30 caliber machine guns on practice range. Bullet traces from gun muzzles show uniformity of flight of bullets

ACME PHOTO

Lead Helps to Make the Army's Bullets Accurate and Hard Hitting

FEW countries owe so much to the lead bullet as does the United States. In older lands the savage peoples had been conquered by cold steel and military organization but here individuals and small groups of peace seeking settlers depended largely upon their rifles to protect themselves while they pushed their settlements farther into the wilderness. The long rifle for which the woodsman moulded his own lead bullets supplied in accuracy the power that he lacked in numbers. It was also the ancestor of the precision repeating rifle and of the machine gun which are the basic weapons of modern armies.

Just as the rifle has undergone great changes, so has ammunition developed, keeping pace with discoveries in the fields of ballistics and explosives chemistry. The modern bullet bears small resemblance to the "ball" that the early settler cast so carefully at his own hearth or campfire. Nevertheless, today's streamlined projectile still depends upon lead to give it weight and balance. This is true of all small arms ammunition including that for the .50 caliber machine gun.

There are three general types of ammunition for small arms, namely the "ball cartridge," (which fires the regular pointed bullet) the armor piercing bullet, and the tracer bullet. In each one there is a certain quantity of lead. Each bullet has an outer jacket of high grade brass. The "ball" cartridge projectile is solidly filled

with a lead core, but the tracer bullet is only partially filled with lead. The remaining space is pressed full of a pyrotechnic compound which makes the flight of the bullet visible to the gunner. It also serves as an incendiary for destructive purposes.

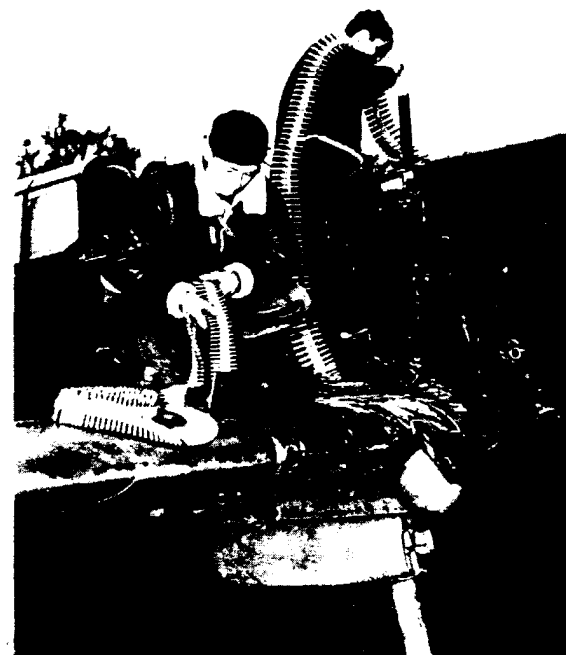
The armor piercing bullet has a blunt hardened steel core under the jacket with the space between the blunt core and the pointed nose of the jacket filled with lead. The lead not only

adds weight to the bullet but also functions as a lubricant to ease the bullet through the armor plate.

Lead for modern bullets is supplied to the manufacturing machines in the form of extruded rod. This lead rod must be of extremely accurate diameter in order that the automatic machines will cut off exactly the same weight of lead for each bullet. Each lead slug is swaged to proper shape and then pressed into the jacket which is made on another automatic machine. The procedure is generally the same for all small arms ammunition.

Practically all small arms used in modern warfare are either automatic or autoloading. Great quantities of small arms ammunition are used by fighter planes and bomber armament, and supplies must be kept flowing to fighting units. However, supplies of lead are such that with ample tonnage provided for ammunition manufacture and other military uses, there is still sufficient for essential civilian use, such as plumbing and painting. There is no reason, at present, why less durable materials than lead should be substituted in the paint that protects our buildings or the plumbing pipes that protect our health.

Loading the .30 and .50 caliber machine guns of a fighter plane. Any one of these bullets can bring destruction to an enemy bomber. Each is weighted with lead to give it the best ballastic characteristics



ACME PHOTO PASSED BY U. S. CENSOR

LIA25711

Lead Paints Ideal for Maintenance Painting of Farm Machinery

IN these war times when food production must be kept at a high peak to insure ultimate victory, it is essential that farm machinery be properly maintained at its greatest efficiency. Rust, one of the prime destroyers of metal machinery, annually causes economic loss reaching staggering figures. In peace times this loss is unfortunate; in war times it may well be disastrous. Tractors, cultivators, mowers, reapers and binders—equipment which may be irreplaceable for the duration of the war—are rapidly destroyed by rust unless adequately protected.

The prevention of rust can be simply and effectively accomplished by covering the iron or steel with paint. Almost any paint, applied any way will be of some value, but certain pigments are known to be superior for use on iron and steel. These pigments are red lead and blue lead. Red lead and blue lead paints have a unique characteristic that sets them apart from many so-called rust preventative paints. This characteristic is the ability to inhibit or prevent rust. Many paints form a protective coating over metal but are practically neutral as rust inhibitors. This means that the slightest break in this type of paint film will allow rust to commence its destructive action. On the other hand, red lead or blue lead paint will continue to prevent the formation of rust even after the paint film has become porous to moisture. This property, common to both red lead and blue lead paints, combined with lead's unsurpassed durability under every condition of weather has made lead paints the standard for rust prevention. Structural steel, bridges, ships, tanks and machinery the world over rely on these lead paints for continuous protection from rust.

Conservation of essential farm machinery by means of rust preventing red lead or blue lead paint is relatively simple. It can be done at odd times, the materials are inexpensive and easily obtained, and most of the tools

and equipment are already at hand on every farm. The materials required are the pigment (red or blue lead), linseed oil, turpentine, and drier. The equipment, suitable containers for mixing and handling the paint, brushes, strainer (screen wire or discarded stocking), scraping, stirring, and dusting tools and rags and kerosene to remove grease. There are only three essential points that must be remembered for a completely successful program: (1) the surface must be clean and free from rust or foreign matter before painting; (2) the paint must be properly prepared according to recommended formulas; (3) the paint must be properly applied, the surface thoroughly covered.

In preparing machinery for painting remove all loose rust and scaly paint by wire-brushing or scraping. A soft brick or sand rock dipped in water may be used to scour deep rust from metal spokes and similar surfaces. Wash off all grease and other

foreign matter with kerosene. Allow to dry thoroughly and brush off all dust.

To make home prepared red lead paint from dry red lead follow the steps given below:

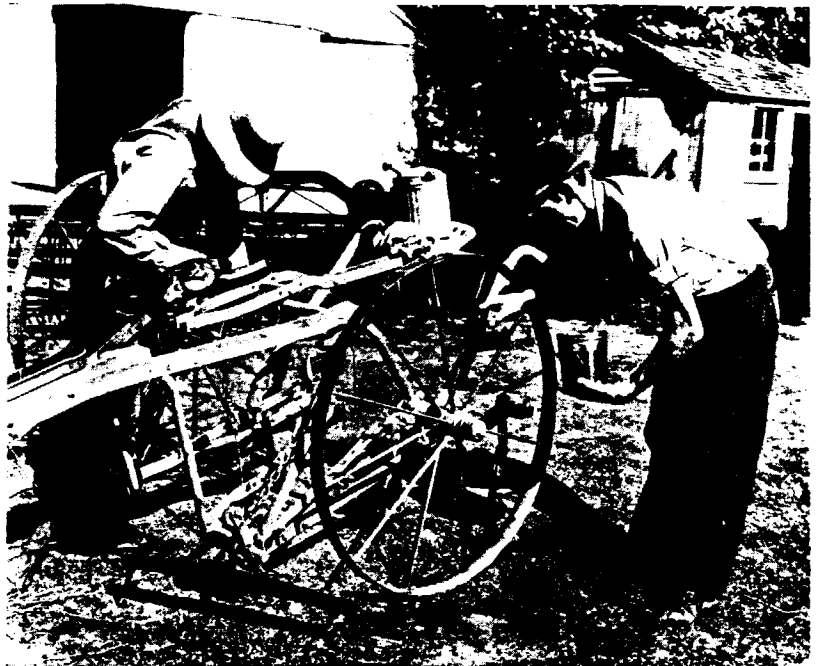
1. Mix 3 parts (by volume) of dry red lead with 1 part of raw linseed oil. Allow this mixture to stand for at least three days so that the oil will thoroughly wet the red lead.
2. Thin the above paste to painting consistency with an equal volume of thinning mixture consisting (by volume) of 6 parts raw linseed oil, 2 parts turpentine, 1 part liquid drier.
3. Stir thoroughly and strain before application.

The following materials are needed to make approximately 1 qt. of red lead paint according to the above formula:

- 5 lb. (about 1½ pt.) dry red lead
- 1½ pt. raw linseed oil
- 1-3 pt. turpentine
- 1-6 pt. liquid drier

The 5 lb. of dry red lead is mixed with ½ pt. of raw linseed oil to make

Preparing the cultivator for painting with red lead, showing clearly the use of wire brush and brick, used in removing scale and rust. Also kerosene and rags for use in removing grease



the paste as noted above and the remaining ingredients are used to thin this paste to make approximately 1 qt. of red lead paint ready for brushing.

If red lead paste is to be used instead of dry red lead mix by volume as follows:

- 12 parts paste red lead
- 10 parts raw linseed oil
- 1 part turpentine
- 1 part drier

Stir thoroughly and strain as for dry red lead paint before application.

The same proportions, by volume may be used to make an equally durable paint from dry or paste blue lead. However, both red lead and blue lead paints can be obtained ready mixed from many paint dealers. Apply the paint to all exposed iron and steel surfaces. Brush thoroughly so that the paint will penetrate any existing pits or scratches in the metal. Move all lever linkages so that no surfaces remain unpainted. Paint wheel tires of cultivators and other equipment which will stand unused all winter. It is best to have a small brush for rods

Giving a veteran cultivator a coat of red lead paint which will forestall the ravages of rust and help to keep it working "for the duration" and after



and wheel spokes as well as an old brush that can be forced into hard-to-get-at places. Allow plenty of time for drying. If some other finish color is desired, apply a finish coat of white lead paint tinted as required with colors in oil.

The fall is an ideal time for painting farm machinery. After harvest and fall ploughing are completed, practically all equipment will stand

unused until spring or early summer. Proper painting now will prevent destruction of vital parts and reduce chances of breakdown during critical periods of next summer's work.

Red and blue lead paints for farm machinery and white lead for the farm buildings makes red, white and blue for patriotic steel conservation and increased food production in our country's time of need.

British Research Finds Lead Paints to be Superior Protective Coatings for Iron and Steel

It is sometimes a little surprising, in these times, to look through a current copy of a British trade magazine and see items and articles devoted to such everyday problems as maintenance and upkeep. However, the correct solution of such problems is of vital importance in the conservation of existing materials which occupies a position of importance almost equal to the production programs for new materials.

A study of protective painting of iron and steel, undertaken in 1936 and carried on continuously in spite of the war is summarized in the March, 1942 issue of "The Decorator," a magazine published in London. This study by the joint committee on corrosion and protective coatings of the British Iron and Steel Federation and the Iron and Steel Institute disclosed facts of interest and great value to all who are responsible for the protection and pre-

servation of steel structures. These facts tend to maintain the position of lead pigments at the top of the list of materials suitable for use in painting exposed steel surfaces and, in addition, emphasize the necessity of proper preparation of surfaces before paint is applied.

It was demonstrated by the tests that thorough cleaning of the surfaces to be painted was absolutely necessary if maximum life of the protection was to be expected. Also, that painting should follow immediately after cleaning for best results.

The summary reads, "Of all the available materials, it is stated, that none functions so well as red lead." Also, "Investigations . . . have shown that the addition of unlimited amounts of extenders to red lead has a deleterious effect on the protective value of the paint . . ." "All the painting tests . . . show that the best results are

obtained when the paint applied directly to iron and steel is pigmented with inhibitive pigments, those quoted as being of this type being red lead, white lead, lead chromate, blue lead—basic sulphate of lead—zinc chromate and other sparingly soluble chromates, zinc dust and possibly zinc oxide. The committee's tests have indicated that the most effective of these primers for general use is red lead, and that chromate pigments are not, on the whole, quite so good; they give good protection in rural and marine atmospheres but are inferior to red lead in industrial atmospheres."

The findings of the committee clearly indicate that no other paint material can take the place of lead pigments in the protection of steel structures. It is indeed fortunate that adequate supplies of those pigments are today available to cover the great quantities of steel now being fabricated into the buildings for the defense industries and that the proper preservation of these buildings for peace time uses can be accomplished without hampering the war program.



No. 15

Beautiful Augusta Homes Typical of the Old South

AS the birthplace of the Southern textile industry and the center of a most fertile agricultural region, Augusta, Georgia, is steeped in the traditions of the old South. Founded in 1735, almost the entire territory now covered by the city was a battlefield during the Revolutionary War. General Washington received a warm welcome when he visited Augusta in

The Setze Mansion in the heart of Augusta with its four stately columns and triple balustrade is an architectural gem in its gleaming coat of white lead paint

The Parker House built shortly after the War between the States, is a splendid example of the spacious Victorian home of the Ante-Bellum period. Its well-kept appearance is due to a consistent maintenance painting program with pure white lead



Built about 1830, the Appleby Home is a typical example of the architectural expression of the Ante-Bellum South. This charming, old mansion owes its excellent preservation largely to a protective coating of white lead paint



PENDLETON PHOTOS—AUGUSTA, GA.

1791. Augusta, likewise, was the ordinance center for the Confederacy during the Civil War.

As the site of the first cotton gin, Augusta became the birthplace of the cotton textile industry and today she holds a position of importance in manufacturing as well as agriculture.

While Augusta has ever been a leader in war as well as in peace, probably its most cherished contribution to posterity are the beautiful mansions which reflect the gracious living of the old South. Many of these are still in perfect condition, serving the descendants of the original owners. Comprehensive maintenance programs featuring white lead paint have helped to preserve these treasured landmarks for future generations to enjoy.

THIS IS NO. 15 OF A SERIES REPRESENTATIVE OF THE MANY AMERICAN LANDMARKS IN VARIOUS SECTIONS OF THE COUNTRY THAT ARE PRESERVED FOR THE FUTURE WITH PURE WHITE LEAD AND OIL PAINT. MANY OF THEM HAVE ALWAYS BEEN PROTECTED WITH THIS RELIABLE MATERIAL ACCORDING TO AVAILABLE RECORDS.

Manufacturing and Use of Wiping Solder for Lead Water Services is Permitted

WPB Places Lead In Group of Materials Available as Substitute for More Critical Items

REVISION of Tin Conservation Order M-43-a by the War Production Board early in August to permit the manufacture and use of wiping solder containing up to 38 per cent tin by weight for the installation and repair of lead water service pipes has removed another obstacle from the path of the water works engineer.

Having earlier been granted the privilege of installing lead services because of the favorable supply position of lead, he will now be able to get wiping solder to make the installations at least until January, 1943. Furthermore, this revision has officially been interpreted to apply whether the water service is installed by the utility or

water works itself, or by a plumbing or other contractor.

With lead also available and permissible for making joints in cast-iron bell and spigot pipe, a number of the water works engineers' most troublesome material problems have been solved. Meanwhile, the Bureau of Industrial Conservation of WPB has issued a revision of its lists of critical materials arranged according to relative scarcity. Lead is in Group III of this list, materials in Group III being described as "Materials that are available in significant quantities as substitutes for less available materials, and materials that are available in large amounts unless restrictions are imposed by labor, manufacturing, or transportation difficulties." Thus lead may now be used, not only for its regular purposes, but where suitable to save more critical materials which include practically all metals.

There appears to be no reason now for the government and others to forego the desirable and time-tested qualities of lead in building construction for such uses as plumbing, water services, calking, flashing and paint. As a matter of fact, the latest revision of the Army and Navy Munition Board's list of prohibited materials for building construction places virtually no restrictions on the use of lead for these purposes. Thus lead may be used to improve the quality of current construction and save critical materials. Even in temporary construction, it must be remembered that lead has a high salvage value, representing a substantial percentage of its original cost, that may be realized any time a building is torn down.

Only about two-thirds of the lead available for use each month is actually going into consumption at present, leaving a very sizable tonnage to employ in saving more critical materials. Thus every time lead is used where a more critical material might have been employed, it may mean another machine gun, anti-aircraft gun, high explosive shell or tank.



The following articles and reprints contain information, drawings and specifications on the use of lead products helpful to architects, engineers and others in the construction industry. They are available, free of charge, upon request to the Lead Industries Association, 420 Lexington Avenue, New York City.

WHAT TO EXPECT FROM WHITE LEAD PAINT

An attractive 28-page booklet with charts, formulas, and mixing instructions covering some of the problems of painting and how white lead meets these problems.

PAINTING YOUR HOUSE by Dr. F. L. Browne, Senior Chemist, Forests Products Laboratory, Madison, Wisc.

A discussion of house painting reprinted from American Forests, May, 1939.

SOME PAINTING PROBLEMS AND THE ANSWERS

By Dr. F. L. Browne, Senior Chemist, Forests Products Laboratory, Madison, Wisc.

Reprinted from the National Real Estate Journal, Sept., 1939.

STAMFORD'S DOUBLE LIFETIME HOME

A complete analysis of hard lead flashing, white lead paint, lead plumbing, plywood and red cedar Certigrade shingle details and installation methods. Reprinted from the American Builder, July, 1939.

SHEET LEAD INSTALLATION DETAILS

A detailed analysis of the principles and application of lead flashing and sheet lead work for small homes. Reprinted from Sheet Metal Worker, June, 1939.

DON'T GAMBLE WITH PAINT

An instructive article on the selection of paint for farm use reprinted from the March 1942 issue of Country Gentleman.

BRUSH UP ON YOUR PAINTING

A practical article on the selection and application of paint reprinted from House Beautiful, June, 1941.

HOW LUMBER AND PAINT KEEP YOUR HOME ALWAYS IN STYLE

A brief digest of the advantages of painted lumber homes with color-styling suggestions and other interesting information.

LASTING LEADWORK IN MODERN PLUMBING

By T. N. Thompson, Technical Editor, Plumbing and Heating Journal.

Reprinted from Plumbing and Heating Journal, Feb., 1939.

COMMERCIAL STANDARDS:

Calking Lead, CS94-41

Lead Pipe, CS95-41

Lead Traps and Bends, CS96-41

Official publications by the Government Printing Office of the above Commercial Standards as promulgated by the U. S. Department of Commerce through the National Bureau of Standards, effective June 25, 1941.

WHITE LEAD PAINT FOR DEFENSE HOUSING

Reprint from Bulletin of the Producers' Council including specifications and graphic mixing instructions for exterior and interior White Lead Paint.

LEAD PLUMBING FOR DEFENSE HOUSING

Reprint from Bulletin of the Producers' Council including information on the Emergency Plumbing Standards and the Defense Housing Critical List.

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Usefulness of Old Homes Prolonged With White Lead Paint

EVERY building, whether residence or factory, that can be used in its present form or altered and improved, saves both critical material and labor which must be devoted to winning the war. White lead paint can in many cases help change drab, neglected houses into pleasant serviceable habitations for war workers.

There are many large old houses in war industry areas which can be changed, with slight alterations, into multiple unit habitations. In many cases, extensive repairs to exterior finish is not advisable, but buildings which are threatened with rapid deterioration because of neglect may have their useful life prolonged many years by the use of white lead paint. Some of the ways that white lead paint can serve in this manner are discussed in the following paragraphs.

Masonry

Many fine old houses, built of brick with stone trim, both of which were slightly absorbent, will show a tendency to spall, or flake off, in either or both materials. This is often caused by the freezing of absorbed water which, expanding, breaks down the structure of the material and forces flakes to fall off. Pure white lead paint applied to such a surface seals it against water penetration and prevents further destruction. The paint will also have a tendency to seal the wall against leaks through the mortar joints, thus protecting interior finishes.

Metal Work and Roofs

Exterior metal work should be thoroughly inspected and checked for structural soundness before painting. If neglect has not resulted in an unsafe condition, thorough cleaning and

painting with a prime coat of red lead paint and finish coats of white lead will prolong its useful life for years.

It is not good practice to try to stop roof leaks with even white or red lead paint, but an old tin roof which is still sound can be kept so for additional years by a protective coat of red lead paint.

Wood

Wood occupies an important place in most old residence buildings. Wood serves so well that it is subject to long periods of neglect. Wood can be unsound and still present a reasonably good appearance, so it should be carefully inspected before painting. Open joints do not mean that wood is seriously damaged but they are danger points that should receive special attention. This is especially true where the open joint exposes end grain. Thorough saturating and sealing of such joints with white lead paint will prevent the entrance of water which would shorten the life of the material. Danger points are butt joints such as siding to corner boards, exterior window trim at head and sill, mitre joints and bottoms of porch posts. Top and bottom edges of doors should also be given attention.

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Wood sash needs extra care in old buildings. All joints in muntins (the bars between the glass panes), top and bottom of side rails and the putty should be carefully painted and sealed. Broken or damaged putty should be removed and replaced with white lead putty composed of white lead paste with enough bolted whiting to bring it to working consistency. Avoid getting paint on the glass or the window cleaner will have to remove it with a razor blade. This breaks the seal at the edge of the putty and may allow water to seep in between glass and putty.

Countless other ways will be found to use white lead in prolonging the life of an old building, subject only to the ingenuity of the workman, and every case will result in an improvement in the appearance as well.

WPB Approves

One of the important advantages of preservation by a white lead paint program is that it can be done without interfering with vital war department orders. "The War Production Board recently announced that under the terms of Conservation Order L-41 it is not necessary to obtain specific authorization for repainting and redecorating work when they constitute 'maintenance' or 'repair'." . . . "The WPB order makes allowances for ordinary repair and maintenance work to return a structure to sound working condition as long as there is no change of the design or the structure."

The above quotations are from the Federal Housing Administration Clip Sheet issued July 3, 1942 and indicate clearly the favorable attitude of the WPB toward action to rehabilitate old buildings. The materials for pure white lead paint in ample quantities are available for this sort of work without danger of creating shortages of lead for war industries.