

**PRACTICAL
PAINTING**

C. T. F. 1909

Practical Painting

AND

HOW TO USE

The Heath & Milligan Prints

COMPILED BY

A. M. HEATH and J. B. CAMPBELL

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PREFACE.

The foundation upon which the painter of to-day must conduct his work in order to reap the greatest profit is practical knowledge. He cannot go about his efforts disregarding facts which require his most careful consideration in order to produce satisfactory results. There are certain principles and laws which must be followed in all work pertaining to painting, but these by no means constitute every point to which the painter must look if he desires to build a reputation on high class work.

Painting of to-day is a radically different proposition from what it was twenty or twenty-five years ago, and the same rules which governed work of that period by no means apply to the work of today. Conditions have changed, and the successful painter is the man who understands present-day requirements and shapes his work to meet these new demands.

Advanced conditions have worked many a new problem for the painter and paint manufacturer. The vast consumption of White Pine and Poplar, practically the only two woods which were used for building purposes some twenty or twenty-five years ago, is far in excess of the production and supply, which fact has led to the use of between twenty and thirty different woods, each necessitating a different treatment in painting. This is only one of the modern problems which the painter has to handle.

The vast consumption of building timber demands a mechanical process for drying and seasoning, because nature's process is too slow, and with relying on nature the supply would fall short of the demand. The product of the mechanical process is far different than that of nature, and requires a much different treatment in painting than the old-fashioned nature seasoned and dried lumber.

Demand has done still more. It has forced the cutting

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of trees at all seasons of the year, and practical experiment has taught that lumber from a tree which has been cut in winter is vastly different from lumber of a tree which has been cut in summer. In winter the sap is down; in summer it is up. Thus a building entirely constructed of the same kind of wood requires on the sappy parts certain treatment in the painting, while on the other parts a much different treatment; or, at least, these facts must be taken into consideration and a uniform treatment planned which will best satisfy both conditions.

It is often the case that on a frame building constructed in this age there have been three or four different kinds of lumber used. The siding may be of Yellow Pine, the corner boards and cornices of Cedar or Poplar, and the mill work, such as frames, sash, columns, etc., of whatever the manufacturer can buy the cheapest, covered with a worthless primer to hide the defects. The painting of such a building requires a thorough knowledge of the class of paint treatment all of these different woods demand and is certainly a difficult class of work to handle.

Some woods absorb paint readily, others only moderately, while still others do not absorb at all unless forced to do so through certain reductions of the paint.

Another point to consider is the different drying properties of the different woods, some of which are natural dryers and assist the paint in hardening, while others work just the opposite.

The seasoning process to which lumber has been subjected also plays an important part in the resulting character of the wood.

If kiln-drying is too rapid the lumber may be case hardened, in which instance it is liable to check badly, and if too great heat is applied the fiber is of course injured and the strength reduced accordingly.

There is much kiln-dried lumber used, and a good percentage of it has been subjected to too rapid a drying process, where, on the other hand, air-dried lumber has no opportunity to lose any of its physical strength or toughness; thus, the surface of a building all constructed of the same species of lumber may vary as much as though constructed of two or more lumbers of widely different character.

Often we find lumber which has both hard and soft

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streaks in it, and if you will carefully watch the drying process of the priming coat which has been applied to it, you will note that on the hard streaks the primer will set on the surface and continue tacky for days and days, and for that matter may never thoroughly dry in; where, on the soft streaks the primer has penetrated and dried, within a very short period of time. This class of surface is most difficult to treat, and it is almost next to an impossibility to produce an absolutely satisfactory result in connection with it.

The foregoing are not all of the difficulties with which the paint manufacturer and painter have to contend, but they serve to demonstrate that on the priming coat depends satisfactory or unsatisfactory results of the finished job; they further illustrate how impracticable it is to disregard the conditions of the surfaces to which the paint is to be applied. To overlook this point is like disregarding the importance of a foundation to a building and considering only the part exposed to view. Sooner or later the building is most likely to tumble likewise with a good paint over a surface which has not been carefully considered before the priming coat was applied, or over a poor primer, and even over a good primer that has been improperly applied.

With all of these conditions confronting the paint manufacturer and painter, it is not remarkable that the opinion of many should be in the direction that paint of to-day is not on a par with that of twenty years ago, when conditions were the same on every building and all work successfully done by following a few set rules. But when one studies all of these present-day conditions and sums up the many obstacles confronting the painting fraternity, he conceives it marvelous that any satisfactory results whatsoever are accomplished.

By placing the reader in touch with these conditions, he is made familiar with the great value of this book, which deals with the many different woods used for exterior building in the United States, covers their different characteristics, their varied susceptibilities to paint, and outlines in brief in connection with each wood the only practical reduction for priming coats which will produce satisfactory results in the finished job.

This work has been accomplished through having canvassed the country north, east, south and west, and obtain-

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ing every bit of practical information possible relative to the different humbers used for exterior building, and after having obtained all of this knowledge, much practical experience with these different humbers was conducted in order to ascertain their many peculiarities relative to absorption, drying properties, susceptibility to paint and variance in grain. Although each day in the many humbers spent in connection with these experiments produced new problems, however, embodied in this book is an abundance of practical knowledge which cannot help but aid in every possible way those who make their livelihood through the mediums of brushes, oils and paints.

Not alone does this book deal with the different woods used for building, but it covers in a most comprehensive manner every feature which enters into the work of the painter and gives him the key to every practical point pertaining to his vocation, outlining the proper methods to pursue in order to insure progress and success. It has not been with any selfish motive in view that this work has been undertaken, but more with the hope that through imparting this knowledge much assistance would be lent in the direction of establishing a better condition in the field of painting and also set right the many false impressions regarding the inferiority of present-day paint as compared with the old-fashioned product which could not possibly fill present-day requirements. Especially is this book intended to teach the fundamental and detailed methods of painting and to give the man who uses the brush a line of new ideas which will keep him at the top of his vocation.

It may not be advisable to try and digest at one time all of the information given in this book, but take it piece by piece, and as you thoroughly familiarize yourself with each individual part, apply this one feature to your work—then look for results.

It is to be hoped that the knowledge you acquire in the reading of this book will work to your profit in every possible way and through such knowledge you may "help establish better conditions in painting," the object which prompted the effort spent on this book of vast information.

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HOW TO MEASURE OR ESTIMATE A SURFACE TO BE PAINTED.

EXTERIOR WORK.

To correctly estimate, one must know that 100 square feet and that a square yard is 9 square feet. He must then obtain the actual dimensions of the surface to be painted. He must know how many square feet there are in the work, the condition of the surface and the amount of material required to do the work, whether one, two or three coats. He must know on which part of the work he has to have to double and treble measure; that is, where he must be measured two or three times to arrive at the correct amount of time necessary to paint it. After he has taken all these points into consideration he is ready to make an estimate; however, all rules for measuring a surface to be painted will fall short of the desired result if the rule of measurement is not used. No definite rules can be furnished which will give a basis for arriving at the exact amount of material necessary on work which is difficult to handle. In such cases extra ladders, staging or scaffolding. Should the estimator misfigure, he will either lose money or lose the business.

How to Measure or Estimate a Surface to be Painted, Exterior Work—Continued.

To measure a building, take a tape line and begin at one corner of the building, measuring all of the same height together; multiply this by the height of the building, commencing at the outer edge of the cornice and running to the lower edge of the baseboard, adding 1 to $1\frac{1}{2}$ feet to the height for the edges of weatherboarding. This will give the number of square feet in the building.

To measure a gable, take the length of rafters, multiply by $\frac{1}{2}$ of the height from the square to peak or comb of the roof. This will give the number of square feet in any gable.

This is all called plain work when painting and no extra measurements are allowed for two or three story work. Above three stories, one-half extra measurements are allowed. Wall work measure solid, no windows or doors deducted.

Stave or wainscoting cornices— $1\frac{1}{2}$ measurement.

Singlet gables— $1\frac{1}{2}$ to double measurement.

Dormer windows— $1\frac{1}{2}$ to double measurement.

Dimension shingles cut— $1\frac{1}{2}$ to double measurement.

Dimension shingles dressed—single measurement.

Dimension shingles cut, undressed— $1\frac{1}{2}$ to double measurements, according to the amount of work.

Spindle work, turned—measured solid on both sides.

Shingle work and pickets, square—3 measurements.

Veranda railings and columns—measured solid.

Veranda ceilings, beaded and rafter finish—double measurements.

Verandas, plain—measure floor and ceiling, allowing for the brackets and columns.

Verandas that have heavy columns and rails—measure floor, ceiling and the entire veranda solid.

Columns, rails, lattice and turned work—double measurement.

More elaborate scroll or ornamental work; also square spindle work, close set—triple measure.

Outside blinds—3 measurements, usually done by the pair.

Lattice work— $2\frac{1}{2}$ to 3 measurements.

Picket fence—3 measurements.

Another system for measuring verandas which is considered one of the most difficult by a great many painters is to measure the floor and ceiling solid, then meas-

How to Measure or Estimate a Surface to be Painted, Exterior Work—Continued.

ure around the veranda the same as in measuring the building, taking the height around over cornices to the lower edge of base or lattice work, and double this measurement if many brackets or much scroll work.

ROOF WORK.

Roofs are measured solid except coping, which is extra if painted a different color.

INSIDE MEASUREMENTS.

Inside work is measured solid on both doors and windows, with three inches allowed on each square opening for tracing edges; base never less than one foot. Stair, rail and balustrade, three times.

WALL WORK.

With wall work, where the doors and windows are painted, one-half to two-thirds of the openings is deducted; where the openings are not painted, one-third is deducted; cupboards and pantry shelves, $1\frac{1}{2}$ measurement.

Floors measured solid—plain work.

CONSIDERATION OF SURFACE.

NEW WORK.

In figuring a piece of work, the consideration of the surface to be painted is of as much importance as measurements. There are certain humbers used for exterior building which cannot with safety, to produce satisfactory results, be finished with two coats of paint, owing principally to the great absorption of the lumber, as well as its varied grain, ranging from dark to light. If the paint is mixed heavy enough to cover the dark grain the lumber will not be satisfied, and while a single painting may show satisfactory results, it will not sufficiently penetrate nor bind to withstand contraction of future coats, thus causing the paint to break from the surface.

Upon the reputation of a painter depends his success. His reputation is his principal stock in trade and should not be jeopardized by doing work against his judgment. If an architect, contractor or property owner has specified two coat work without consideration of the surface, and three

How to Measure or Estimate a Surface to be Painted, Exterior Work Continued.

coats are necessary, an explanation as to the resulting danger through such should be given him. If his views can not be changed, don't try to hide the surface by plastering on the paint, but apply two properly reduced and brushed out coats, remembering the surface must be satisfied even at the expense of hiding. It is much better for all concerned to have the lumber satisfied, thus leaving a good foundation for subsequent paint coats, even though a surface may be left which will soon show signs of wear under weather exposure through not having sufficient pigment to form protection, than to apply heavy coats which will not properly penetrate nor bind and with future coats soon break away, leaving a surface which will always be a treacherous one to paint no matter how much judgment may be used in future painting.

OLD WORK.

The value of a practical painter is his practical knowledge in knowing how to treat or repaint a surface in order to produce the best results, no matter in what condition the surface may be. It is impossible to give definite instructions regarding old work, as conditions are too varied, but there are a number of important points which should be carefully considered in figuring on this work. In appearance the building may be in first-class condition and apparently only need freshening up. Examine the surface carefully and determine whether the foundation coat is properly bound to the surface. Do not be responsible for some one else's careless work in not having properly satisfied the surface, thus not leaving a foundation to which subsequent coats can be applied with satisfactory results. If you work over such a surface, you are the one who will be blamed, as invariably the statement is made that the building was in good condition before the last coat of paint was applied. Don't hesitate under such conditions to recommend that the building stand for a longer period before repainting, or, the application of but one coat of paint so mixed that it will penetrate through the old coating and into the original surface.

Never apply two coats of paint to an old surface when one coat properly reduced will answer the purpose. There is as much danger in applying too much paint as too little.

PRACTICAL PAINTING.

How to Measure or Estimate a Surface to be Painted, Exterior Work Continued.

Repeated heavy coats of paint, while they may be well bound together, and to the surface, under contraction and expansion may break loose either from the surface, or one coat from another, this depending upon the thickness of coats and depth of penetration of priming and elastic finishing coats.

If the surface is cracked, checked or peeled, carefully consider in figuring whether scraping will produce a satisfactory foundation or whether burning of the surface is necessary; also whether an extra coat must be applied to even up the surface in parts in order to leave a proper foundation for finishing coats.

WHEN NOT TO PAINT.

There are certain times of the year when outside painting should not be done if satisfactory results are to be expected. If painting is done too early in the spring, the surface is very apt to be full of frost and moisture and the pores closed through contraction, thus producing uneven absorption. The side of the building exposed to the heat of the sun will expand and the pores open to a greater extent than the protected side of the building. All paints and oils are much heavier in cold than in warm weather, and if applied under a low temperature there is apt to be too heavy a coat over a contracted surface, which will crack through expansion under the summer heat.

Do not paint after a frost or in early spring when frost is leaving the ground, filling every part of the building with dampness. Remember that heat ascends and brings the dampness with it.

Paint should never be applied to extremely hot surfaces. Paint applied under extreme heat sets and dries very rapidly, and under the direct heat of the sun's rays is very apt to blister, especially on old work. Remember that tins absorb while white reflects heat, and when it is too hot to paint with white, remember it is also too hot to paint with tints. This should not be taken as an argument against summer painting, but only as a caution against working on extremely hot surfaces.

In spring painting follow the sun with your work. In summer painting let the sun follow you. Switch your work according to the time of the day.

Do not paint while the plaster is drying out; allow time for it to harden through. Remember there are 80 to 90 gallons of water used in every 100 yards of plastering, most of which must escape some place. If the building is tightly closed or is being dried by heat, the moisture will be largely driven out through the siding, causing the paint to break away, blister or peel.

Do not paint buildings having damp basements without first removing the cellar windows and ventilators so as to have a free circulation of air, thus drying out the under part of the building; otherwise the dampness will go up through the house between the siding and plastered wall and be attracted to the surface through the siding.

Do not paint near fresh mortar beds. The heat, mois-

When Not to Paint--Continued.

ture and fumes from the lime will be absorbed by the oil in drying, causing it to flatten out and destroying its life.

Do not paint in sultry weather or in a heavy, wet atmosphere, as the moisture from such conditions penetrates the surface to an extent that it takes several days of good drying weather for the building to again be in condition to receive paint.

Do not paint during or immediately after a heavy fog or dew. In a few hours lumber absorbs more dampness in this kind of weather than from heavy rains. Moisture from heavy fogs and dews penetrates lumber to a greater depth than from any other source. It is especially important to guard against these conditions.

In most sections of the country the season of exterior painting is comparatively short and it is a great temptation for painters who have been obliged to lie idle all winter to start early spring painting. The season of painting can be easily extended and more satisfactory results obtained by using judgment as to the best time of the year to paint a building according to its surroundings. There are very few property owners who would not be willing to extend the time of painting if shown that better and more satisfactory results can be obtained by so doing.

A building exposed to the sun and weather on all sides will dry out much quicker and be in condition to paint much earlier in the spring than one in a confined space where the sides of the building are not exposed to the sun or have no opportunity to dry out before the summer weather arrives.

A building surrounded by vines or dense foliage is in no condition to paint until the heat of the summer has drawn the moisture, not alone from the building but the ground surrounding it. The building may be so densely shaded that it will be palatable only at a time of the year when it would be impossible to apply paint to an exposed surface without danger of its blistering under the extreme heat of the sun.

Under certain conditions, better results will be obtained on a surface which is checked, cracked or shows indications of peeling, by allowing the building to stand through the summer and deteriorate to the full extent, repainting in the fall when the old, loose surface can more easily be removed.

GOOD WORK CAN NOT BE DONE WITH POOR TOOLS.

It is false economy to work with poor or cheap brushes.

A good painter can not do good work, or the amount of work he should, with poor tools.

Your time is money and time is lost by trying to paint with a cheap stock brush.

It is a mistake to try to work half-handed or with too few brushes.

The kit should consist of a good full stock body brush for each color, the size depending upon the width of the siding to be painted (3½ to 4 inches long stock brush is the one usually used); a full stock trimming brush, well broken in (There is no economy in using a half worn out body brush for trimming colors. A good trimming brush is just as essential as a good body brush, as it is impossible to cut in on cornices, corner boards and window and sash frames with a ragged edged brush); a good chiseled sash tool or a 1 inch or 1½ inch flat chiseled varnish brush for brackets, mouldings, etc., also a ½ inch flat chiseled varnish brush for sash colors, a good duster and putty and scraping knife. This completes an ordinary kit of tools and is sufficient to do good work. It is not economy to attempt to work with less.

CARE OF TOOLS.

Never put new brushes into water. When through with the day's work, lay them out smoothly full of paint on a board; repeat this for several days, or, until the brush is thoroughly broken in; then keep it in a brush trough. Do not stand brushes on end or keep them in the paint.

Never let brushes become lousy through allowing paint to dry or skin around the bristles or handles. Should the brushes become hard by being neglected, they can soon be cleaned by putting them in a liquid paint and varnish remover. After a few hours brush out on a rough board; then thoroughly clean the bristles with benzine or turpentine. This will not injure brushes of the finest quality.

Always use a brush in a manner so as to wear the bristles to a chiseled point.

Never jam a brush into a corner, thereby making stubby tools. Work it into the corner in place of jamming it in.

THE LUMBER. NEW WORK.

The consideration of the character and condition of the surface is the most important factor in the work. The kind of lumber used in the construction of the building should be carefully studied. Determine whether hard open grain or hard close grain; soft close grain or very soft open grain; soft and spongy; compact or solid, also whether it is kiln or air dried lumber; if kiln dried, and the drying process has been carried on too rapidly the wood may have become case hardened, leaving it more brittle and lifeless. Thus having lost part of its vitality or physical strength, the paint must be mixed to a consistency which will penetrate to a depth that will insure satisfactory results. If the paint is heavy in consistency and lies on the surface, the fibres of the wood will break away through contraction and expansion, bringing the paint with it. This trouble is always laid to the paint, while the true cause is that the priming coat was not properly reduced when applied, so as to penetrate to a sufficient depth to insure proper binding.

Wood that has been air seasoned has had little or no opportunity to lose any of its strength or vitality, and will hold paint well if properly reduced and thoroughly brushed into the grain.

It is impossible to have all of a building constructed of lumber from the same tree and boards of the same physical strength. Part of the lumber may be kiln-dried and case hardened; part air dried; part may have been cut in winter when the sap was down and part in summer when the sap was up.

While it is not practical to have separate mixes of paint for the different characters of lumber in the same building, IT IS POSSIBLE, PRACTICAL AND NECESSARY to examine the work to be painted and note its characteristics as to absorption of oil and drying qualities, also the condition of the lumber, whether old, discolored and partly decayed from lying in log too long before cutting or in some damp place after it had been cut into lumber. Carefully consider whether two or three coats are necessary to produce satisfactory results.

It is impossible to do satisfactory two coat work on certain lumber. A priming coat mixed heavy enough to assist in hiding the dark spots or grain will not contain suf-

The Lumber, New Work Continued.
efficient oil or thinners to fully satisfy the wood, and the wood will soon rob the paint of its oil or binder. The priming coat being applied heavy will not allow of sufficient penetration of the second or finishing coat to assist in supplying the wood with ample oil to hold the paint to the surface, thus resulting in the paint breaking loose in scales, elastic on the outside and lifeless on the side next to the wood.

The following treatise on the principal woods used for exterior building throughout the United States has been based on practical experiments in connection with the action of paint on these different lumbers. Lumber of the same class varies in character to such a degree that the information given has had to be based on normal conditions, viz.: the average run of lumber in quality, grain, sap and dryness.



White Pine.

WHITE PINE.

This was formerly the chief lumber of the States. The supply, however, is rapidly diminishing, prized because of its combination of strength, elasticity and working qualities. It is softer than most woods, and it stands at present with iron as much as iron does to metal.

A soft, close grained wood, seasons well and is free from shrinkage, has good absorbing qualities and readily takes paint on account of its even, uniform grain.

For priming, the reduction should be to a medium consistency, carrying enough turpentine to assist in penetration and working. The priming coat should be applied with a full brush, well and evenly brushed out. Time must be given for thorough hardening.

While paint dries well on this surface, the lumber is subject to occasional pitch pockets into which paint penetrates slowly. Over the sap and pitch pockets paint dries poorly, and unless ample time is given for thorough drying over these places, the paint will break loose in a relatively short time after the priming coat has been applied. These pitch pockets are easily detected by the coat. Don't paint over such places until thoroughly dry.

Owing to the even, uniform grain and color of white pine, satisfactory two coat work can be done over the first.



Poplar.

POPLAR.

In some localities known as Tulip Tree wood, White wood and Yellow Poplar.

Used extensively for exterior building.

The wood is soft, stiff, clear, fine and straight grained and stands among trees of broad-leaf series as White Pine does among the Conifers.

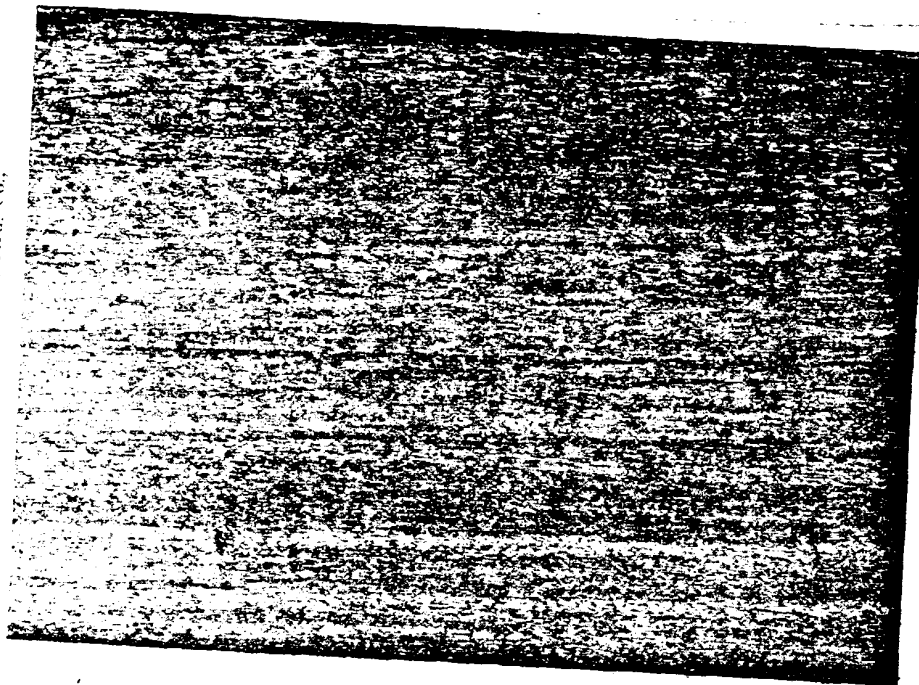
A soft, close-grained wood seasons well, moderately strong and shrinks but little, has good absorbing qualities and is one of the most satisfactory woods for painting.

The priming coat for this lumber should be reduced to a medium thin consistency, carrying enough turpentine to assist penetration and working of the paint.

The priming coat should be applied with a medium full brush and be well and evenly brushed out.

Paint dries well on this lumber.

If free from dark, hard streaks, satisfactory two coat work can be done. This point should be carefully considered before starting the work.



Cottonwood.

COTTONWOOD.

Greatly valued in the manufacture of paper pulp.

Often substituted for Whitewood, but less desirable. A close-grained wood, compact structure, sapwood nearly white, heartwood dark brown. It is light, weak, liable to warp and difficult to season. When well seasoned has good absorbing qualities and takes paint readily.

Being of a soft, spongy nature, it absorbs moisture rapidly and if allowed to weather will soon mould, turn dark and decay on the surface, leaving a dangerous grain over which to apply paint, inasmuch as it has no strength or vitality. The paint will soon break loose and the primer will bring the fiber or decayed wood with it.

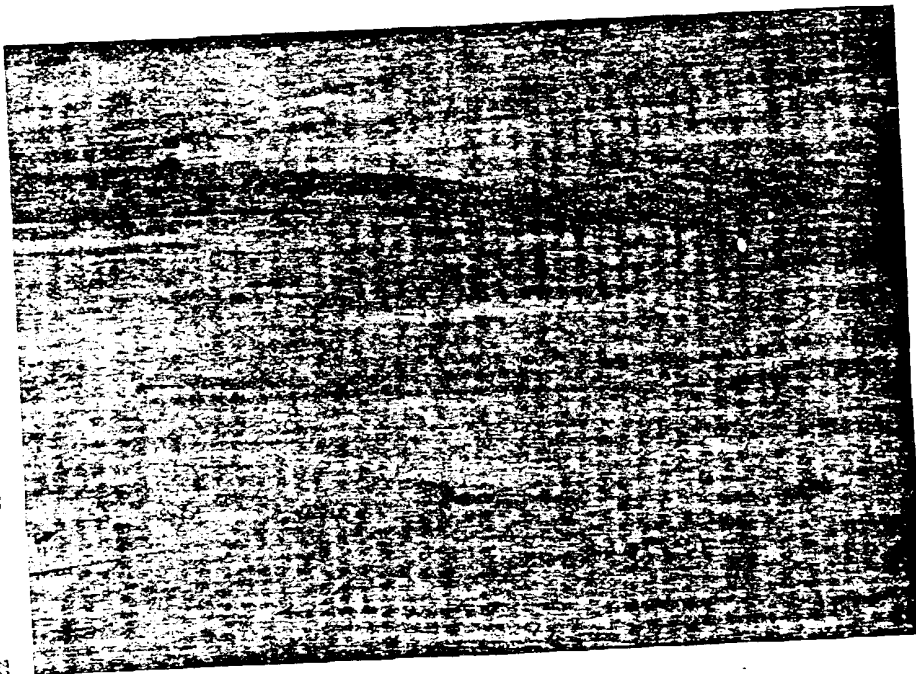
It is subject to dry rot, and if paint is applied over this wood when containing dampness, dry rot will set in from the back of the boards.

For priming coat the paint should be thin and elastic so as not to set up quickly, thus allowing time for the wood to be fully satisfied.

The priming coat should be applied with a full brush and be well and evenly brushed out.

The drying process is medium slow and ample time must be given for thorough hardening of all undercoats.

Owing to the light grain of this lumber, satisfactory two coat work can be done.



Basswood.

BASSWOOD.

Known in some localities as Linn or Linden. It is becoming more generally used for exterior building.

Very straight, close grained and of compact structure.

It is light, soft and tough, but not durable. Not difficult to season.

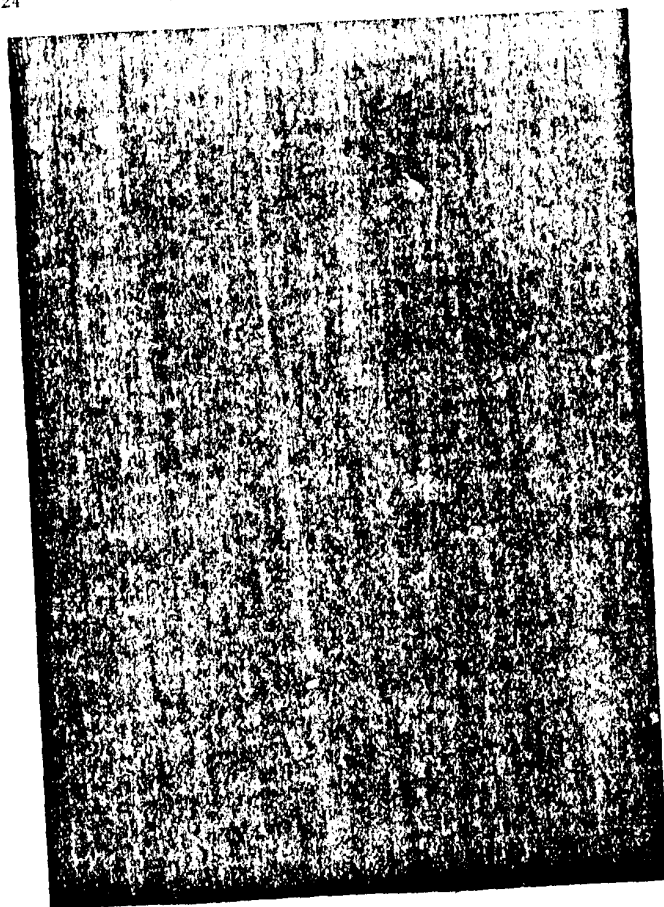
A soft, close grained wood of medium absorbing qualities, takes paint readily.

On account of its compact structure, the primer should be mixed thin and elastic, so as not to set up quickly and to allow time for the wood to be fully satisfied.

The priming coat should be applied with a full brush and be well and evenly brushed out.

Paint dries well on this lumber.

Owing to the color as well as the grain of the wood, satisfactory two coat work can be done over this lumber.



Gum.

GUM.

Not durable when exposed. Shrinks and warps in seasoning. However, it is used in some localities for exterior painting.

Although heavy, it is rather soft but strong, cross grained.

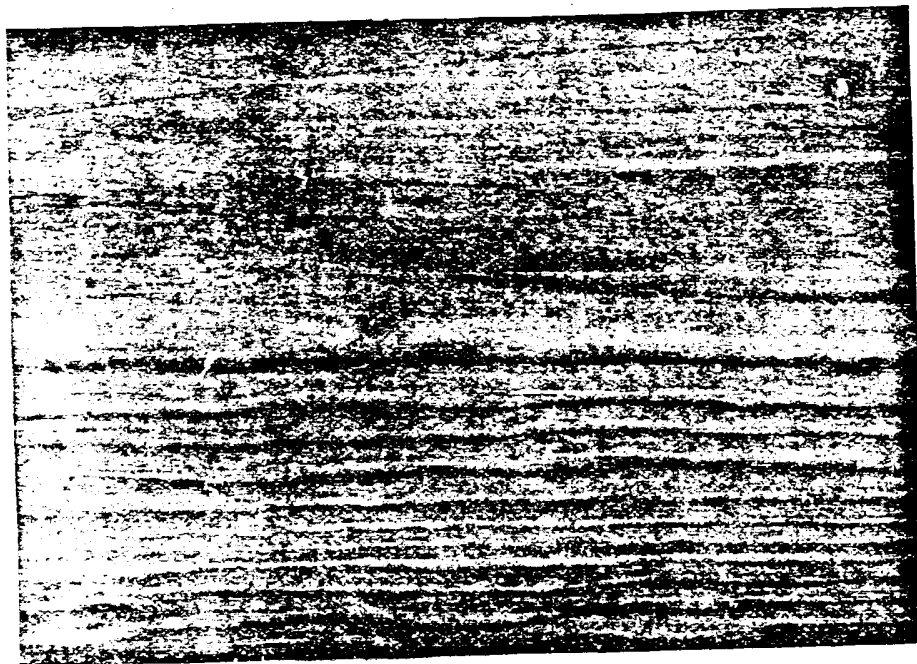
A soft, close grained wood, medium slow to dry, well seasoned, takes paint readily.

On account of its being slow to absorb, the paint should be mixed to a thin consistency with a full quantity, carrying sufficient turpentine to assist in penetration and working.

The priming coat should be applied with a full brush, be well and evenly brushed out.

Ample time must be given for thorough drying and absorption, as paint dries very slowly on this lumber.

If selected lumber and free from dark streaks, factory two coat work can be done.



Spruce.

SPRUCE.

Resembles and often substituted for White Pine.

A light, soft, straight and close-grained wood with occasional pitch pockets. Apt to warp and twist in seasoning.

Although a soft, medium close-grained wood, it does not absorb a heavy paint and the primer should be mixed to a thin consistency, carrying a liberal amount of turpentine to assist in penetration.

The priming coat should be applied with a full brush, be well and evenly brushed out and ample time given for thorough absorption and drying.

This lumber is liable to run to heavy growth, which point must be considered in the reduction of the primer and turpentine used according to this condition, to not only insure better penetration but more even covering.

If selected lumber, satisfactory two coat work can be done, but where it runs to heavy growth two coat work should not be considered, as it is impossible to cover such a surface without danger of priming coats being too heavy.



White Cedar.

WHITE CEDAR.

White Cedar (*Chamaecyparis Thyoides* L.), grown from Maine to Florida and from the Gulf Coast to the Mississippi. At its best in Virginia and North Carolina. Is used quite extensively for exterior building.

It is light, brittle, soft and durable, close-grained and of compact structure; sapwood light; heartwood brownish. If well seasoned, it absorbs very rapidly and uniformly. If properly treated, it should not be a hard lumber to paint.

The White or Port Orford Cedar of Oregon is used in a limited way for exterior building, its principal use, however, being for interior finishing and the manufacture of matches. It is light, hard, strong and very close-grained. The heartwood and sapwood are similar in color, running to a yellowish white throughout. It is more resinous than the Eastern White Cedar and more turpentine should be used in the reduction; otherwise the same information fully covers all classes of White Cedar.

The lumber should be thoroughly dry and well seasoned before being primed. Care must be taken to fully satisfy the surface with the priming coat, remembering that a great deal of oil is necessary in the primer.

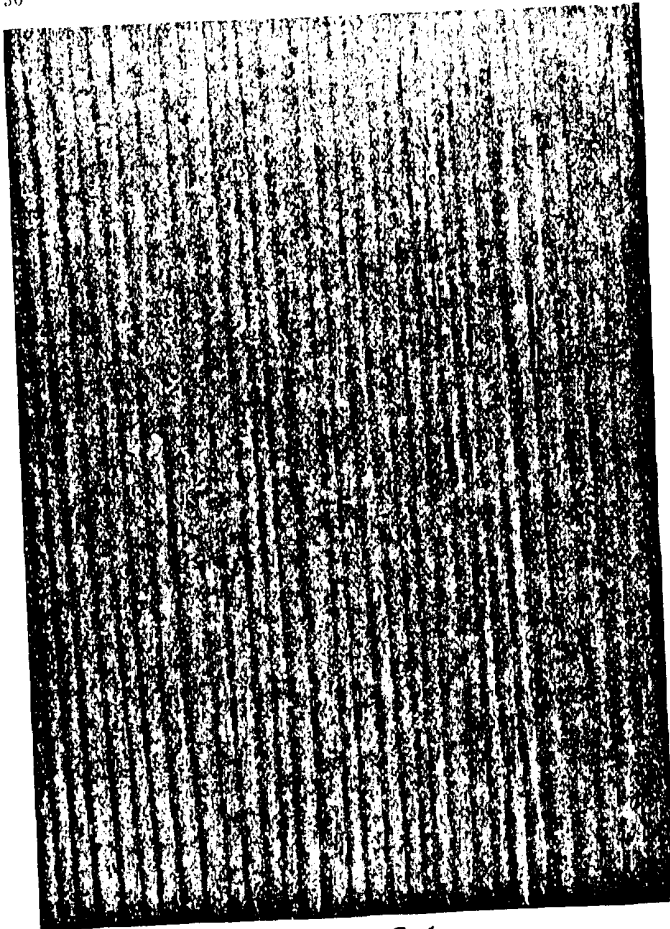
The primer should be mixed to a very thin consistency with a full oil reduction, carrying sufficient turpentine to assist in penetration and working.

The priming coat should be applied with a full brush and be well and evenly brushed out.

Ample time must be given for thorough hardening, as it requires considerable time for paint to dry on this surface.

Owing to its great absorbing qualities, two coat work will not produce satisfactory results over this lumber, as it requires thin coats to fully satisfy the surface.

The middle or second coat should be reduced to a medium thin consistency.



California Cedar.

CALIFORNIA AND OREGON CEDAR

Used extensively for exterior building. While different sections of the country, their character and both should have the same treatment when

Light, hard, strong and durable. While natural qualities, they are very soft, close-grained of very rapid absorption. If proper care is taken in preparing the primer, the lumber will take the paint

The primer should be mixed to a very thin consistency with a full oil reduction, carrying enough turpentine to assist in penetration and working.

The priming coat should be applied with a brush and be well and evenly brushed out.

Owing to the large amount of oil necessary to satisfy this lumber, drying is slow and ample time should be given for thorough hardening.

Two coat work can not be recommended, as three coats are necessary to fully satisfy the surface.

RED CEDAR.

Although a light, soft, weak wood, it is used in some localities for exterior building.

A close even grained wood of compact structure, running from dull red heartwood to nearly white sapwood.

While not resinous, it is from the Red Cedar (*Juniperus Virginiana*) that Oil of Cedar is obtained. This is a great paint solvent and unless the lumber has been kiln dried or thoroughly seasoned, this solvent will act on the primer and destroy the binder.

While classed as a soft wood, it is of medium slow absorption.

The primer should be mixed to a very thin consistency with a liberal amount of turpentine to assist in forcing penetration.

The priming coat should be applied with a medium full brush and be well and evenly brushed out.

Ample time must be given for drying.

Owing to the character as well as varied color of this wood, satisfactory two coat work can not be done. Thin coats must be applied to fully satisfy the surface and ample time allowed for absorption and drying.

Extreme care must be exercised in brushing the primer, so as not to have an excess of paint on the surface.



Michigan Red Cedar.



Washington Cedar.

WASHINGTON CEDAR.

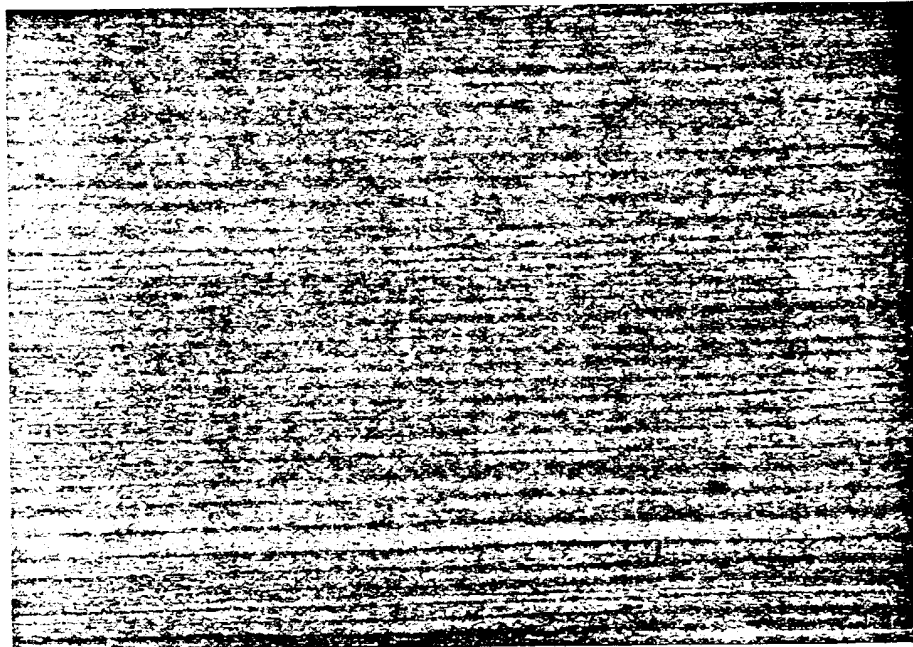
A light, soft wood, very close-grained and of compact structure. While classed as a soft, very close grained wood, it varies from soft to hard-grained, giving an uneven absorption, the softer grain absorbing rapidly, while the harder grain absorbs slowly.

The primer should be mixed to a very thin consistency with a liberal amount of turpentine to assist in penetration on the harder grain, as well as ease of working.

The priming coat should be applied with a full brush and be well and evenly brushed out.

Ample time must be given for thorough hardening, as the paint dries unevenly on this surface, the drying process on the soft grain being good, while on the hard grain the paint dries very slowly.

This is a hard lumber to paint and two coat work can not be recommended. It should receive three thin coats of carefully brushed paint to insure satisfactory work. Extreme care must be exercised in preparing and applying the primer.



California Redwood.

REDWOOD.

Used extensively for exterior building and a most satisfactory lumber for painting if its characteristics are understood.

Light, very soft, durable lumber, not resinous, easily seasoned, of coarse straight grain and compact structure, absorbs paint rapidly.

The primer should be mixed to a very thin consistency with a full oil reduction, carrying enough turpentine to assist in penetration and working.

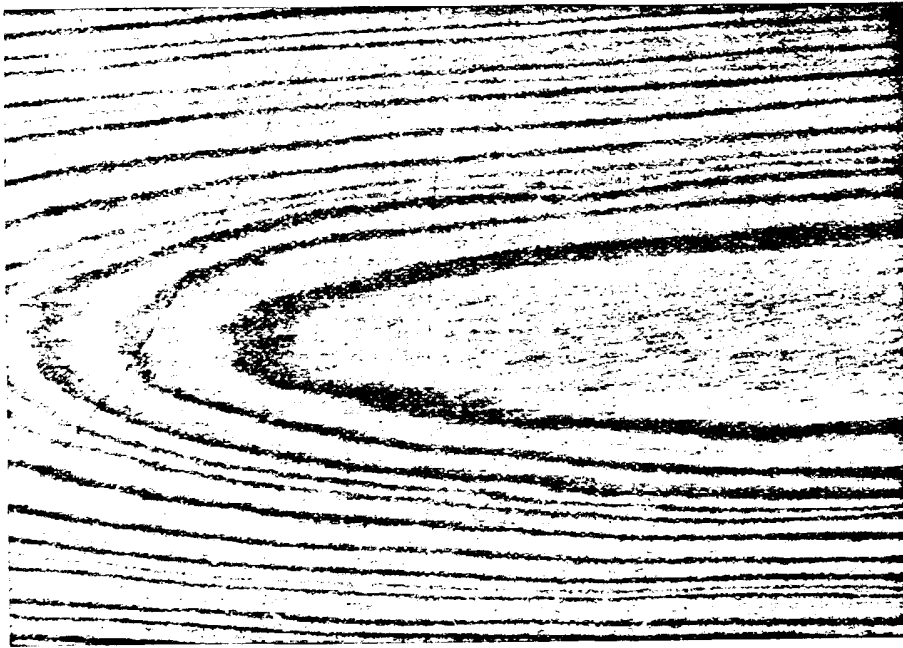
The priming coat should be applied with a full brush and be well and evenly brushed out.

Ample time must be given for thorough drying and absorption.

Being dark in color, satisfactory two coat work can not be done on this lumber, as the priming coat must be mixed extremely thin to fully satisfy the surface.

Middle coats should be reduced to a medium thin consistency. In order to satisfy the surface, do not apply heavy coats over this lumber. This wood absorbs rapidly and to a good depth.

Heavy coats will cause peeling, as the wood will absorb the oil from the pigment.



Cypress.

CYPRESS.

A swamp growth, and when green is very heavy. If well seasoned, it is very light and very durable. A close straight grained wood with brownish heartwood and nearly white sapwood. A most difficult lumber to paint unless its characteristics are understood. It is of medium slow absorption and like with cedars, which this lumber very much resembles, careful attention must be given to the priming coat in order to fully satisfy the surface. The primer should be mixed to a thin consistency; at least 20 per cent of the total amount of thinners should be turpentine. This will insure depth of penetration. The priming coat should be applied with a full brush and be well and evenly brushed out. Ample time must be given for thorough hardening, as paint dries very slowly on this lumber. Two coat work will not produce satisfactory results over this lumber, as thin coats of well brushed paint must be applied to insure satisfaction in binding and covering. Heavy coats of paint applied to this lumber will seal in a comparatively short time.



Birch.

BIRCH.

While not extensively employed for exterior work, it is used for this purpose in some localities.

A light, hard, strong wood of close grained structure, medium slow to absorb. Classed as an *easy* to paint.

The primer should be mixed to a medium consistency with sufficient turpentine to assist in spreading and working.

The priming coat should be applied with a brush and be well and evenly brushed out so as to remove any excess of paint on the surface.

Ample time must be given for thorough absorption and drying.



Hemlock.

HEMLOCK.

This is a coarse lumber; however, it is employed in some localities for exterior building.

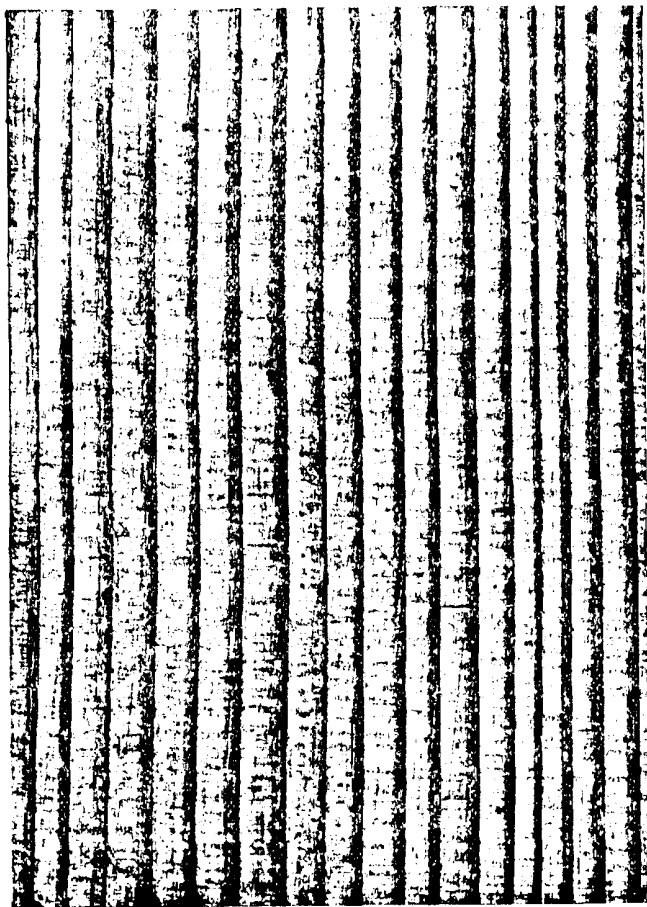
If well seasoned, it makes a light, medium, hard lumber. It is a crooked, coarse-grained wood, apt to warp and splinter; takes paint poorly and extreme judgment must be exercised in painting over this surface.

The absorption is very poor and uneven. The paint should be mixed to a very thin consistency with an excess of turpentine to assist in penetration and working.

The priming coat should be applied with a full brush and be well and evenly brushed out. Elbow grease is necessary in order to properly prime this surface.

Paint dries very slowly over this surface and it will be found that fully double the time must be allowed for thorough hardening than would be given to any other lumber.

Two coat work can not be recommended, owing to thin coats being absolutely necessary to produce satisfactory results.



Oregon Fir.

PRACTICAL PAINTING.

OREGON FIR.

Known also as White or Silver Fir. Fir resembles spruce in appearance and in its structural qualities may be distinguished from Spruce as well as Pine by the fact that Fir has no resin ducts.

A light, soft, coarse-grained wood of compact structure absorbs well but slowly.

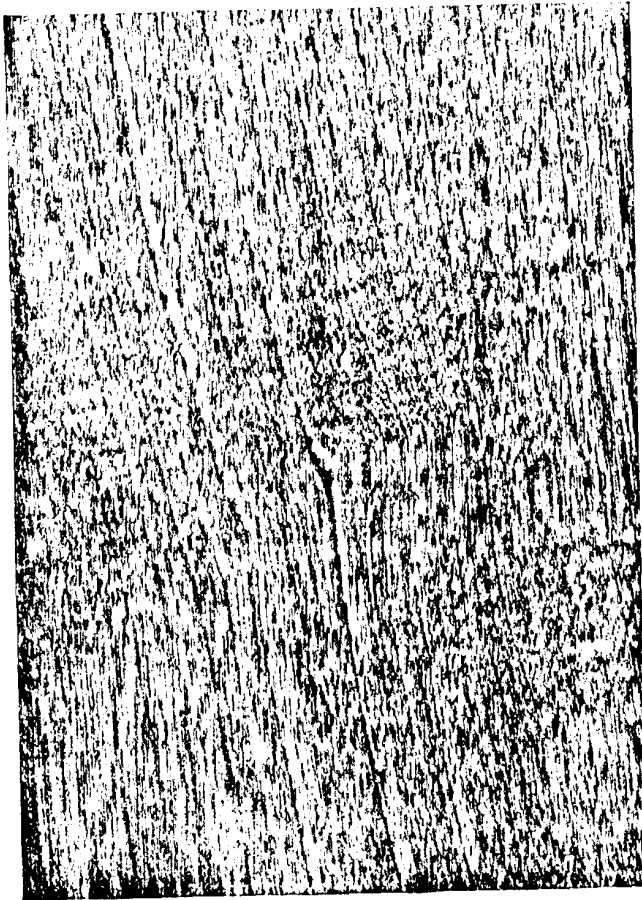
The primer should be mixed to a thin consistency by adding a liberal amount of turpentine to assist in penetration and working.

The priming coat should be applied with a brush and be well and evenly brushed out.

The drying is medium slow and ample time must be given for thorough drying and absorption.

Two coat work will not produce satisfactory results on this lumber on account of the light brown heartwood which is hard to cover.

A heavy priming coat produces uneven absorption and dries with too much gloss.



Oregon Pine.

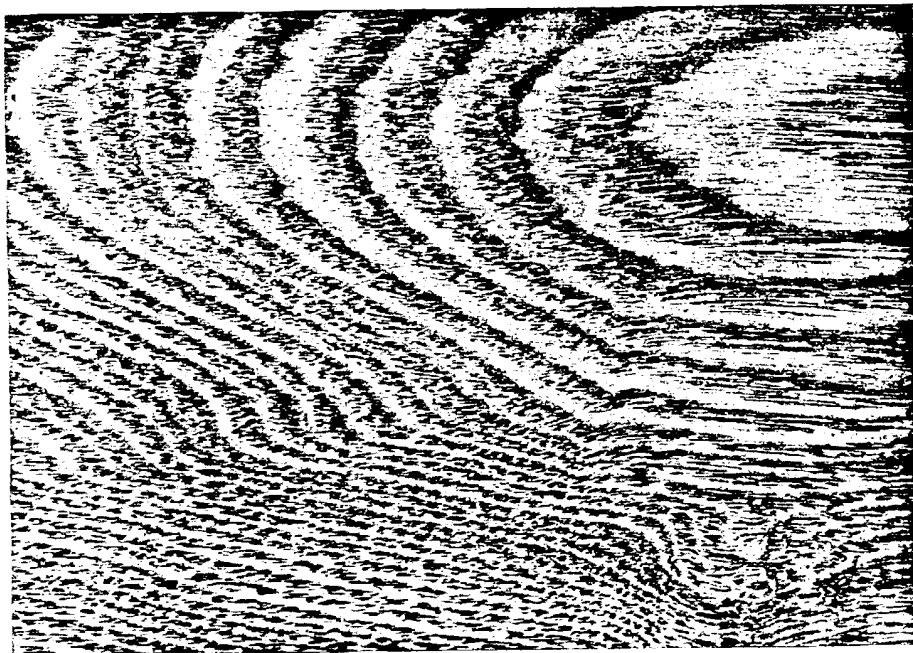
OREGON PINE.

Known also as Red Pine, Spruce, Douglas and Ington Fir. It is neither true pine, spruce nor fir, but of bastard hemlock. Its structural qualities are usually hard, strong and durable; heartwood, light yellow; sapwood, nearly white. Lumbermen divide Red and Yellow Fir, the former dark red and coarser, the latter firm, light yellow and more desirable. Known in the northwest as Red or Yellow Fir, it being the universal timber of that section for both exterior and interior finishes. Owing to its beautiful grain, it is well adapted for both staining and natural finishes. It is a difficult wood to season, owing to its resinous character. It will season better if treated with live steam to kill the pitch, it takes paint and holds it well if properly reduced and applied.

The absorption is medium slow and uneven; rather than Southern Hard Pine as a difficult lumber to paint. It necessitates similar treatment. See Pages 59-60.

The primer should be mixed with a liberal amount of turpentine. The priming coat should be applied with brush and be well and evenly brushed out. The drying should be slow and ample time should be given for thorough penetration and absorption.

Satisfactory two coat work can not be done on Oregon Pine lumber, as thin coats must be applied in order to obtain uniform absorption and satisfactory results.



Ash.

ASH.

Although not relied upon for outdoor construction, it is used in some localities for exterior building.

It seasons well, but does not last when exposed to the weather. A heavy, hard, strong lumber of coarse grain and compact structure.

The primer should be mixed thin and still carry enough pigment to assist in filling the open grain. Turpentine should be liberally used in the priming coat to assist penetration as well as filling.

The priming coat should be applied with a full brush and be well and evenly brushed out. Most of the brushing should be done with the grain of the wood. Careless priming will not produce satisfactory results on this surface.

The drying is good, but ample time must be allowed for thorough hardening of the heavier coat which is in the open grain.

Two coat work can not be recommended, as thin coats must be applied in order to properly fill the wood.



Chestnut.

CHESTNUT.

While not used to any great extent for exterior work, it is, on account of its durability, used in some localities.

A light, coarse-grained wood, seasons badly, and is liable to check and warp.

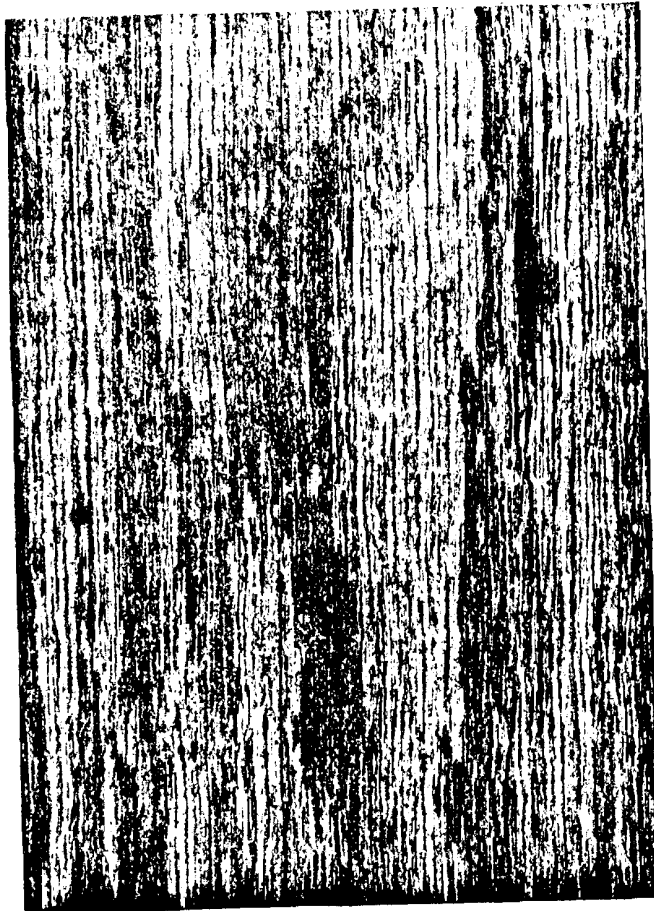
While classed as light, open-grained wood, the drying process is medium slow. A most difficult wood to prime, it requires extreme care in priming. The wood must be allowed to have the grain full of paint when first applied, and when hard dry it will be found that the paint has not penetrated.

The primer must be mixed thin with a liberal amount of turpentine.

The priming coat should be applied with a brush, and be well and evenly brushed out.

The drying is slow and ample time must be allowed for thorough hardening and absorption.

Two coat work can not be recommended over the surface, as thin coats must be applied.



White Oak.

OAK.

Formerly relied upon for all purposes in connection with house and mill architecture, but now supplanted by softer woods.

Not used extensively for exterior building.

An open grained, heavy, tough, durable lumber; warps and checks unless carefully seasoned. The drying is very slow.

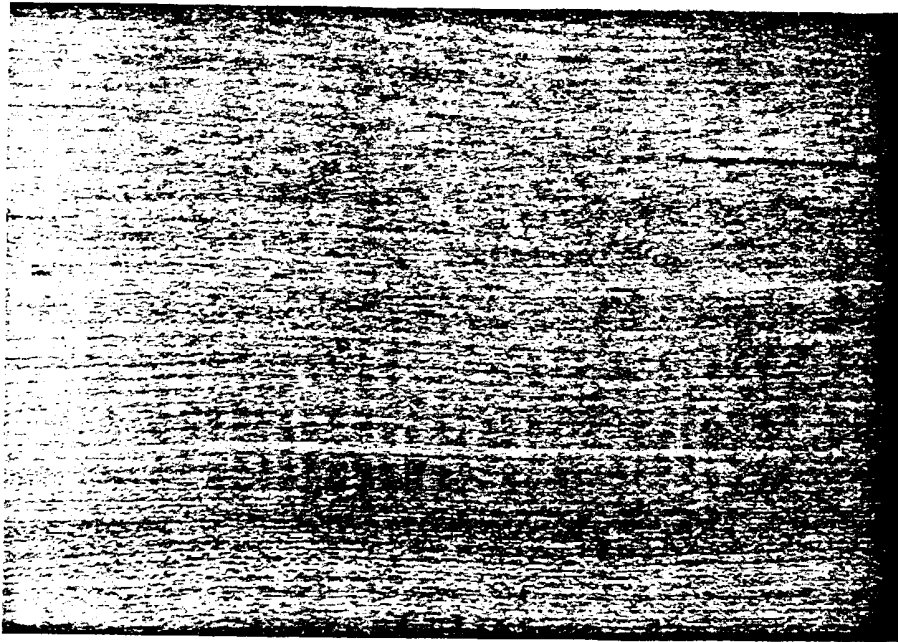
The primer should be mixed very thin, carrying a large percentage of turpentine to assist in penetration and drying.

The priming coat should be applied with a full brush and be well and evenly brushed out.

The drying is slow and ample time must be given for thorough hardening and absorption.

Two coat work will not produce satisfactory results over this lumber, as thin coats are absolutely necessary in order to fill and satisfy the surface.

This lumber must be carefully primed to avoid an excess of paint on the surface.



Maple.

MAPLE.

Not used extensively for exterior building.

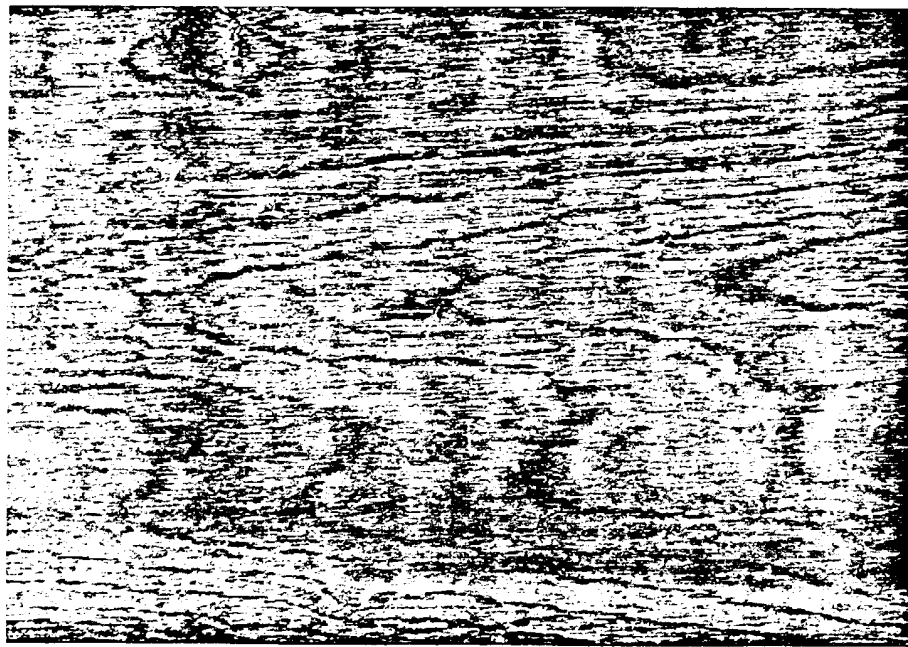
It is grown over a wide range and varies from a heavy, tough, hard and strong wood of the sugar or hard maple class to a light, soft wood of the boxelder or ash-leaved maple class. It is close grained, of compact structure, seasons well with moderate shrinkage. Owing to its even, uniform grain, it readily takes and absorbs paint.

For primer, the reduction should be to a medium, thin consistency, carrying sufficient turpentine to assist in penetration and working.

The priming coat should be applied with a full brush and be well and evenly brushed out.

Ample time must be given for thorough hardening. Paint dries well and evenly on this lumber.

Owing to its even, uniform grain and color, satisfactory two coat work can be done.



Elm.

ELM.

A tough, fibrous, durable, strong, hard, heavy and often cross grained wood. While used extensively for heavy timber and structural work, it is not used to any extent for exterior building.

Heartwood, light brown; sapwood, yellowish white. Seasons moderately slow and takes paint readily on account of its fibrous nature.

For priming, the reduction should be to a medium thin consistency, carrying sufficient turpentine to assist in penetration and working.

The priming coat should be applied with a full brush and be well and evenly brushed out. The paint dries well on this lumber, but ample time must be given for thorough hardening.

Satisfactory two coat work can be done over this surface if judgment is used in reducing the priming coat and the surface fully satisfied and evened up.



Hard Pine.

HARD PINE.

Known as hard pine, yellow pine, longleaf pine, shortleaf pine, Georgia pine, Southern pine, Norway pine and Red pine, according to the locality in which it grows. All are of similar character as to their susceptibility to paint.

A hard, heavy, tough, strong wood, very resinous, coarse-grained and of compact structure. It is very hard to season and runs from light sapwood to orange heartwood. A most treacherous lumber over which to apply paint and one which requires extreme judgment in the reduction and brushing.

It is not uncommon to find a building entirely constructed of hard pine, varying from a soft, porous and quick absorbing to a hard fat surface into which paint can not penetrate.

While it has been for years the chief building lumber of the southeast, it is now used extensively in all sections of the country. Practical painters, as well as up-to-date paint manufacturers, have given the subject of how best to treat this lumber in order to produce satisfactory results greater consideration than in the case of any other lumber used for exterior building.

Experience has proven that better and more satisfactory results can be obtained in painting over this surface by applying thin coats, well and carefully brushed out, carrying an excess of turpentine in the primer.

Heavy coats of full oil reduction should never be applied over this surface, otherwise peeling or scaling will soon take place.

Longleaved yellow pine is the source of turpentine in this country, and the sap or fat which is contained in this lumber is the virgin turpentine and under the heat of the sun's rays is brought to the surface and acts as a solvent on the oil, soon destroying its vitality or life. More trouble is brought about through the attempt to hide or cover this surface with heavy oil coatings than from any other source.

The absorption is very uneven, varying from quite rapid on the clear soft parts to very slow on the hard or fat parts.

The reduction of the priming coat depends upon the condition of the surface. If very fat, a larger percentage of turpentine must be used than if fairly clear.

Under all conditions, in priming hard pine, thinner mixtures and more turpentine must be used than would ordi-

Hard Pine--Continued.

marily be employed in priming a hard surface, the amount of turpentine varying, according to the run of the lumber, from 25 to 40 per cent of the total amount of thinners used.

Do not be afraid to use turpentine freely with this lumber, as this vehicle restores the life or vitality which nature gave it.

Turpentine will assist in opening the pores of the wood and give greater depth of penetration, as well as carrying or driving the sap into the wood to a greater depth of binding on the hard or fat pieces.

Apply the priming coat with a full brush and brush out well and evenly. Do not allow the brush to slip over the hard places, but work the paint well in. Extra care must be taken in brushing over this surface in order to even up the priming and not have too much pigment on the hard parts.

If a building is allowed to stand for a short time before priming the grain of the wood will raise and allow of better penetration.

Paint dries very slowly on this lumber and ample time must be allowed for thorough hardening and absorption.

Two coat work can not be recommended, as thin coats are absolutely necessary to insure depth of penetration or binding.

Three thin coats well brushed out will not leave an excess of paint on the surface, while two coats, which would necessarily have to be heavy in order to hide or even this uneven surface, will break away or scale in a comparatively short time.

OIL.

Of all the liquids which have from time to time been tried in painting, nothing has ever been found that so well meets the commercial requirements, both in durability and economy, as Linseed Oil. This is due to the peculiar property possessed by a limited number of oils (of which Linseed Oil is the only one sufficiently common and low in price to merit consideration), viz.: that of drying and absorbing oxygen and forming an insoluble, leathery cement or coating. It must not be understood that this oil coat is entirely unaffected by moisture. On the contrary, a plain coat of Linseed Oil, no matter how dry, will, on exposure to excessive moisture, become porous and spongy. This condition is largely overcome and the underlying oil coating greatly protected from over-drying or decay, by mixing with the proper pigments to form a paint which is far less porous, thus protecting the surface much better and longer than will the oil alone. The true life and protection of a paint is not the oil, nor yet the pigment, but the proper combination of the two, each enhancing the value of the other.

Always use Raw Linseed Oil where possible in reductions. The addition of dryer, whether in the form of Boiled Linseed Oil or Japan, tends to harm or destroy the life of oil. There are, of course, exceptional cases where more rapid drying, even at some expense of durability, is necessary.

Raw Linseed Oil, while a slow dryer, dries on the correct principle, which is from the bottom up, allowing of thorough, uniform hardening as well as depth of penetration by absorption. The drying of Raw Linseed Oil can be assisted materially by the judicious use of Japan. This assists nature in hurrying the oxidation but still retains the correct principle of drying from the bottom up. An excess of Japan tends to harm or destroy the life of the oil, causing the undercoats to powder or lose their binding properties. It will keep the paint from hardening and make spongy work.

There are very few exceptions to the statement that BOILED LINSEED OIL SHOULD NEVER BE USED FOR UNDERCOATINGS. Boiled Linseed Oil is a surface dryer and sets or skins over, keeping the under surface from drying and eventually causing cracking through uneven contraction and expansion.

Oil—Continued.

Boiled Linseed Oil is not a penetrator; owing to its heavy gravity and quick drying properties, it is not readily absorbed by the surface and the mixture becomes a surface coating only, without sufficient depth of penetration.

For iron or metallic surfaces, boiled Linseed Oil with a liberal use of turpentine is used and often recommended for undercoatings; the surface, being non-absorbing, produces a surface paint coat and the drying is by oxidation only. The turpentine assists in reducing the gravity of the oil, and allows of quicker drying, more uniform coating and protection of the oil by the greater percentage of pigment in the mixture.

Do not keep your Linseed Oil in the shed or in the back lot during winter. Linseed Oil which has been frozen or subjected to extreme cold weather is not fit to use in painting. Cold congeals the fats of the oil and when subjected to the heat of the sun's rays they melt, causing a greasy surface and ruining of the paint.

NEVER BUY OR USE SO-CALLED SUBSTITUTES FOR LINSEED OIL. THERE IS NO SUBSTITUTE. INSIST ON HAVING THE BEST AND SEE THAT IT BEARS THE BRAND OF SOME REPUTABLE OIL CRUSHER.

REDUCTIONS.

OIL REDUCTION.

A full oil reduction consists of oil only with the exception of 1-32 gallon of turpentine to the gallon of paint to assist in penetration; this is not enough turpentine to destroy the luster of the paint and will accomplish the purpose of penetrating a hard or glossy surface where it would be unsatisfactory to apply paint without the addition of a small percentage of this thinner.

A liberal oil reduction consists of $\frac{7}{8}$ oil and $\frac{1}{8}$ turpentine to form the total amount of reducers; this amount of turpentine will cause more rapid and even penetration but will not destroy the luster of heavy-bodied paint.

A medium oil reduction consists of $\frac{3}{4}$ oil and $\frac{1}{4}$ turpentine to form the total amount of reducers; this amount of turpentine will destroy part of the luster and cause deep penetration on a hard surface.

TURPENTINE REDUCTION.

A full turpentine reduction consists of nothing but turpentine and is used for producing a flat paint.

A liberal turpentine reduction consists of $\frac{7}{8}$ turpentine and $\frac{1}{8}$ oil to form the total amount of reducers.

A medium turpentine reduction is half and half turpentine and oil.

Dark shades require more turpentine to produce the same results as to penetration and flattening the paint than light shades. Zinc and combination paints require more turpentine than strictly pure lead to produce the same results as to destroying the luster of the paint.

Where light shades require $\frac{1}{8}$ gallon of turpentine to produce the desired results as to flattening or destroying the luster, also penetration, dark shades, require 3-16 of a gallon to produce like results.

TURPENTINE.

Turpentine does not burn the paint as many believe. Turpentine evaporates the slowest of any of the volatile paint solvents. It is used to give ease in working, form depth of penetration and assist in drying. Use turpentine liberally in priming or middle coats. When used in undercoatings, turpentine reduces the gravity of the oil and assists in opening the pores of the wood, thus allowing of greater depth of penetration. If used in middle coats or for recoating old surfaces, it assists in penetrating the previous coating and materially helps to cut the oil which is the gloss of the paint, leaving a better tooth for the binding of the finishing coat.

Never substitute gasoline or benzine for turpentine; they are not substitutes. Gasoline is not a paint solvent; it is the lightest of the petroleum products and worthless as a substitute for the use to which turpentine is put. Benzine and naphtha, while better paint solvents than gasoline, are light petroleum products of high gravity, reducing rapidly and evaporating quickly; they do not penetrate but evaporate on the surface, making the paint work hard, retarding the brushing out of paint and preventing working the pigment into the pores of the wood, leaving too much pigment and a dangerous undercoat without sufficient penetration or binder.

Study the surface to be painted and use turpentine in the reduction according to the condition of the surface. If new work, constructed of hard, close-grained lumber, more turpentine must be used than if constructed of soft, open-grained lumber of quick absorption. The liberal use of turpentine in priming improperly seasoned lumber or lumber which contains moisture will assist in producing better penetration.

In repainting an old surface, the first coat must be reduced with turpentine according to the porosity of the surface. If a hard, flinty surface, much more turpentine must be used than if porous or weather-beaten. The mixture should range from flat, half flat to semi-gloss. Never apply a heavy coating of full oil reduction.

Paint which has become fatty and gummy can be partially remedied by the addition of a small amount of turpentine. When painting in hot, humid weather, a small amount of turpentine added to the finishing coat will aid in hardening the paint.

MILDEW.

Mildew is a serious trouble. This is a vegetable growth and always a sure indication of dampness. It is impossible to satisfactorily paint a surface on which mildew has formed unless the surface is first treated to destroy this growth.

Ochre primers and ochre colors are particularly liable to this really serious trouble, due to the fact that they are largely of bog origin and contain the seeds or spores as they are called from which the mildew mold develops. Such growths result not only in a most serious discoloration of the work which at times may be taken as fading or change of color, but also are very destructive to the paint itself, mildew not only developing at times at the expense of the vegetable oil itself, but what is even more serious, growing between the wood and the paint and thus forcing the paint off.

Vegetable oils like linseed oil are not destructive to this vegetable growth, but turpentine is, hence the first thing to do in aggravated cases is to wash well and freely with turpentine, removing any loose paint—this will very largely destroy such growths. In addition, an exceptionally large amount of turpentine should be used in the first coat applied over such a surface; the paint should be well flattened. An undercoating well flattened with turpentine applied over a mildewed surface which has been washed with turpentine offers the best possible protection against repetition of the trouble.

JAPANS DRYERS.

The terms Japan and Drier are in many cases synonymous as applied to liquid products used by the painter to increase the rapid drying of his work.

The products sold under these names vary so greatly in their qualities and usefulness that it has not been considered advisable or possible to give specific instruction as to the amount to use in these directions for reducing paint. This could only be done were we to limit ourselves to a single Japan or Drier of known quality and strength.

A wide experience with these products as used by the painter shows the greatest possible difference between them. Some are sufficiently powerful so that even 5 per cent added to Raw Oil is enough to cause it to dry as fast as will Boiled Oil, and not only that, but to dry throughout or from the bottom up and not merely surface dry as will Boiled Oil. Others again are so loaded with resin and petroleum products and so deficient in true drying properties that 25 per cent or more is required to accomplish this result and then the resulting surface will be spongy or brittle, as the case may be, but in any event lacking in durability. The painter is strongly advised to test carefully the Japan he uses, be careful that it does not mush up or curdle when mixed with oil, and find from a series of painting tests when his Japan is used in different proportions or by mixing in different proportions with oil and drying on a glass, and noting the character of the dry film, the best proportion of a given Japan to use and then adhere strictly to these proportions, remembering that a Japan which properly used is entirely satisfactory, will when used in excess frequently retard instead of hastening the drying of the paint.

During damp, muggy weather do not attempt to force the drying of your paint by the use of an excessive amount of drier. The result can only be lack of durability in the paint and loss of reputation to the painter. Wait for time and clear weather to accomplish the drying properly.

The Japan or drier should be mixed with the paint while it is in semi-paste form. The mixing is thus uniform and the results satisfactory. If an attempt is made to add it after the paint is ready for the brush, the Japan is liable to curdle, it is difficult to mix uniformly and the resulting work is liable to be spotted, drying flat in some places and glossy in others.

Study well the action of your Japan with different kinds

Japan Dryers Continued.

of paint. Some Japans dry flat, others with a gloss; both are useful in their place, but the results are disastrous if the wrong class of Japan is used to accomplish a given result.

It should be borne in mind that Zinc or a combination of Zinc and Lead will require either more Japan or a stronger Japan than will Lead alone, provided it is essential to dry in a given time. Many of the dark colors carry an exceptionally large amount of oil and are slow in drying unless assisted by a fair amount of Japan. In such cases, turpentine also should be freely used in the undercoats to assist the drying and flattening the undercoat. The work will be much more durable since an oily undercoat or one carrying a heavy Japan gloss is sure to craze, crack or alligator.

Finally, even at the expense of repetition, we cannot too strongly emphasize the fact that for many kinds of work, while a drier or Japan is essential to produce the result aimed at, to get the work out in a reasonable time and avoid the risk of damage from such influences as rain, frost, etc., yet on the proper selection and proportion of this drier, rests in the highest degree the durability of the finished work.

PRIMING.

This is the most important paint coat applied to any surface. It must fill and satisfy the surface and leave a foundation upon which future paint coats can be successfully built. It holds the same relative position in painting as does the foundation of a house in building. It must last and successfully hold the superstructure as long as it remains. It must carry sufficient linseed oil to not only satisfy the surface but bind or hold the pigment to the surface. It must carry sufficient turpentine to cause penetration and assist in forcing, by absorption, the oil and pigment into the surface. The formation of the pigment must be such as to allow of penetration into the surface, and above all, the primer must be well and evenly brushed out and into the surface.

The common idea, viz.: that anyone can prime a building, is a serious mistake. The priming coat offers the best opportunity for judging a painter's work. If he is a capable, careful man, he will use as much or more care in applying this coat as he would in the application of the second or third coat. He will brush the paint into the wood, satisfying the soft grain, and carefully brush the hard grain where there is less absorption, leaving an even, uniform coating.

It is impossible to erect a frame building and have all of the timber of the same absorbing qualities. The sapwood absorbs paint more readily than the heartwood which is of a harder grain. This fact does not necessitate a different reduction for each kind of grain in the same lumber, but it does necessitate the painter's properly applying and brushing out the paint.

In priming soft wood, the paint should be applied with a full brush and enough paint used at all times to satisfy the surface. It should be well brushed and especially on the harder grain to assist or force the paint into this close grain and remove by hard brushing any surplus paint that remains on the surface.

On hard or close-grained wood a medium full brush should be used in applying the paint, as this class of wood does not possess the absorbing properties of softer woods, but requires more brushing in order to force a sufficient amount of oil and binder into the wood and at the same time not leave an excess of paint on the surface.

If the priming coat is of the proper consistency, carrying sufficient pigment to fill and hide the grain, and well brushed into the grain of the wood, most of the absorption will

Priming—Continued.

have ceased with this coat and no excess of pigment left on the surface. This thin coat will allow the second coat to penetrate through and satisfy any part of the wood which was not fully filled at the time of priming, also allow the second coat to bind itself to the wood and priming coat.

An excess of paint on very porous woods will cause peeling or chipping. This heavy coat prevents the oil from penetrating the woods and assists in holding the coat on the surface. The oil and binder in the second coat penetrates into this heavy coat only and does not reach the wood so as to assist in forming a solid coat well bound to the surface.

Paint heavily applied to a hard or close grained surface will dry with a gloss, forming a hard glaze over the surface, into which the second coat cannot penetrate to any depth; it will only fasten itself to the outside of this glaze coat, whereas it should go through to the wood so as to help strengthen the second and subsequent coats.

Do not prime a building and allow it to stand any longer than is necessary in order to thoroughly harden the paint and allow of full absorption. If allowed to weather, the priming coat will become porous and absorb the life of the second coat and there will not be sufficient binder left to properly adhere to the surface.

THE PAINT.

Provide a mixing keg large enough to hold sufficient paint for the coat to be applied and allow of stirring without danger of slopping over the side. A flat paddle proportionate to the size of the mixing keg, a good strainer and a set of measures are essential for the proper preparing of the paint.

The mixing of paint is no small job. The mechanical part is the breaking up or combining the paste paint with the oil and thinners to a consistency ready for use.

The mixing of colors or tints is an art that cannot be acquired by every one. Persons may be able to distinguish between red, green and blue in their solid, but can not distinguish between the shades or tints made by combining the colors with white, consequently, can not match colors or mix paint.

The mixing of paint to the proper consistency for the work in hand and keeping it uniform is very important and can not be successfully done without making one mix of the amount necessary for the coat to be applied; this should be mixed by one person in charge. It is hard for two men to mix two pots of paint the same or right consistency, as consistency, like distance or measurements, is not determined alike by everybody.

Figure out the amount of paint necessary for the work in hand. Supply a mixing keg large enough to hold the full amount of paint required, allowing for reduction and plenty of room to stir. If a liquid or prepared paint is to be used, note carefully the directions given by the manufacturer. The full amount required for the coat to be applied should be emptied into the mixing keg and thoroughly stirred; the thinners, if any are necessary, added by measure and well incorporated with the paint. In breaking up paste paints, the thinners should be added gradually to insure smooth and uniform results in the mixture. If all of the thinners are dumped in at once, the mixture will be lumpy. Where japan is used, always get the best and use it sparingly. Never add japan last or after the mixture has been thinned down. Japan, when added in this way, is very apt to cause curdling and it is almost impossible to work the japan into the mixture. First, the paint should be reduced to a heavy consistency with part of the oil and the japan and turpentine added while in this consistency. A good rule to follow is to mix the japan and turpentine together in a can, shaking well and adding this to the lead when breaking up. The

The Paint—Continued.

balance of the oil can then be gradually added until the proper consistency has been obtained, without danger of lumping or curdling the mixture.

It is very necessary to know the amount of turpentine and japan needed in the mixture. Turpentine and japan should be measured before adding. It is best always to measure the oil, so as to allow of readily ascertaining the cost of the paint. Where it is practicable, better results can be obtained by breaking up the paint one or two days before using.

All paint from priming to finishing coat should be strained. This assists in more thoroughly combining the pigment with the thinners, also assures a more uniform mixture in tins than can be obtained in any other way.

Prevent the paint from skinning over as much as possible by keeping the mixing keg tightly covered. Paint from which the skin is being continually removed will soon become very slow in drying properties. Do not allow paint to become fatty by leaving it exposed from one day to another. This is decidedly important with priming coats when the paint is mixed for part of the cornice or some part of the building, then allowed to stand for two or three days till another portion of the building is ready for priming, and especially important when this is repeated from day to day until part of the paint has been mixed and left open for ten days or two weeks. Paint which has been exposed for several days is not fit to be applied on wood, as it will only surface dry, if it ever dries at all. A great deal of the trouble in portions of buildings going wrong after the second or third coat has been applied can be traced to fatty priming.

Always keep the paint clean, free from skin and dirt and well strained.

Keep brushes and pots clean and the work will be easier and better done and the painter himself will feel better satisfied as the results will be always in his favor.

PRIMER.

Never use a cheap primer. While cheap in the first cost, it is without exception the costliest in the end. The primer should be of the best and of the same material as the intermediate and finishing coats.

Dry colors mixed by hand should never be used for priming. All paint pigments are much more bulky in the dry state than when properly handled under pressure and

The Paint Continued.

combined with oil. When a mixture is made without preservative, the outside particles of the pigment are only coated with the oil or thinners, and when applied to a surface, the wood having a greater attraction for the oil than does the pigment, the surface will absorb the oil from the pigment, leaving a dry, porous coating to which subsequent coats can not successfully bind.

YELLOW OCHRE PRIMER.

Under the present existing conditions, Yellow Ochre as a primer should be condemned by all practical painters as the most treacherous primer to use. While it must be admitted that Yellow Ochre was successfully used for years as a primer, still the conditions under which painting is done to-day are changed.

It is claimed that Yellow Ochre is a good filler, good oil carrier, easy to apply, stops absorption and is cheap. The practical painter of 15 or 20 years ago, who successfully used Ochre as a primer, had practically but two painting surfaces to consider—White Pine and Poplar, both of a similar character as to their susceptibility to paint—while now there are over twenty different kinds of lumber used of as many different characters. At that time the Ochres in use were the Imported French Ochres, all of a similar character, the natural composition of which was Oxide of Iron, Silica and Clay with Iron and Silica predominating. Such Ochres in the hands of a mechanic who understood the character of Ochre and studied the surface over which they were applied produced satisfactory results. These same Ochres are still obtainable and are used by all practical paint manufacturers as the base of the best grade products, such as a straight ground Ochre in Oil or as a tinting medium or combination color for the base of Olive Green, etc., but owing to the deposits of these Imported French Ochres being gradually worked out, the costs have advanced to such a figure that they are classed as too high priced for the average dealer to handle or the consumer to use.

While formerly there were several brands of Imported French Ochre, still they were of one general character and the treatment of one would answer for the treatment of all. In the past Ochre was Ochre, but with the present so-called French Ochre, or Domestic Ochre, or more properly speaking, yellow muds, which are the only Ochres obtainable within a price to which the consuming public has been educated, there

PRACTICAL PAINTING.

The Paint Continued.

are as many different kinds and characters as there are sections from which they come.

When we have said that the Domestic or substitute French Ochres which are sold dry or ground in oil of doubtful character, and of such quality that the manufacturer is ashamed to put his name on the package, have no commercial value as a painting pigment, we have covered the whole subject.

These cheap Domestic Ochres are not fillers; they plaster over the grain of the wood in place of filling it. They are also very susceptible to moisture and mildew, both of which will cause trouble.

It is impossible to thoroughly combine dry Ochre and oil by simply mixing them with a paddle. The Ochre can not be satisfied with oil under these conditions and when applied to a soft surface will absorb the oil from the wood, destroying the binder. On hard wood such a mixture will spread or slip over the surface without penetration, and if elastic finishing coats are applied they will break loose and peel off in large flakes in a comparatively short time.

Another cause of trouble is due to the fact of its being so hard to keep the Yellow Ochre Primer of a uniform consistency while working. When the work is commenced, the paint will apparently be of the right consistency for priming coat; after a few minutes' work it will be found to have become thick; this is on account of part of the oil having been used. If the paint is not again stirred or broken up until half the contents of the working pot is used, it will be found to be of still heavier consistency, and before the user is aware of it a thick, heavy coat of non-elastic paint will have been applied to parts of the building. The reason for this is that the material is so light in weight and works so easy that too heavy a coat will have been applied before it is noticed in the working. For this reason it is almost impossible to apply a uniform coat of dry Ochre and oil to a surface.

The custom of mixing a high grade Ochre with White Lead in the proportions of 15 or 20 lbs. of Ochre to 100 lbs. of Lead is one that can not be condemned if the painter knows and studies the character of the surface which such a mixture leaves.

Ochre is a good extender. It will allow of a larger percentage of oil in the mixture than will White Lead, thereby better satisfying the surface; but owing to its being of an entirely different composition, chemically and physically, than White Lead and leaving a much harder and less porous sur-

The Paint Continued.

face, finishing coats will not successfully bind unless this characteristic is studied and understood and care taken in mixing the finishing coat so it will penetrate this hard coating.

The principal danger from using a mixture of high grade Ochre and White Lead is that the man who does not understand these characteristics and sees no reason why the cheaper grade should not be used with as good results as the higher qualities copies from the practical man who does understand, or thinks he is copying and falls short of satisfactory results.

It is often the case that a painter is called upon to finish a building which has been primed with Yellow Ochre by the house owner. In such cases, carefully study the character of the surface before preparing the paint for the finishing coats. It will be found in most of these cases that the surface is unevenly covered and will necessitate extreme care in brushing and applying the middle coat to have even absorption and binding.

Ochre as a pigment is naturally a slow dryer and can be classed next to Lampblack in this respect. One of the greatest dangers from its use as a primer arises from applying finishing coats over it when it is only surface dry, as well as not understanding its characteristics when thoroughly dry.

Even the best Ochre Primer which has been allowed to stand and thoroughly harden through leaves a hard, flinty surface, to which subsequent coats can not bind nor penetrate unless its character is understood and the reduction of the finishing coat is made and applied accordingly. On such a surface turpentine must be used liberally in the middle coat to force penetration through this hard surface.

If a dry Domestic Ochre mixed by hand has been used, the surface will be porous and full of air spaces. Under no consideration should an attempt be made to finish over such a surface with one coat of paint, as the first coat over this primer must be mixed thin with a full oil reduction and sufficient turpentine to not only satisfy by absorption the partially dry Ochre on the surface, but penetrate through and into the surface.

HARDENING AND DRYING OF PAINT.

Paint dries by oxidation, evaporation and absorption.

OXIDATION.

Oxidation of paint is of the utmost importance. This action consists of the absorption of oxygen by linseed oil, whereby it entirely changes in its nature from a fluid which can be readily brushed out, to a tough, leathery coating. During this change the linseed oil gains in weight about 16 per cent by the absorption of oxygen, notwithstanding the fact that at the same time certain losses in the oil have taken place.

Raw linseed oil remains fluid for a period of several days, during which time it is continually absorbing oxygen which enters the entire body of the oil, causing it to dry throughout or from the bottom up. The addition of turpentine also assists this same process, acting as an oxygen giver to the oil.

Boiled linseed oil dries much more rapidly than raw, but quickly forms a dry film over the surface. This acts as a seal against the further drying of the paint through absorption of oxygen by the underlying oil. This surface-drying, leaving soft oil below, is very objectionable. For this reason, the true principle of drying from the bottom up or throughout, as shown by raw linseed oil alone or with the assistance of turpentine and certain dryers, should warrant the use of raw linseed oil as far as possible.

EVAPORATION.

The drying of paint by evaporation is largely due to the turpentine present, of which the major portion, after performing a threefold function, disappears. In this way turpentine has rendered the paint more fluid, making it possible to use a larger proportion of protective pigment with the oil, has assisted in the oxidation of the oil, and, most important, has greatly assisted both oil and pigment in penetrating the wood or underlying paint, thus binding them together as a more perfect whole.

ABSORPTION.

Owing to the cellular or spongy nature of the wood, or in some cases the old paint over which a coating is applied, absorption of oil and turpentine takes place as long as the

Hardening and Drying of Paint Continued.

oil remains liquid. This absorption is naturally greater with a slow drying raw oil; assisted by the penetrating action of turpentine, then with quick surface-drying boiled oil, and consequently adds greatly to the life of the wood. At the same time, one of the most important points to receive careful attention is that the oil be so regulated to different surfaces as to fully satisfy them without, on the one hand, leaving an extremely oily surface void of sufficient pigment, and, on the other hand, a dry coat of pigment from which the oil has been so far absorbed as to leave insufficient binder to insure durability.

HARDENING AND DRYING OF PAINT.

Hardening and drying of paint are classed together, but there is a great difference between the two. Paint can be called dry, and in fact be dry, but it does not mean that the paint is hard dry or sufficiently hard to be coated over. The difference is very material, especially as applied to the wearing qualities of the paint.

When the paint has not hardened through and is soft underneath, it allows of sinking in of the second or finishing coat. This is apt to cause the paint to lose its gloss, spot out and crack. Middle coats applied over a surface which is not hard dry will not dry properly; the undercoat being soft will retard the oxidation from the bottom, causing the paint to skin over or surface dry.

If paint begins to dry slowly from the bottom and more rapid oxidation takes place on top, forming a skin, there will be a soft coat between the two, and as drying takes place in the center, it will draw the top skin or coating, causing the paint to crinkle.

Paint, varnish or similar products applied over a glossy surface or a surface which is not hard dry are more apt to remain tacky than if applied over a thoroughly hardened and flat surface.

Some paint pigments are natural dryers, while others are non-dryers; the non-drying pigments when used in painting, if not properly prepared and applied over a suitable surface, are very apt to dry tacky and remain so. Paint will dry in a few hours, but it takes days for it to harden. Drying of paint is classed in many ways, as follows:

PRACTICAL PAINTING.

Hardening and Drying of Paint Continued.

SETTING OF PAINT.

Setting of paint means that the coating has commenced to oxidize or dry to a point where the surface has a tough tack or pull under pressure of the hand.

DRIED DUST FREE.

Dried dust free means that the paint is sufficiently dry so that dust or dirt will not adhere to the surface.

SURFACE DRY.

Surface dry means that the paint has commenced to dry or skin over the surface. When touched with any pressure, the skin will break and expose an undry coating of paint.

SPONGY PAINT.

Spongy paint means that the paint is not solid or hard through. This is caused by an excess of oil or japan which has not thoroughly oxidized.

TACKY PAINT.

Tacky paint is more often caused by improper application of the undercoats than through any fault of the paint itself. This tacky surface which has not hardened through is caused by the application of paint over an undry or glossy surface, or the use of rosin oil, rosin japan or an excess of boiled or fatty oil.

Tacky paint leaves a variable surface according to those conditions, hard in cold weather and soft in warm weather, no matter how long applied. Paint applied over such a surface is sure to alligator.

SOLID DRY.

Solid dry undercoats means that the paint has dried solid throughout and can be scuffed or scraped. This surface is not easily affected by heat, is not over elastic and does not contain an excess of oil.

HARD DRY.

Hard dry means thorough and uniform oxidation of the oil from the bottom out. Such a surface is tough and elastic throughout.

If satisfactory results are to be expected, sufficient time must be allowed for each coat to thoroughly harden through. Be sure the undercoats are hard dry before applying subsequent coats.

BRUSHING.

In giving instructions for the application of paint, too much stress can not be brought to bear upon the importance of thoroughly brushing, or, to use an old term, of applying plenty of "elbow grease" in spreading the paint. On the working or brushing of the coat rests, to a great extent, the success of the material as to its durability in wearing and its protection of the surface to which it is applied.

It is an old and true saying that poor paint well brushed will last longer and have a better appearance than the best material loosely applied or flowed onto the surface. It is a fact that the best material, in the preparation of which great care has been exercised, will not give good results if improperly applied. The reason is that paint applied in this manner will not bind to the surface, neither will it dry nor harden properly, and a coat of paint that is not properly bound to the surface over which it is applied will be found to be hard dry on the outer surface, while it is not properly hardened through.

The better or fuller stock brush used, the more satisfactory will be the result, as a soft or cheap brush will not permit of thoroughly brushing the paint into the surface; it acts more like a mop than a brush, allowing only of smearing the surface over with a coat of paint.

One of the most important facts in thorough brushing of paint is the forcing of the air through the paint by the aid of the bristle and in this manner thoroughly mixing the oxygen with the paint, also forcing the confined air out of the surface to which the paint is being applied and in its place forcing the oil, turpentine and pigment, thereby sealing the pores or grain of the wood against dampness, also causing deep penetration of the paint and its proper drying and hardening.

A FEW POINTERS.

Do not expect the paint to do all the work. It won't. No manufacturer of paint can make *one* paint which will meet every requirement.

A successful painter is one who makes a thorough study of the work on hand and knows what is necessary in order to produce the best results. If oil or turpentine is needed, he should know where and how much.

The workman must always remember that "cleanliness is next to Godliness," and always have a clean suit of white overalls once a week, never wear blue or any other color. Remember that it is an insult to a good workman to have a man come on to work with a colored uniform; the man who does this is branded a "dub," and usually is.

Always have a clean piece of cloth with which to keep the hands clean and remove spots from glass, door knobs, etc. A small amount of vaseline rubbed over the hands before commencing work will keep paint from drying hard and through such the paint can be removed with very little exertion.

Always keep your entire appearance clean and tidy, so if invited into the house for any purpose you will not be ashamed to go.

Never suggest some other color after the selection has been made; it may cause you a lot of extra work.

Never go into a house to loosen sash or like work until you ask permission.

Never take hold of curtains and window shades with dirty hands. Best ask the people of the house to adjust them for you.

Always inform the occupants of the part of the building on which you are going to work, as it is not always convenient to have painters in certain parts of the building at certain times.

When working for Mrs. K., never speak of the condition in which you found Mrs. J.'s house or back yard. Such is none of your business - you are employed to paint, not talk.

Never take liberties with other people's property, such as hammers, hatchets, step-ladders, etc., without first asking the privilege to use them. It is better to have tools of your own.

Inhalation of paint and kindred products often makes some persons temporarily sick. However, the amount of poison

A Few Painters: Continued.

absorbed into the system in a lifetime through this inhaling can do but little harm. Where, on the other hand, the pores of the skin will absorb enough poison in one year to eventually bring about a very serious complication of physical troubles. Therefore, it is most essential for the painter to practice decided cleanliness.

Never criticise taste or selection of colors. Tastes differ. What suits you might not suit your customer. It is best to let people make their own selections and you do the work. You need all the friends you can get. Do not make enemies by talking about your brother painter's work. Yours might not turn out as you expect—we are all liable to mistakes.

EXTERIOR PAINTING.

NEW WORK.

CAUTIONS.

Be sure the character of the lumber is understood as to its absorption of the paint, and to assure satisfactory results see that the paint is reduced as thin as possible according to the conditions.

DO NOT PAINT immediately after rain storms, heavy dews, fogs or in frosty weather.

See that the surface to be painted is thoroughly dry and in proper condition to receive paint.

Do not follow too closely after the carpenter, as siding which has been tied in bundles is very often wet on the inside. Allow time for the siding to dry out, remembering that it is very hard to secure dry lumber.

Do not apply Shellac too heavy to knots and sappy places. Have it thin and brush well into the knots or other places that require Shellac.

Where light shades of paint are to be applied, use white or very light colored Shellac.

PRIMING.

CAUTIONS.

It is bad practice to prime a building from a carpenter's scaffold. It is best to have the entire building ready to prime at one time so that the same mix of paint can be used. In this way a more even and better coat of priming can be given.

When a building or any part of it is ready to receive the priming coat, the carpenter should remove all scaffolds, blocks and braces. This leaves the building with no part of the surface hidden and all of it can be primed without interference. Ridges are left on a building primed with blocks or braces nailed to the corner strips or any part; when touched up, it is impossible to hide these spots so they will not soon show through the second and third coats.

It is good policy to always prime a building before the plasterer commences his work, as the priming coat will keep the dampness and fumes of the mortar beds from penetrating the surface.

Reduce the paint according to the absorbing properties of the surface. Do not be afraid of getting the primer too

Exterior Painting. New Work, Cautions—Continued.
thin. It must be thin enough to both satisfy and fill the surface and not leave an excess of pigment on the surface.

The reduction must be with oil and turpentine, according to the character of the surface. Where hard, close grained woods are to be painted, a large percentage of turpentine must be used to assist in opening the pores of the wood and allow of greater depth of penetration.

The main point in priming is to satisfy all of the surface, thus leaving a uniform, even coating. A soft place here and there that is not satisfied and has received only half enough paint will soon dry out spotted; other places, where the wood is hard, an excess of paint which will dry with a heavy gloss.

A good and satisfactory job of painting can not be done over an uneven coat of priming. The priming coat should be applied with as much care as the finishing coat. Great care should be taken in keeping the paint of a uniform consistency.

Where it is possible, prime the entire building at one time, as it is hard to prime a building in patches and obtain uniform results.

In priming, use a full brush of paint to satisfy the soft spots, brush well and do not allow a surplus of paint to remain on the hard places.

The priming coat should be as thoroughly and carefully brushed out as the finishing coat. To accomplish this, a good full stock brush must be used. Do not try to use a half-worn or cheap brush, as good results can not be accomplished with poor tools.

Use a medium full brush for painting under projections, cornices and under edges of the siding, being sure to fill all of the joints with paint; then use a full brush on the face of the siding and corner strips, thoroughly working the paint out under the brush so the pores of the wood will be filled.

Be careful not to use a dry brush on any part of the work.

A building primed in the foregoing manner will leave an even surface over which to work and the second coat will go on smoothly and can be brushed out, thereby saving time and material.

PUTTY.

CAUTIONS.

Do not use cheap, ready-made Putty. If it is not possible to secure Putty that is known to be made from Linseed

Exterior Painting. New Work, Cautions—Continued.

Oil and Whiting, it is best for the painter to make the Putty himself. This will not take much time and he can always be assured of overcoming some very annoying results.

CHEAP PUTTY will peel from glass or after being traced with paint. Where used in grooves or over nail heads, it will turn yellow after paint has been applied. It is also apt to fall out, which is one of the most annoying things that can happen.

A formula still in use by old practical painters is to take
5 lbs. Gilder's Whiting,
1 pint Raw Linseed Oil,

the Whiting gradually added to the oil and well kneaded in. As the mixture becomes too stiff to work by hand, pound it off with a mallet until all of the Whiting is added and mixture is of a glazing consistency.

For a waterproof or harder-drying Putty for use in floor seams or other exposed places, to the foregoing add one pound of keg Lead well worked in. If the keg Lead is of a thin consistency, a little more Whiting may be necessary to bring the Putty to the proper consistency. This latter mix will be found to be more durable and produce more satisfactory results for glazing and all exterior puttying.

Knife Putty into all seams, cracks and nail holes; do not use the thumb in pushing Putty into seams and cracks.

MIDDLE COAT.

CAUTIONS.

Be sure the priming coat is hard dry.

Do not have the second coat too oily, thus drying with too high a gloss, as this will cause the finishing coat to crack, peel and flatten.

Do not paint over dirt, grease or mud splashed on the building from down spouts.

Do not paint over frosts, dews or wet places.

Do not paint while the plastering is drying out.

Be sure the basement is not wet or damp. If such is the case, the moisture is liable to go up through the house between the walls and siding and be attracted to the surface, causing dampness between coats, which will result in peeling in a short time.

See that the basement windows or ventilators are open, allowing the basement to thoroughly dry out before applying a second coat of paint.

Use a full stock brush that has been well broken in; even

Exterior Painting. New Work. Cautions—Continued.

up by thoroughly brushing any skips or uneven places in the priming coat.

Where light shades are used for trimming, better results will be obtained by applying the trimming color on both the middle and finishing coats. Medium dark shade trimming colors can be used for the finishing coat only. Apply two coats for solid colors, such as Green, Black, Red, etc., or one coat over a suitable ground color.

FINISHING COAT.

CAUTIONS.

Do not paint when there are indications of rain or the weather becoming cold.

Do not work late in the evening of cold nights. The paint will pucker or crinkle if a frost or cold wind strikes it when half dry.

Do not attempt to apply paint early in the morning, or on a surface that has been covered with frost the previous night. Allow plenty of time for the surface to dry.

After the paint has set, do not attempt to touch up the spots that have been missed. This will cause peeling of such places. Wait until the paint is dry, repainting the parts on which such spots may show. The paint should be well brushed and plenty of elbow grease used. Paint flowed on to cover or hide the surface will soon crumble or break away in scales. No paint can be properly applied to a surface without heavy brushing; this makes one coat adhere to the other. Heavy brushing also starts oxidation by forcing the air through the paint. Thorough brushing keeps the paint coat even and uniform and prevents the paint from crinkling or leathering, which is sure to be the result if it is not uniformly applied. Improper brushing will produce heavy spots which are sure to pucker or crinkle, eventually causing the paint to blister or peel on these places.

Always finish a stretch before leaving for lunch or at night. Do not attempt to touch up ladder or stage marks, as such will always show in spots. Paint the whole board on which such spots show.

Always leave the paint for the finishing coat free from specks and dirt.

Good work can not be done with dirty or lousy brushes. Clean out pots at night. Put brushes away carefully.

If skins have formed or dirt has gotten into the paint, strain it before commencing to work.

Exterior Painting. New Work. Cautions—Continued.

TWO-COAT WORK.

PRIMING.

(Note Cautions in regard to Priming.) Before commencing, be sure that satisfactory two-coat work can be done on the lumber to be painted.

Be sure the surface is dry, as the priming for two-coat work is of heavier consistency than for three-coat work and there is not the chance for the surface to dry out that there is if a thinner coat is applied.

Brush the paint out well. Do not flow on, leaving the paint heavy in one place and thin in another.

Remember this coat is to help cover the grain, as well as fill the wood, and only one more coat is to be applied to complete the work. If not uniformly applied, the last coat will soon show the effects of bad priming.

Work the paint well into nail holes, cracks, beading and seams. Avoid "holidays," as they will show up when the second coat is applied.

Have the paint of a medium thin consistency, carrying sufficient turpentine to assist in penetrating and filling the wood. This coat must both satisfy and fill and leave sufficient pigment on the surface to assist in covering or hiding the grain of the wood.

FINISHING COAT—TWO-COAT WORK.

(Note Cautions in regard to FINISHING COAT.)

Be sure the priming coat is hard dry over the entire surface before commencing to apply the second coat. It is very often the case that part of the work has been primed for a month or six weeks and other portions have stood for only a few days on account of the inability of the carpenter to finish the entire building, or like causes. Places such as the latter will in a short time crack or peel, and when a complaint is entered the entire house is given credit for having been primed a month or six weeks.

Do not apply the finishing coat during the time the plasterers are at work, as there is more or less trouble caused by the mortar being splashed or thrown over the work during this time; this necessitates retouching, which can not be done without showing spots.

Do not apply the finishing coat during the time the plaster is drying out, as it will absorb the moisture from the plaster, causing trouble through the paint peeling by having

Exterior Painting, New Work, Cautions—Continued.

damppness between coats.

Finish the interior of the building before applying the exterior finishing coat. This will give time for the plaster to dry out somewhat before this finishing coat is applied and result in a more clean and satisfactory job.

See that the basement ventilators are open. This assists in properly drying out the basement.

See that the surface is perfectly clean and free from plaster mortar before starting the work.

Carefully putty all nail holes, seams and cracks.

Reshellac the knots or supply places where the pitch may have come through the priming.

As this is the finishing coat, exercise care in having the paint uniform and kept to the right consistency to insure proper covering. The paint should be of a full oil reduction so as to be elastic, as this coat must both hide the surface and withstand severe exposure, it must be carefully applied and of the best material in order to accomplish these results.

Use a good stock brush and one that has been properly broken in. A new brush will not allow of proper application or spreading of the paint.

Work out well under the brush to insure proper binding and a smooth, even coat.

Do not use a paint which has to be flowed on to hide the surface, as this will leave a spongy coat without proper binding.

Bring the body and trimming color down together. Wipe off the body color from corner strips, door and window frames. Do not work this paint off with a trimming brush, as this will cause spots. Square up the work at noon and night so as not to have any laps.

THREE COAT WORK.

PRIMING.

(Note Cautions in Regard to Priming.)

See that the surface is dry and in condition to receive paint. Study the character of the lumber and reduce the paint according to its absorbing properties.

Note general information in regard to priming new work.

The paint should be mixed to a thin consistency to fully satisfy the lumber with only enough pigment used to fill the grain of the wood and not leave an excess of pigment on the surface. This will allow the middle coat to penetrate through the priming coat to a sufficient depth to adhere to

Exterior Painting, New Work, Cautions Continued.
the fiber of the wood, as well as the pigment in the primer, thereby assisting in binding itself to the surface as well as to the coats that are applied over it.

If the primer is mixed to a heavy consistency, it will retard absorption or penetration and leave an excess of pigment on the surface that will under contraction and expansion break loose when successive paint coats are applied.

SECOND OR MIDDLE COAT.

(Note Cautions in Regard to Middle Coat.)

Before applying the second or middle coat, be sure the priming coat is hard dry over the entire surface.

Note general information in regard to middle coat, new work.

As this is the medium between the foundation or priming coat and the protecting or finishing coat, extreme judgment must be used in mixing the paint for this coating. It must not be too elastic and should dry firm without a high gloss.

The paint for this coat, being the easiest working of any applied to the building, requires thorough and careful brushing to assure satisfactory results.

Reshellac knots or supply places if necessary.

Knife putty into cracks, seams or nail holes.

The paint should be mixed heavy so as to brush out well, also assist in filling and penetrating the priming coat, leaving a surface to which the finishing coat will readily adhere, as well as a surface which properly dries from the bottom out.

Too heavy an oil reduction will leave a high glossy surface over which the finishing coat will not adhere or properly dry. The reduction should be with sufficient turpentine to form penetration and still make a paint which will be elastic enough to withstand contraction and expansion and dry firm. Over such a surface the finishing coat can be brushed out smoothly and evenly without crawling or slipping under the brush. The paint will dry without danger of puckering, leathering, or flattening of the finishing coat as would be the case in a short time if applied over a high gloss. It is also very apt to crack and peel if oily coats are applied one over another. It is almost impossible to have solid painting with an excess of oil in undercoats as the coats will most always be spongy, rarely adhering closely to one another.

Exterior Painting, New Work, Cautions Continued.

FINISHING COAT—THREE-COAT WORK.

See that the undercoat is hard dry over the entire surface.
The surface should be perfectly clean and free from dust and dirt.

Repuffy where necessary.

Follow the same precautions as previously given for finishing coats.

Brush thoroughly and carefully. Use a full stock brush properly broken in.

Do not use new brushes for finishing coats.

The paint for this coat should be the most elastic one applied, as it must stand the most severe exposure.

It should be of good consistency with a full oil reduction, mixed so as to brush out smoothly and evenly, remain where left without danger of running or sagging and dry from the bottom out.

The drying and gloss are always assisted by having the under or middle coats properly reduced and applied.

Follow previous instructions as to cleaning off body color on parts that are to be trimmed. Bring down and square up the work so as not to show laps or poor workmanship.

ROOF.

CAUTIONS.

Be sure the surface is dry.

Do not use tar oil or other offensive smelling oils that will ruin the cistern water. Turn supply pipe from cistern when painting the roof.

Mix the full amount of paint required for the first coat, as it is very difficult to make two mixes for shingles which will appear the same.

Apply uniform coats to prevent spotting.

Have the priming coat thin so it can be easily worked into the cracks.

Keep ladders from resting on tin or in gutters. Hook over the comb of the house.

Trim the ridge-board and coping as the work progresses. In doing this work do not go over the roof with the ladders after it is finished.

The life of a shingle roof can be more than tripled if the shingles are dipped into properly prepared paint before being laid.

Exterior Painting, New Work, Cautions Continued.

In dipping the shingles, they should be dipped at least eleven inches. This will allow $4\frac{1}{2}$ inches to the weather and $6\frac{1}{2}$ inches for the under lap.

Never dip damp shingles; break the band around the bunch and spread them out to allow of drying before dipping or applying the paint.

For dipping shingles, use paint of the proper consistency for finishing coat, reduced with not less than 50 per cent raw linseed oil.

When the shingles are laid, finish with one coat of paint of a finishing coat consistency.

Remember the roof is subjected to very severe weather wear and soon shows defective work.

THE PAINT.

The paint for the roof should be of good material. A mistake which is often made is that a very cheap mixture will do for shingles.

Have the priming coat thin and enough of it mixed at one time to cover the entire roof.

Keep the paint uniform while working and avoid having heavy laps or spots, as they will soon show through the second coat and make an ugly looking job.

The second coat should be of good consistency and be well brushed out, using care to keep from applying the paint unevenly.

FOUNDATION AND FLUES.

Do not paint damp brick.

Oil paint is the best size for brick.

If the flues run from the foundation to the roof on the outside of the building and are to be painted a different color from the house or given a ground color of Venetian Red, they should be painted before the siding is painted, especially the first coat, as it is very hard to keep paint from splashing over the siding in working on rough brick.

Where flues are to be penciled and flat brick used, the flat color can be very easily applied after the body color has been applied.

Never apply less than three coats on brick. If after the second coat has been applied the soft brick shows, touch them up before applying the finishing coat. This will even up the work.

Exterior Painting, New Work, Cautions Continued.

THE PAINT.

The first coat for brick and foundation flues should be mixed thin so as to strike into the brick to a good depth and form a foundation for subsequent coats. Ten per cent of the total amount of thinners used in the priming should be turpentine. The second coat should be mixed half flat and well brushed over the surface. The third or finishing coat should be elastic, of good consistency and applied smoothly and evenly.

WINDOW SASH.

If the house is to be finished in natural wood on the inside, shellac the sash on the inside and prime on the outside. Paint the rabbet for the glass so that putty will adhere.

Before setting the glass, apply a coat of varnish to the inside and a coat of paint to the outside of the sash. This will save a great deal of time in tracing.

If the sash is to be black or dark color, give the surface a second coat of lead color mixed half flat. Never use black or dark sash color on bare wood.

OUTSIDE BLINDS.

Outside blinds should be primed before the carpenter fits them to the window. This will assist in keeping the blinds from swelling.

Paint for all coats on blinds should be thin and well brushed out. Do not allow the paint to be heavy on the rail or ends of slats.

Lay the blinds on a trestle with the stick side up. In painting, care must be taken not to get too much paint on the ends of slats, otherwise they will stick.

If the work is to be painted green or any dark color, finished with two coats, the best results can be obtained by applying a priming coat of OIL PAINT LEAD COLOR. The finishing coat must be mixed with raw oil and sufficient dryer to set the paint.

If three coat work, prime with Oil Paint Lead Color, second coat with a finishing color mixed with part turpentine. Do not paint the ends of the slats or inside rails with this coating. This surface should receive but two coats of paint. The finishing coat should cover the entire surface and should be mixed with raw oil and sufficient dryer to set the paint.

Exterior Painting, New Work, Cautions-Continued.
Brush out well between the slats.

Never use paint of heavy consistency on blinds.

When drying, open the slats. Care must be taken never to allow the slats to turn down flat when drying, otherwise they will stick.

VERANDA COLUMNS AND RAILS.

CAUTIONS.

These should be primed as soon as set, as they are usually made of heavy lumber and liable to crack if not primed.

Do not paint columns and rails unless dry. Paint will soon blister or peel on heavy timber if the least dampness is present.

Do not paint over shop or mill priming without thoroughly sandpapering or scraping off as much of this paint as possible, as it is usually a cheap mixture applied heavy, preventing penetration and not fit for priming. It will generally peel in a short time after other paint has been applied over it.

Do not be responsible for paint applied over primers other than the ones you applied.

Do not apply paint heavy on round columns, as very little paint is required on a round or convex surface. If applied heavy, it will soon blister, crinkle or peel. Carefully guard against an excess of paint on this kind of a surface. Use very nearly a dry brush and work the paint out well. The same applies to spindles and other turned work.

Guard against painting the tops of rails and like surfaces which are damp from frosts or dews.

THE PAINT.

The paint for veranda columns and rails should be reduced in the same manner as for the siding, but requires an extra amount of brushing.

The paint should be well brushed out to insure smooth, even coats.

Knife putty into all cracks and nail holes, using a good, hard-drying putty.

Sandpaper the columns and rails before applying the finishing coat, dust off and apply a well brushed coat.

This work, together with veranda and porch floors, should be the last finished on the exterior of the building, as such will insure the surface from being scuffed or damaged by use.

Exterior Painting, New Work, Cautions Continued.

VERANDA AND PORCH FLOORS.

CAUTIONS.

A heavy coat of paint applied on the tongue and groove before laying will more than double the life of the floor before keeping out the water.

Do not apply coats which are too oily. Brush well into the surface. Do not have an excess of paint or pigment on the surface. Remember the floors have to be walked on, consequently the paint must dry firm and hard.

Thoroughly fill all cracks and crevices with paint, then brush out.

Keep the work clean. Do not paint over mud, grease or plaster. Do not use old, fatty or skinny paint for floors. It will not make satisfactory work, will never dry hard and will soon scuff off.

Do not paint floors immediately after frosts or heavy dews. Allow plenty of time for the surface to become dry and warm.

Sufficient turpentine should be used in all coats to assist the paint in drying and hardening. More trouble is caused from floors not properly drying than from any other condition.

The finishing coat can not dry solid if undercoats are spongy; neither will the paint wear well where the undercoats are not thoroughly hard.

A finishing coat of elastic paint can be applied over a flat coat without causing trouble, but a flat or quick-drying paint applied over an oil coat will cause cracking or peeling.

Do not flow paint on floors and expect successful work. Two coats will not make a passable job on a porch or veranda floor.

THE PAINT.

For priming, the paint should be of a thin consistency, reduced with a liberal amount of turpentine so as to penetrate well into the surface.

See that the priming coat is thoroughly dry before applying subsequent coats.

Putty all seams, cracks and nail holes with putty which will dry hard.

The second coat for floors over good solid priming should be mixed half flat so as to dry hard and firm.

Enough paint should be left on the surface to fill and form a good protecting coat, but should not dry with a gloss

Exterior Painting, New Work, Cautions--Continued.

or tack, as such retards the drying of the finishing coat.

The third or finishing coat should be elastic and of good consistency, carrying sufficient turpentine to work free, penetrate into the previous coating and dry hard and firm. Remember that walking has to be done over this coat, therefore it must be brushed out smoothly and evenly so as not to leave heavy places which will dry unevenly and soon scuff up from usage.

FENCE.

Do not neglect the fence. Paint it as well and as neatly as the house.

The pickets, rails and caps should be primed before nailing up, as this will save a great deal of time and allow of all edges to be painted.

Do not paint the tops of rails or caps when damp from rain, dew or frost.

The paint should be of the same consistency as that used on the main building, and if the rails, pickets and caps are primed well before nailing up, two coats are usually sufficient for the fence.

The fence should receive the same trimming as the house. The paint should be of the same material as used for the main building and as well and neatly applied as on any other part of the work.

EXTERIOR PAINTING.

OLD WORK.

CAUTIONS.

In repainting an old surface, it is especially important that the contractor consult a practical painter.

Carefully examine the surface to be painted before commencing the work and determine whether there is any loose paint or whether the undercoat is in condition to break loose as soon as an elastic coat is applied over it.

If the building has previously been primed with oil, watch out for spots that have received a heavy coat and are ready to break loose.

Examine the surface for dampness from basements, drain pipes, down spouts and wet soil.

Before starting to paint, see that dampness has not undermined the paint and that the boards do not contain enough moisture to cause the paint to break loose as soon as other coats are applied over them.

Look out for loose scales, fine or powdered. They do not appear to be dangerous, nevertheless, they will keep the paint from adhering solidly to the surface and make it soon break away.

Be careful about mildew, as this condition is always a sure sign of dampness, and paint applied over mildew will soon spot or peel.

Examine the surface to see whether the paint of previous coatings has shriveled. Paint applied over a shriveled undercoating will soon break loose.

Prepare the paint according to the surface over which it is to be applied.

REPAINTING UNDER NORMAL CONDITIONS.

When the surface to be repainted is in good condition and not cracked or peeled, thoroughly clean the building free from dust, dirt or soot. Wash mildewed spots with turpentine. It is seldom that one mix of paint will answer for all parts of the building. Portions of the house that are the most exposed and weather-beaten should receive the most elastic coat of paint. Portions that are protected, like under porches and verandas, and portions shielded by trees and other buildings, which would **render** them in about the same condition as under verandas, should receive a coat of paint

Exterior Painting, Old Work, Cautions—Continued.

mixed so as to penetrate the old surface and dry hard and firm without high gloss. If one mix of paint, which will satisfy the exposed portion of the building, is applied over the entire surface and to the protected or hard parts of the building, this oily or elastic coat of paint will dry with a full or heavy gloss, retarding the drying of the second or finishing coat, also causing blistering, checking, cracking and flattening in a short time.

FIRST COAT.

For an exposed or weather-beaten surface, the paint should be mixed with 2:3 oil and 1:3 turpentine to assist in penetrating the old surface, as well as parts on which some paint still remains. It should be applied with a full brush to fully satisfy the surface and be well and evenly brushed out so as not to have an excess of paint on the surface where the old paint remains.

The corners and protected portions should receive paint that is mixed half flat or with enough turpentine to force penetration through the old paint, thus firmly binding this coat to the surface and preventing the second or finishing coat from crawling. The paint should be applied smoothly and evenly and be well brushed in. Do not flow the paint on and expect a uniform coat.

SECOND COAT.

When the surface is thoroughly hard, putty all cracks, seams and nail holes, knifing the putty well in. One mix of paint for finishing coat can be applied over the entire surface. This will dry uniformly. The paint should be mixed to medium heavy and elastic consistency and be well and evenly brushed out.

CRACKED AND PEELED PAINT.

Owing to the many kinds of cracked and peeled surfaces, as well as the innumerable causes from which they come, it is impossible to give definite directions for repainting under all of the varied conditions. Judgment must be exercised in studying the surface and treating the same according to its needs.

The following suggestions as to repainting a cracked or peeled surface will meet the most common of both found in the general run of painting.

Exterior Painting, Old Work, Cautions Continued.

The preparation of a surface before painting is one of the most important matters to be considered. Properly preparing the surface will often go a great way in assisting to make a successful job of painting over a very badly cracked or peeled surface.

To properly clean a surface, it should be scraped and carefully gone over with a wire brush. The kit should consist of a good scraper and two wire brushes, one stiff and coarse, the other fine and soft. On a surface where the cracks are small and fine, a soft brush will assist in cleaning the dirt from the cracks and leaving the surface in better condition than will a coarse brush. On a surface with large cracks or a peeled surface, a coarse, stiff brush will assist in forcing off the scales, also breaking the peeled edges that have begun to turn out and are sometimes very hard to break loose.

NOTE.—The amount of turpentine recommended in the following reductions is based upon a gallon of hand mixed or prepared paint of a full linseed oil reduction.

A CRACKED SURFACE.

Where the paint is cracked in small hair lines, it is usually called crazing of the paint. Generally these hair lines run crosswise of the grain the entire width of the boards to which the paint is applied. The paint is invariably very hard and this crazing is often attributed to an excess of zinc. It is usually caused from an improper reduction or combination of pigments which do not dry uniformly, one being more easily affected by heat and cold than the others, thereby leaving a paint surface which is not uniform as to contraction and expansion. This trouble is especially noticeable on parts of work that have to withstand a great deal of vibration.

If the paint has not been applied too heavy and upon examination is found to be perfectly bound to the wood, it can be successfully repainted in the following manner:

A great deal of care should be taken in the preparation of the first coat, as the surface is usually hard and brittle. If the paint is mixed half flat it will have sufficient turpentine to penetrate well into the undercoats, and if well brushed will thoroughly bind to them.

The finishing coat should be of good consistency and well brushed. It should contain from 1-32 to 1-16 gallon of turpentine to a gallon of paint, as the paint should not be

Exterior Painting, Old Work, Cautions Continued.

too elastic, otherwise it is liable to blister on this hard surface if exposed to heat when fresh.

Paint found to be cracked only through the top coat, the checks not running through to the wood, makes a very treacherous surface to repaint, as the first coat applied is liable to penetrate only through the hard glaze which has already commenced to crack and possibly breaking loose from the undercoats, and when a second and more elastic coat has been applied this glaze will break loose and cause the last coats to peel. The first coat should be mixed with $\frac{1}{4}$ gallon of turpentine to the gallon of paint, so as to penetrate, if possible, the glazy surface to the undercoats which are more firm, thereby binding itself as well as the finishing coat to the surface. The finishing coat should not be applied too elastic. This is to avoid having an excess of oil on the surface.

Large and deep cracks, running to the primer or undercoats, are usually caused by coats being applied too rapidly, not allowing sufficient time for proper hardening, or undercoats being mixed heavy with boiled or rosin oil or an excess of japan which did not allow the paint to properly harden and left the under-surface soft and spongy. Such paint is usually tough and elastic and the undercoats are found to be spongy and easily affected by hot or humid weather. This paint usually shows no signs of peeling, as it is very tough and seems to be firmly adhering to the wood, but to repaint the surface requires a great deal of care in keeping the new paint from following the first coats and cracking in like manner. Be careful not to have an excess of paint on the surface, as such will blister and peel.

Thoroughly clean the surface with a wire brush. Mix the first coat of paint fairly elastic or with 1 pint to $1\frac{1}{2}$ pints of turpentine to a gallon of paint. This will not dry too hard and will be sufficiently elastic to withstand contraction and expansion over this treacherous surface, also penetrate to a good depth. Brush out well and do not attempt to fill the cracks with this coat. The finishing coat should be mixed to a good consistency with 1-32 to 1-16 gallon of turpentine to the gallon of paint and be well brushed over the surface. If, however, all of the old paint is solid and dried through, a half-elastic coat ($\frac{1}{4}$ gallon of turpentine to the gallon of paint) can be applied and should be well brushed into the cracks. This will dry firm and hard and a second coat of elastic paint can be applied over it. This, well brushed into the cracks, will to a certain

Exterior Painting, Old Work, Cautions Continued.

extent fill them and make a very passable job without danger of blistering, which would be the result if a first coat of very elastic paint had been applied.

ALLIGATORED PAINT.

Where the paint is cracked in every direction, forming blocks, triangles, and in fact, every conceivable shape, it is called alligatoring. This comes from a number of causes, but can usually be traced to non-drying undercoats and heavy coats of different mixtures. Ochre or similar slow-drying pigments mixed with boiled oil will very often be found at the bottom of this trouble. Fatty paint or the use of adulterated oil also causes paint to alligator. Such paint is usually tough and hard except where it is well protected and there the undercoats will be found to be tacky and spongy. The only successful way to repaint this surface is to burn off the paint. This is a very difficult job, as the heat softens up the excess of oil and a gummy, sticky mass of paint is the result. This soon gums the knife, also forms a cement over the wood, which is very hard to remove. This, is especially true where successive painting has been done, the paint having been mixed with boiled oil or an excess of japan added, or where the paint has cracked when first applied and paint heavily applied over it in an attempt to fill the cracks, leaving the surface with an excess of oil paint spread over it.

To repaint this surface after the paint has been burned, follow special instructions for repainting burned work. See page 100. If it is not possible to burn the paint off, it can be painted with fairly good results if first cleaned with a wire brush, breaking the edges of the paint that may have commenced to show signs of peeling and turning out, also removing all the dirt from the cracks, then applying a coat of paint mixed with from a pint to a quart of turpentine to the gallon of paint, according to the elasticity of the surface. Do not apply a heavier coat than is absolutely necessary. Be particular to brush the paint well. Do not have the paint too flat on the protected or more elastic portions of the building, as these parts are very easily affected by hot or humid weather. Do not attempt to rush the work. Allow ample time for the paint to harden, then apply a finishing coat of paint mixed to a good consistency reduced with 1-32 to 1-16 gallon turpentine to a gallon of paint. Brush out well. This will not blister nor pull the undercoats loose and will make a fairly satisfactory job.

Exterior Painting, Old Work, Cautions Continued.

PEELED PAINT.

In preparing the surface for the repainting of peeled work, the same care should be exercised as with cracked paint. Where the paint has commenced to peel in small chips and upon examination it is found that the trouble is with the last or finishing coat, such is called chipping or fluffing. The trouble can usually be traced to the improper application of the paint or its having been applied over dampness caused by dews or frosts, also the paint becoming chilled or applied in freezing weather, not allowing sufficient penetration, which caused it to soon chip or fluff off. This trouble can very easily be overcome by scraping or going over the building with a wire brush and coarse sandpaper, removing all the loose paint and then applying one coat of paint of good consistency mixed elastic with 1/4 gallon turpentine to the gallon of paint. This mixture will thoroughly penetrate and bind to the undercoats, generally making very satisfactory work.

If the paint is peeling in small thin scales and the trouble only goes as far as the priming, it usually will be found upon examination that this coat was of material like yellow ochre which has been applied heavy and dried with a gloss, the second coat not reduced with a sufficient amount of turpentine to penetrate the hard surface. To repaint this surface, the scales and loose paint should be scraped and brushed off and a coat of paint, mixed with sufficient turpentine to penetrate the priming coat, applied over the spots where the paint has peeled; then apply a well brushed finishing coat over the entire building. This should not be too oily or elastic; otherwise it will break loose from the undercoats, but it should carry from 1-32 to 1-16 gallon turpentine to assist in brushing and penetrating the old surface.

Where the paint is peeling in patches, exposing the bare wood, and it is found upon examination that the backs of the scales have a heavy coat of ochre or some other dry pigment which is absorbing the oil from the wood, and the paint has not been applied uniformly and is breaking away in spots, these places can be scraped and thoroughly brushed, then a coat of paint mixed with a percentage of turpentine to assist in penetration applied over these spots. One coat of paint can then be applied over the entire building, if the surface is in fair condition, and the undercoats have not been applied too heavily. However, if the build-

Exterior Painting, Old Work, Cautious Continued.

ing has been standing and one coat is not sufficient, the first coat should be mixed half flat so as not to leave an excess of oily paint on the surface. This will even up the work and an elastic finishing coat can then be applied over the entire building.

When a building has been painted a number of times and the surface is peeling to the bare wood, the only satisfactory way to repaint this is to burn the surface to the wood, following special instructions given for burned surface.

Where the paint has peeled in spots from dampness, caused either by wet basements or plaster, the surface can be successfully repainted after the house has been allowed to dry out, by cleaning it and touching up the spots where the paint has peeled, then covering with one coat of paint. This will even up the surface and avoid repainting the entire building if only part of the house is peeling.

INSTRUCTIONS FOR REPAINTING OVER A SURFACE ON WHICH THE PAINT HAS BEEN BURNED.

Where paint is peeling or cracking badly, the only satisfactory way is to burn the paint to the bare wood. This leaves all of the surface practically new, and if the character of the work is understood good results can be accomplished, but it must be borne in mind that all paints when burned do not leave surfaces in the same condition and the resulting character of each must be understood before mixing the priming coat. Where an excess of boiled oil has been used in successive repainting and the work has commenced to crack or alligator, it will be found very hard to get the work in good condition, as the oil will set on the surface and form a glaze which is very hard to penetrate; likewise where fatty oil or paint with a percentage of gloss or resin oil has been used. While the heat of the burning lamp softens the oil and paint, it is very hard to remove all of it from the surface.

To repaint this surface, care should be exercised in thoroughly sandpapering and scraping or breaking this glaze where it is possible and a liberal amount of turpentine should be mixed with the first coat to force penetration through this hard surface. Where dry ochre or similar primer has been used, causing the paint to peel from its not having penetrated the surface, only a small proportion of oil having gone into the wood, it is very easy to remove

Exterior Painting, Old Work, Cautious—Continued.

with a burning lamp, leaving a surface which is practically new, as most of the oil will have been drawn from the wood during the process of burning. This surface can then be treated the same as any new wood, with possibly the exception of some protected parts where the oil has penetrated to a greater depth and the paint is in better condition than on exposed parts. The cause of blistered and peeled work can often be traced to too elastic a coating of paint having been applied over a burned surface. This is especially true where boiled or heavy oil has been used in the primer of the paint which was burned. Boiled oil should never be used in a paint applied over a burned surface—it will not penetrate but will lay on the surface and will soon crack, blister and peel. These troubles are often laid to dampness or the paint used, or some defect in the building which supposedly did not allow the paint to properly harden, while the true cause is from the paint not having been properly reduced or applied over the surface.

BLISTERING.

When paint blisters, the cause is usually attributed to dampness, and it is perhaps true that more trouble of this character on new buildings can be traced to wet or unseasoned lumber, fresh plastering, etc., than to any other cause, and on old buildings to bad roofs, leaky gutters, broken down spouts and wet basements. There are so many chances for dampness to get under the paint of either new or old buildings that it naturally follows there would be more blisters from this cause than from all others.

As to buildings being in the foregoing condition, the weather before and during the time the paint is applied has much to do with it.

Dampness causing blistering of paint is more easily detected than any other condition. This is especially true where the dampness comes from wet plastering, as the blisters will be full of discolored water which stains the paint when they break, and upon removing the paint over the blisters it will be found that there is very little, if any, paint or oil left in the grain of the wood. When examining surfaces where the water or dampness is not perceptible at the time of the examination, it is safe to assume, without fear of an error in judgment, that dampness has been the cause of the trouble; but there are also many other causes for paint blistering which are often laid to the fore-going.

Exterior Painting, Old Work, Cautions—Continued.

On new work, fat oil or paint will cause blistering, leaving a sticky substance in the wood. Fatly and non-drying oils, like paraffine, paint oils, etc., will cause the paint to blister in spots, leaving the surface greasy or oily. Where linseed oil has been used from the bottom of a tank and the settlings or fumes are mixed with the paint, it will cause blistering. This has the appearance of dampness, there being spots where the paint has not penetrated and the surface is almost bare. This paint will sometimes pull away in large blisters, the underneath of which show that the paint has adhered to the surface but contained something which would not allow of solid drying. This trouble can be attributed to non-drying mucilaginous matter which separated from the linseed oil and did not allow of uniform penetration, binding or drying. Such blisters are invariably oblong and follow the grain of the wood.

New linseed oil will often cause the paint to blubber in very warm weather, these blubbers causing small blisters; this is attributed to the moisture in the oil which the heat draws out in the shape of different sized blubbers, breaking and forming small blisters when the paint is dry.

Paint mixed with rosin oil will blister under extreme heat. Paint applied over old work blisters more often from the application of excessive oil coats than from any other cause outside of dampness. As stated before, dampness is easily traced in either old or new work. Numerous coats of oil paint will often blister very soon after the paint has been applied. The back of these blisters will show that the paint has at one time been dry and was hard enough to hold to the surface, but when paint was applied over it, it could not stand the tension or pull of the other coats. This is caused by numerous coats of oil paint which do not thoroughly cement together and form a solid foundation. This can be proven by the backs of the blisters which often have glossy spots that would not show had the coats of paint thoroughly cemented or adhered. Other parts of the blisters show gummy points, proving the paint had once been cemented together in spots. This also shows that the paint was over-elastic and had pulled away from the surface by the heat which broke the coats apart. This latter trouble is sometimes called a splitting of the paint. An excess of oil on a hard surface like ochre priming, where there has not been sufficient penetration, will cause the paint to blister on protected parts of the building, such as underneath porches, etc. This trouble is very hard to understand,

Exterior Painting, Old Work, Cautions—Continued.

but the true cause is excessive heat on a porch or veranda floor, reflecting on the sides of the building, causing blistering or the raising up and breaking loose of the paint from the under-surface; this is especially true where the sun reaches porches and verandas which have an enclosed end, preventing free circulation of air and causing intense heat.

Blistering sometimes takes place from excessive painting on the sides of buildings where the sun does not reach. This is caused by radiation of the heat, which is very intense at certain times of the day, and no free circulation of air, also from stone or cement walks which become very hot from the rays of the sun, radiating this heat and blistering the paint for some distance above these walks. Freshly painted veranda floors will reflect enough heat on the side of a building to cause the paint to blister and break away. Veranda ceilings will sometimes blister. The cause can be traced to water which has been thrown on the floor or to pools of rain water which reflect the heat of the sun on the ceiling, forming a lens the same as would a convex glass if laid in the same position. This reflection will cause the paint to blister on ceilings and the trouble is often unattributed to leaky roofs, gutters or like causes.

BLISTERING OVER OCHRE.

If a coat of oil paint is applied over a heavy coat of ochre priming which has dried hard and flinty, it will often cause it to blister badly when exposed to the heat of the sun. This result is due to the paint not penetrating into the hard surface, thus leaving an excess of oil on the ochre coat. Where ochre is mixed dry with oil, it is impossible to thoroughly incorporate the two, and when applied will sometimes raise up in small blisters; the under part will be found dry and the paint can be powdered. This is caused by the dry ochre lying on the surface, absorbing all of the oil and leaving nothing to satisfy the wood, consequently, the heat of the sun will soon pull it away. This is more noticeable after another coat of paint has been applied over the priming.

To successfully repaint blistered work, the character of each kind of blister must be understood; study the cause of the trouble and repaint the surface accordingly. If water or dampness is the cause, the paint for retouching should be mixed with a full oil reduction to satisfy the bare wood; if from fat oil, it must be mixed with sufficient turpentine

Exterior Painting, Old Work, Cautious. Continued.

to penetrate the surface which this oil leaves; if from fatty or non-drying oil, the surface must be first washed with turpentine to remove the grease, then touched up with paint mixed with part turpentine to assist in penetrating to a good depth.

For corners and like surfaces, the same directions apply for touching up as for a peeled surface. On old work where the paint has blistered from an excess of oil, retouch with paint mixed half flat. This will penetrate through the old paint and give a good foundation. After the work on the foregoing has been touched up, the entire building can be given a coat of paint; this will even up fairly well, but the spots caused by the blisters will show to a certain extent.

ROOF.

Do not paint damp shingles. Allow time for rain, dew or frost to dry off and the roof to become thoroughly dry. Sweep the roof with a good broom and remove all dirt, lint, cinders and soot.

The mix of paint depends upon the condition of the roof. Use good material reduced with raw linseed oil in painting shingled roofs.

On old shingles apply a uniform coat of paint mixed to the consistency of stain. It is necessary to have the paint of a very thin consistency to fully satisfy the old weather-beaten shingles. When thoroughly dry, apply a finishing coat of heavier consistency, well worked into the cracks.

If the roof has been previously painted or the shingles dipped before laying, and are in a fair condition, the paint can be used of heavier consistency and one coat is usually sufficient to do a satisfactory job on this surface.

It is sometimes claimed that a roof has faded or spotted out in a comparatively short time. This is more often the case where combination pigments which go to make up Greens or Olives have been used. In the majority of cases such complaints can be traced to the color not fading, but the oil having been absorbed by the shingles, these not having been fully satisfied by the undercoat reductions. A little oil rubbed over the surface will demonstrate that the full color is there but has flattened out through having been robbed of the oil required to bring out the original shade or brilliancy.

Exterior Painting, Old Work, Cautious. Continued.

FOUNDATION AND FLUES.

Foundations or flues which have never been painted should be treated the same as new work. Where foundations or flues have been kept painted, with oil paint, one coat of similar color mixed to a good consistency is usually sufficient. This should be applied after the house has been finished. If previously finished in flat color and is to be painted again in the same manner, one oil paint coat of good consistency and one coat of flat color should be applied.

WINDOW SASH.

Break sashes loose so they can be worked without trouble. Scrape off all loose paint and putty, then sandpaper. If the putty is soft or broken away, it is best to remove all and not attempt to patch up broken places. Apply a heavy coat of paint in the groove where the putty has been removed. The same paint used for trimming or body color is often used for this coat, but should usually be of a heavier consistency and requires a different mix; however, where blacks or reds are used, it is a good idea to have a ground work of dark lead color for black and terra cotta for reds. If the sash is in good condition, not badly weather-beaten, the paint should be mixed half flat and a finishing coat of black or red varnish color applied. Before applying this finishing coat, reputty the sash where necessary. If the putty is to be painted, it is best to reputty some days before tracing, so it will become set.

OUTSIDE BLINDS.

Remove blinds from the building and examine the slats to see whether they will work. If stuck together from previous painting, they are sometimes very difficult to break loose and require a great deal of patience to keep them from breaking. Use a sharp knife and cut in between the slats, also at the ends. Break one slat loose at a time. As soon as broken loose, cut or scrape the old paint from the edges of rails, also ends of slats, and break the paint from around the staples on stick so they will work freely. Sandpaper exposed parts and dust off thoroughly. If the blinds have been closed and the inside is in good condition, they will require only one coat of paint on this part. Exposed and

Exterior Painting, Old Work, Cautions Continued.

weather-beaten parts should receive the first coat of paint of *medium consistency* mixed with 2-3 oil and 1-3 turpentine, well brushed out. The ends of slats and inside of frame work do not need this coat. After the first coat has become hard dry, the blinds should receive a coat of paint all over. The paint should be of good consistency and be well brushed out so as not to have an excess of paint, causing the slats to work hard. Leave the slats open until the paint is dry. If closed, they are very apt to stick.

VERANDA COLUMNS AND RAILS.

Be sure that the surface is dry. Scrape and sandpaper loose paint from veranda columns and rails before first coating. Fill the cracks and nail holes with paint. See that there is no mildew on the base, skirting boards or lattice work caused by dampness underneath the porches and verandas. Knife putty into cracks and nail holes before applying finishing coat. Use the same paint as for the building, well brushed out on the round columns and turned work.

VERANDA AND PORCH FLOORS.

Sweep the floor clean, also remove dirt from cracks so that the paint can be brushed into them. Paint applied too heavily on floors will not dry solid and will soon scuff up. Be sure there is no dampness coming from underneath, as such will cause the paint to blister or peel and not allow of proper hardening. It is very hard to avoid blistering in the repainting of floors that have been kept oiled. First wash the floor with turpentine and wipe off dry, then apply a thin coat of paint mixed half flat. Allow ample time for the paint to harden, then apply the finishing coat mixed with 2-3 oil and 1-3 turpentine, well brushed out.

On old floors that have been kept well painted, one coat is often sufficient. Where they are badly weather-beaten they should receive a coat of paint of good consistency mixed with 2-3 oil and 1-3 turpentine. When hard dry, putty the cracks, nail holes and seams, then apply a coat of paint of heavier consistency mixed with the same proportions of oil and turpentine. The floors and steps should not receive the finishing coat until all of the other painting has been completed.

PRACTICAL PAINTING.

Exterior Painting, Old Work, Cautions Continued.

FENCE.

The fence should receive the same care as to preparing the work for painting as the building. Sweep and dust the work thoroughly before painting. The same mixture of paint should be used on the fence as on the house and the fence trimmed with the same color.

OLD WORK ONE COAT.

Where the paint has stood for two or three years and one coat is to be given over a shade similar to the one already on the building, the surface should be thoroughly cleaned with a wire brush or broom, then thoroughly dusted. It is sometimes necessary to wash the surface with sponge and water to remove the smoke and dirt, which otherwise will work up through the paint, changing the color and making un-uniform shades. It is almost impossible to brush dirt streaks out and the only way to get the work in condition for painting is to first wash the surface with water. Allow time for the surface to dry; then, if the wear of the paint is found to be uniform, one coat mixed to a good consistency with a full oil reduction and sufficient turpentine to assist the working will make a satisfactory job. If, however, upon examination the paint is found to be weather-beaten or wearing off in spots on the exposed parts, the building will have to be touched up on these exposed portions and a coat of paint applied to the entire surface to even it up; otherwise it will be spotted when the paint has dried out, making an unsatisfactory job.

If the paint has not worn down to the wood and is only worn off to the undercoats which are solid, mix the paint with half turpentine and half oil, go over the exposed portions of the building with a smooth, even coat, and as soon as hard dry give the entire surface a coat of paint mixed to a good heavy consistency, as before directed. The paint should dry out even, thus making satisfactory work.

As all portions of a building do not have uniform exposure, it is very hard to find a surface where one coat will produce satisfactory work over the entire building. On the most severely exposed parts of a building, the paint will naturally show more wear than on the protected parts and these exposed parts will need to be touched up or painted over to even them up with the less exposed portions.

PAINTING GALVANIZED IRON.

Galvanized iron is without question the most treacherous surface with which the painter has to contend and unless the nature of the surface is understood and judgment exercised in the application as well as the selection of materials to be used, satisfactory results can not be expected. There are no specific instructions which can be given that will insure absolutely satisfactory results in the use of paint over galvanized iron, but there are a number of precautions which, if taken, together with judgment in the application, will produce much more satisfactory results than if neglected. *In the choosing of the priming coat for galvanized iron, one must be selected which will dry principally by oxidation, as there is no chance for penetration on this surface. Galvanized iron which has been allowed to stand for some length of time, and especially if it has been exposed to several hard rains, is much more satisfactory to paint than if painted as soon as erected.*

Before painting galvanized iron, take a stiff steel-wire brush and go over the entire surface, roughing up or breaking the hard glaze of the surface and especially roughing up the joints which have been soldered. This will give a better binding surface for the priming coat. A mineral paint ground in pure linseed oil, properly reduced with a liberal amount of turpentine, makes a satisfactory primer for galvanized iron when treated as noted; but the most satisfactory priming for galvanized iron is a coat of Red Lead. This should be mixed thin, be well brushed out and allowed to thoroughly harden before finishing coats are applied. Red Lead of itself is a natural dryer and will oxidize on the surface. The Red Lead must be REDUCED TO A THIN PAINTING CONSISTENCY AND BE WELL BRUSHED OUT. A satisfactory reduction is at the rate of 33 lbs. of dry Red Lead to one gallon of boiled oil and one quart of turpentine. If in the opinion of the one who applies the material, further reduction should be necessary, it should be made by the addition of more turpentine. The use of dry Red Lead is one of the few exceptions to the rule "that a dry pigment mixed with boiled oil should never be used as a primer."

If the Red Lead is pure and of fine structure, as satisfactory a mixture can be obtained from its use dry as would be obtained from the product ground in oil. Mix only the required amount for immediate use. Pure Red Lead and linseed oil can not be kept as a stock mixture, as the lead will harden or set in a very short time. Figure out the

Painting Galvanized Iron—Continued.

amount necessary for the work on hand, thoroughly mix the dry Red Lead with $\frac{3}{4}$ of the oil the day before the mixture is to be used. This will give a more thorough incorporation between pigment and vehicle. The next morning add the balance of the thinners, thoroughly stirring. This mixture must be kept well stirred when in use to insure a uniform coating.

To ascertain the cost of a Red Lead mixture, the liquid yield of 33 lbs. dry Red Lead can be safely figured at 7-16 of a gallon increase over the amount of liquid used. One gallon of this mixture will cover approximately 800 square feet of plain painting on galvanized iron, one coat.

When this Red Lead priming coat is thoroughly dry, it should be treated with paint handled and reduced in the same manner as is recommended for second and finishing coats for three coat work of any description. **UNDER NO CIRCUMSTANCES SHOULD A LEAD OR ZINC PAINT BE APPLIED TO A BARE GALVANIZED IRON SURFACE.** Satisfactory results can not be expected from their use.

TO REPAINT A GALVANIZED IRON SURFACE.

Care should be exercised in never applying more paint to a galvanized iron surface than is necessary to hide and protect the surface. The primer is a surface coating only and will in time break away if repeated coats of oil paint are applied over it. This is caused by the natural pull or tension of elastic coats under contraction and expansion.

To repaint galvanized iron, note the character of the primer first applied; if well bound to the surface, clean thoroughly, and if to be painted a similar or darker color, apply but one coat. This should carry sufficient turpentine to penetrate into and bind well to the old coating. It should be well brushed and not heavily applied.

If two coats are necessary, the first coat should be mixed half flat and the finishing coat should carry a small amount of turpentine. Full oil reductions should never be used on a galvanized iron surface, as such will cause blistering under extreme heat.

If the surface is cracked or cracked, go over it with a stiff wire brush and scraper, removing any loose particles of paint and thoroughly cleaning the surface. Touch up any bare spots with Red Lead Paint. This will even up the surface and it can then be finished with one coat of paint which should not be mixed too elastic.

If the paint is peeling or is not properly bound to the surface, scrape thoroughly and clean with a wire brush to the bare iron; then rough up the surface and proceed as for new work.

STORE FRONTS.

NEW WORK.

Do not use cheap ground colors or Venetian Red to produce tints or ground work. They will cause paint applied over them to blister and varnish to curl and flake.

For work that is to be varnished, do not use colors ground in oil for the solid ground color; even though reduced with turpentine and dry apparently flat, they still contain too much oil as a satisfactory ground for japan color or to allow of varnishing over them with safety.

For application over the lead coats, use colors ground in japan for deep ground colors or tints which require a large percentage of coloring matter.

New store fronts, vestibules, etc., which are built of soft wood and are to be painted in oil, should receive a priming or first coat mixed with 2-3 oil and 1-3 turpentine. Allow ample time for thorough drying. Putty and sandpaper. The second coat should be mixed with half turpentine and half oil to a good consistency. When hard dry, sandpaper lightly and apply a coat of oil paint. This will not blister, provided the wood does not get wet from the sweating of glass or like causes.

If the fronts are to be painted and varnished, they should receive a priming coat mixed with half turpentine and half oil. When hard dry, putty and sandpaper and apply a coat mixed with 2-3 turpentine and 1-3 oil. The paint should be tinted to approach the shade of the ground work. When hard, sandpaper lightly and apply a flat coat of ground color. Rub this coat smooth with fine steel wool and apply one or two coats of color ground in japan according to the strength of the color. All that is necessary is sufficient japan color to make a solid coat. Stripe and ornament according to specifications, then finish with a coat of exterior varnish. If more expensive work is desired, a coat of color varnish can be applied over the japan color. This color varnish can be made by adding a small percentage of the japan color to the rubbing varnish. When hard, rub smooth with fine steel wool or curled hair. Stripe or ornament as desired, then finish with a coat of elastic varnish.

If the finish is to be black or green, the undercoats should be dark lead color; if white, dark terra cotta or dark red; if vermilion, dark yellow for light or terra cotta for dark, and vermilion for carnine or lakes where a deep effect is desired.

OLD WORK.

When store fronts and vestibules are to be painted in oil and are in good condition, showing no cracks or signs of peeling, they should be sandpapered smooth. If two coats are to be applied, the first should be reduced with half turpentine. Over this apply an oil paint. It should be borne in mind, however, that too much oil must not be used, especially where the fronts are exposed to the hot sun.

When store fronts and vestibules are to be repainted and varnished and the old paint has stood for two or three years and is in good condition, the surface not having received too numerous coats, they can sometimes be sandpapered smooth and a coat of flat ground color applied, then a coat of color in japan. Stripe and ornament, then finish with a coat of exterior varnish.

When the fronts have been repainted a number of times with oil paint, they will not stand sun exposure after receiving the varnish, without danger of blistering. In such cases the paint should be burned off or removed with a paint remover. The surface is then practically new and the work can proceed as with new work, with the exception of the priming or first coat, which should contain a larger percentage of turpentine to assist in penetrating through any old paint left on the wood. Then proceed as with new work, building up the surface in the same manner by using flat ground colors and color ground in japan and exterior varnish.

IRON STORE FRONTS.

Thoroughly clean the surface. If the work has been covered with a shop coat, scrape and thoroughly sandpaper before applying the paint.

In painting an iron store front in oil or flat color and varnish, the treatment should be the same as for a wooden front, with the exception of the first coat. The surface being non-absorbent, the first coat must be mixed so as to dry firm and hard by oxidation and evaporation. If to be finished in oil paint of a light tint with a lead or zinc base, the first coat should be reduced with 1-3 oil and 2-3 turpentine. If a solid oil color is to be used, such as black, red, etc., reduce with turpentine and a small proportion of japan to assist in hardening. Allow ample time for thorough oxidation. Finish with one coat of oil paint. If to be painted and varnished, the first coat should be mixed with $\frac{3}{4}$ turpentine and $\frac{1}{4}$ oil, tinted to approximate the shade of the ground color to be used. When hard dry, sandpaper and proceed with a flat coat of ground color as for a wooden surface.

INTERIOR FINISH—NEW WORK, PROTECTION AND PREPARATION OF THE SURFACE.

The protection and preparation of the surface should be the first considerations and should be as carefully planned and carried out for plain painting, staining, varnishing or natural finishing as for more expensive work, as these are often the foundations for a better class of future finishing.

Inside door frames should not be set until after the plastering has been completed, then put in with the other finish, otherwise the mortar will stain the wood badly and these stains can not be removed without a great deal of trouble. In fact, frames are often ruined by mortar stains and bruises from plasterers moving their scaffolding. These bruises and stains especially ruin the work when it is to have a natural stain or finish.

If the frames are set, they should be protected before the plasterer commences work. If the work is to have a natural finish and the frames are hard wood, they should first be filled with paste filler, then a coat of shellac or liquid filler applied. If the frames are soft wood and are to be stained, they should be given a coat of oil stain; if to be painted, they should be primed. If water or spirit stains are used, cover with a coat of shellac or liquid filler, otherwise the lime water in the plaster will change the color of water stains. A strip should be tacked to the face of the frames to protect them from being bruised or scuffed up during the plastering.

Floors which are to be finished natural or stained should not be laid until after the plastering is done. Floors should be the last work of the carpenter as well as the painter. This requires laying an extra floor. On the best and more expensive buildings this is looked after by the architect in his specifications. However, there are a number of buildings in which the floors are laid before the plasterer commences his work, and as these are to be finished either natural, stained or painted, they should be protected from plastering.

As soon as the carpenter has finished sandpapering and dressing down the floors, they should be carefully swept and dusted off. The cracks should be filled with either a good linseed oil putty mixed with 1-3 keg lead, or a good crack and crevice filler, which is not so likely to be affected by shrinkage of the floors as is putty.

If hard, open-grained wood, the floors should first re-

Interior Finish, New Work, Protection and Preparation of the Surface—Continued.

ceive a coat of paste filler, then a light coat of shellac or floor finish.

If the floors are soft or hard pine and to be finished natural, they should receive a coat of shellac or liquid filler of good quality, applied thin. If to be stained, they should receive a coat of oil stain.

When dry, cover the floors with heavy building paper or plain carpet lining tacked down solidly. Sprinkle dry sand around the walls to keep the mortar from soaking into the paper. Allow this covering to remain on the floors until after the painting or finishing is done on the other parts of the room. The floors should be finished last.

Before the carpenter turns the work over to the painter, he should remove from the rooms all blocks, slavings, etc., and turn as much of the building over to the painter at one time as is possible.

The painter should sweep the room clean and thoroughly dust off the work before commencing to paint, stain or varnish.

Putty nail holes, joints, etc., with good putty, one which will not soften with age or turn yellow if white or light tints are applied over it.

If the work is to be painted, soft pine doors and casings should first receive a coat of size to keep them from spotting. This should be a shade size if the work will permit. Good liquid filler is often used with good results by reducing to a thin consistency and applying a smooth, even coat. Hard drying varnishes, such as Copal and Hard Oil Finishes, are successfully used by applying them thin. Glue size can also be used if applied hot and very thin. It should not be allowed to get cold, as it will not strike into the wood but remain on the surface and is liable to break away. It is very hard for ordinary dampness to affect glue size after it has been properly applied and covered with paint or varnish. Where the price of work will not permit of sizing or the specifications do not call for it, satisfactory work can be done by mixing varnish with the priming coat. Varnish and turpentine will, to a certain extent, keep the work from spotting.

The paint for interior work should be mixed with a large percentage of turpentine. Oil will turn the work yellow. If white work, such as flat white, white enamel, etc., is to be done, it is absolutely necessary that the priming coat should be mixed with turpentine, otherwise the work will yellow in a very short time, especially where sizing has

Interior Finish, New Work. Protection and Preparation of the Surface—Continued.

not been used. An excess of oil will also cause the work to crack and check badly. Too much oil can not be used for interior work with safety. Where the work is to be finished with oil paints, more oil can be used in the priming. It should be borne in mind, however, that interior work should always dry hard and firm to insure good results from its present painting, also to allow of satisfactorily repainting.

In giving these directions for the different classes of work, the one principal object has been to caution against the application of too numerous coats. It is not the amount of paint applied to a surface which produces the results—it is the manner of application, the proper mixing of the paint and the preparation of the surface. In enameled or grained work it is especially true that where too numerous coats of ground work are applied, it is very hard to repaint such a surface if at any time a different class of work should be desired.

Throughout the directions for undercoats on all classes of work it will be found that varnish is specified in place of oil and japan. This gives the most satisfactory undercoat surface that can possibly be made, especially if a good grade of varnish is used. The work will remain in good condition for an indefinite length of time; it will not crack or check; the grain of the wood will be thoroughly filled and with this method of reducing the paint, the number of coats to produce satisfactory work can be cut down.

Mixtures of japan and oil for undercoats are not always satisfactory for interior work. Too much oil makes spongy work which is liable to crack and check badly. Heavy mixtures of oil and japan will do likewise.

The directions given are not new but have been tried out in the most practical ways and have always proved entirely satisfactory.

Sandpaper or smooth the surface with fine steel wool and dust off thoroughly before applying the paint.

Where paint, enamel or varnish are retarded in their drying by weather conditions or other causes, the work can be assisted in drying and hardening by sandpapering or mousing off, killing the gloss and allowing it to be exposed to a free circulation of air. This will harden work in a few hours as much as if allowed to stand for a considerable length of time.

Cheap paint should not be used for inside work any more than on the exterior of the building, if good results

Interior Finish, New Work. Protection and Preparation of the Surface—Continued.

are to be expected. It is a mistake to use cheap oil for priming. The same paint, or something as good, should be used for priming or first coat as is used for the finishing coats or for building up the ground work for enameling, graining and like work.

OIL PAINT. IN WHITE.

Where two coat oil paint work is specified, without sizing, the first coat should be reduced with half turpentine and half oil to a good consistency, then a half pint of good hard drying or enamel varnish added. This will dry hard and will not spot as badly on soft pine wood as a turpentine oil reduction. After it is hard dry, putty crevices and nail holes with good putty, one which will not turn yellow; or the puttying can be done before the priming coat is applied. Should there be holes that are not properly filled, they can be repainted over the first or priming coat. Sandpaper or rub with fine steel wool to a smooth, even surface, dust off and apply a second coat mixed to a good, heavy consistency with half oil and half turpentine, or 1-3 good hard drying varnish, 1-3 oil and 1-3 turpentine. Either mix will dry with a good gloss and can be washed. Do not use Denmar Varnish.

For three coat work the primer should be mixed as before stated, the second coat mixed with three parts turpentine and one part oil or hard drying varnish. This will dry with an eggshell gloss. Sandpaper or rub with fine steel wool to a smooth, even coat and apply the finishing coat of medium consistency, mixed with half turpentine and half oil, or 1-3 each turpentine, oil and varnish. This should dry with a good gloss and can be scrubbed. This work, however, will turn yellow with age, as will enamel if applied over it.

GLOSS WORK. WHITE.

Satisfactory two coat gloss work can not be done on bare wood. If the work is not filled or sized, the primer should be mixed to a thin consistency with $\frac{1}{4}$ turpentine and $\frac{1}{4}$ hard drying or enamel varnish. The second coat should be of the same mixture but of heavier consistency. If for a sized or filled surface, the first coat should be of

Interior Finish, New Work. Protection and Preparation of the Surface—Continued.

the same consistency and mixture as for second coat over bare wood. This will dry flat. Sandpaper or rub with fine steel wool to a smooth, even coat.

If the work is to be finished in lead, use 1-3 of the second coat flat mixture and 2-3 hard drying or enamel varnish. If a white finish is desired, zinc in place of lead should be used. For zinc finish, prime with lead reduced with before stated. Second coat with zinc in Damar reduced with turpentine. Sandpaper between coats and finish with 1-3 second-coat zinc mixture and 2-3 white or enamel varnish. Either of these finishes will dry with a good gloss and should not turn yellow or check.

OIL PAINT.

IN TINTS.

Reduce the priming coat with half turpentine and half oil. To one gallon of paint add a half-pint of good varnish. The paint should be of good consistency and applied smoothly and evenly. When hard dry, sandpaper, dust off and apply a coat mixed as before stated, only of a heavier consistency. This paint will dry with sufficient gloss to allow of washing.

For three-coat work the primer should be mixed as noted and the second coat mixed with three parts turpentine and one part oil. This will dry about flat and can be sanded smooth before applying the finishing coat which should be mixed with half turpentine and half oil. To a gallon of the mixture add a half-pint of good mixing varnish; this should dry with fair gloss and can be washed or scrubbed.

GLOSS WORK.

TINTS.

The primer can be mixed with half oil and half turpentine. It is safer to cut down the amount of oil, using 2-3 turpentine and 1-3 oil. After the priming is thoroughly hard, putty and sandpaper and apply a coat of flat color of good consistency. When hard, sandpaper to a smooth, even surface and apply a coat of 1-3 flat color and 2-3 good color mixing varnish. This paint should be flowed on smoothly and evenly. It will dry with a good gloss and make a very satisfactory finish.

PRACTICAL PAINTING.

Interior Finish, New Work. Protection and Preparation of the Surface—Continued.

FLAT FINISH.

THREE COATS.

A satisfactory flat finish can not be obtained with less than three coats unless the wood has been filled or sized. The priming coat for bare wood should be mixed to a thin consistency with $\frac{1}{2}$ turpentine and $\frac{1}{4}$ varnish. Putty with good, hard drying putty, one which will not show gloss spots or turn yellow. Sandpaper or rub with fine steel wool to a smooth surface. The second coat should be mixed to a heavier consistency, carrying a little larger percentage of varnish so as not to leave a surface which is too flat. This same mixture should be used for the first coat over a surface which has been filled or sized. (If for white work, white enamel varnish should be used where varnish is specified.) Rub smooth with curled hair, dust off and apply a finishing coat mixed flat. This will dry without gloss spots. It can be mixed with either lead or zinc, according to the specifications, also white or tints according to the work desired.

If a dead flat finish is desired, when lead is used, the lead should first be washed with turpentine. If a zinc finish, use zinc in Damar reduced with turpentine.

ENAMEL.

THREE-COAT WORK.

The priming or first coat should be mixed according to directions for flat work. If the lead used is soft ground, it should be washed with turpentine and allowed to stand over night and the turpentine poured off in the morning. Reduce the paint with all turpentine to which reduction should be added 1-32 to 1-16 gal. of the enamel to each gal. of paint. This will assist in hardening the paint and the mixture can be used either on bare wood or over a sized surface. When the priming or first coat is thoroughly hard, putty with good hard-drying putty, one which will not turn yellow, then rub with fine sandpaper or steel wool, after which apply a second coat mixed flat, to which has been added a pint of the enamel to a gallon of paint. Rub this coat smooth with fine sandpaper or curled hair. Apply a good, smooth, even coat of enamel of good consistency. If properly applied, the enamel can be left in full gloss finish or lightly rubbed. If a higher finish is desired, reduce the first coat of enamel with a small amount of turpentine (one pint to the gallon

Interior Finish, New Work, Protection and Preparation of the Surface - Continued.

of enamel.) Rub this coat with fine steel wool to kill the gloss and level down the surface, then flow on a smooth, even coat of enamel. This can be rubbed to the finish desired and polished after three to four days' standing. If desired, zinc can be used for the flat coats in the foregoing directions; however, it is best to use lead for building up undercoats.

ZINC FINISH.

The priming coat for zinc should be as directed for flat work. Lead is best to use for priming or first coat over a sized surface. Where two or three coats of flat zinc work are specified, reduce zinc that has been ground in Damar Varnish with turpentine to a medium thin consistency and apply over a first coat of lead. When dry, rub with curled hair and apply a second coat of the same mixture of a heavier consistency. This will dry flat and make a beautiful finish.

If a gloss finish is desired, apply the finishing coat of zinc in Damar reduced with turpentine to the consistency of varnish. To one part of this mixture add two parts white enamel varnish. If a higher finish is desired, rub this coat with fine steel wool and apply a coat of clear varnish. This can be rubbed to the desired effect.

EBONY OR FLAT BLACK FINISH.

Where work is to be finished in ebony, either in gloss or flat, the wood should be prepared according to the finish. If soft wood and is to be finished in ebony, it should receive a coat of shellac; putty with black putty and apply a coat of dark lead color, mixed flat, to which has been added a half-pint of good hard-drying varnish to the gallon of paint. When hard dry, rub off smooth with curled hair. Over this apply a coat of flat black. If a gloss or polish is desired, apply a coat of black color and varnish or ebony finish. This can be rubbed to a dead effect. If a more expensive finish is desired, slightly reduce the first coat of varnish color or ebony finish, according to the temperature of the room. When hard dry, cut down smooth with fine steel wool, dust off and flow on an even coat of the color varnish or ebony finish. This can be rubbed and polished.

Where grill work, plate rails, etc., of hard wood are to be finished and the open-grain effect is desired, add to the flat black a few drops of oil and apply a coat to the bare

Interior Finish, New Work, Protection and Preparation of the Surface - Continued.

wood. Allow to stand a short time, then wipe off to the desired effect of flat black or Flemish finish. If, however, the hard wood is to be finished in gloss or polish, it should first be filled with paste filler; then proceed as with soft wood varnish coats, leaving off the dark lead color coat.

CUPBOARDS AND PANTRIES.

When cupboards and pantries are to be painted, the first or priming coat should be applied to the bare wood and mixed with 2-3 turpentine and 1-3 oil. This will dry hard and can be sandpapered smooth. If two coats only are to be applied, the finishing coat should be mixed to dry hard and firm. If oil paint, it can be mixed to a good consistency with 2-3 oil and 1-3 turpentine and a small amount of good Japan, or mix the desired color flat and use half color and half good-drying varnish. The paint should be of the same consistency as varnish. To this a further percentage of turpentine can be added to insure ease of working, or a small percentage of oil can be used, but not enough to cause the paint to dry tacky.

If three coats of oil paint are specified, the second coat should be of the same mixture as the primer, but of a heavier consistency. When hard, sandpaper and apply a coat of paint mixed with 2-3 oil and 1-3 turpentine. If sufficient time is allowed, this should dry firm and hard. If a varnish finish is desired, the finishing coat varnish color can be applied as recommended for two coat work.

In painting the pantries, cupboards, etc., it is very essential that the doors and drawers should not be closed, so as to allow the paint drying hard. A free circulation of air is absolutely necessary.

GRAINING GROUND.

Graining grounds which are mixed with all oil are very liable to crack and check after varnish has been applied over them. Care should always be used in noting that the undercoats are thoroughly hard before applying subsequent coats. There should not be too much oil used.

If the priming is to be applied to the bare wood, reduce with half oil and half turpentine. Allow this to thoroughly harden through, putty, sandpaper smooth and apply a coat of paint, mixed flat, to which has been added a half-pint of hard-drying varnish to the gallon of paint. When hard, rub smooth with fine sandpaper or steel wool and apply a coat

Interior Finish, New Work, Protection and Preparation of the Surface—Continued.

of the same paint with the addition of varnish to allow of drying with a slight gloss, or a small amount of oil can be used, but not enough to cause the paint to dry tacky. If the surface has been sized, the first coat should be mixed with 2-3 turpentine and 1-3 oil, smoothed off and finished with one coat as recommended for finishing on bare wood. Graining color can be worked over this ground without danger of cutting through with the graining combs or when cutting out growths, as is often the case when oil is used in ground work.

It is best to grain in distemper for interior work. For exterior work, more oil can be used for building up the ground work than for interior. However, if the work is to be varnished, most of the oil should be cut out. A great many painters prefer not to varnish exterior work, but apply a coat of oil, rub off with a soft cloth and let the work remain with this finish. Where varnished work is used on the exterior, the graining should be done in distemper if possible, or the oil graining color should be allowed to stand until thoroughly hard before applying the varnish; this insures against blistering and cracking.

FLOORS—INTERIOR.

Where the priming can be allowed to stand a sufficient time to thoroughly harden, the paint can be mixed with half turpentine and half oil. Where time will not permit, 2-3 turpentine and 1-3 oil should be used. Floor paint should dry hard, remembering that the priming or foundation coat is very important. After hard dry, putty and apply a second coat of putty mixed with 2-3 turpentine and 1-3 Copal or mixing varnish. This will dry hard with a slight gloss. Sandpaper and dust off and apply a coat of the same shade mixed with 2-3 varnish and 1-3 flat color. This will dry with a good gloss and can be used without fear of scratching or peeling if the varnish used is of good grade. After the floors have been used and have become somewhat worn, they can be renewed by washing clean and applying a thin coat of floor finish. This can be repeated as often as the floor shows wear.

STAINING.

Where it is possible, the wood should be stained before being nailed to the wall or as soon as the carpenter has finished dressing. This will save time and labor in finishing.

Interior Finish, New Work, Protection and Preparation of the Surface—Continued.

The stain should be of thin consistency so as to penetrate into the wood and not remain in spots on the surface. Allow the stain to remain on the wood a short time, then wipe off with a cloth to even up the work. On very soft pine, it is often necessary in order to produce uniform work to size the same with a thin sizing before staining. This size should be very thin, and it is well to wipe it off immediately after applying so as not to have an excess on the surface, thus keeping the stain from striking in and the soft and sappy places from absorbing so much of the stain as to make the finished work spotted.

Where size is used, the stain should be allowed to remain on the surface longer than on the bare wood so as to allow of good penetration before wiping off. It is not necessary to wipe if care is used in brushing on the stain. Where it is not possible to stain the wood before nailing to the wall, the work should be thoroughly dusted, then puttied. Knife the putty into nail holes, cracks, etc., after which apply the stain. Allow the stain to remain on the surface a short time, then wipe off to even up the work. When hard, sandpaper lightly and apply a shellac or liquid filler. When hard, rub with fine sandpaper or fine steel wool to a smooth, even coat, after which apply varnish, the number of coats depending on specifications.

CUPBOARDS AND PANTRIES.

Where cupboards and pantries are to be stained inside on the shelving, inside drawers, etc., they should receive a coat of shellac or good liquid filler over the stain, then a thin coat of hard-drying varnish, one which is not easily affected by heat, otherwise there is danger of warm dishes or other utensils sticking to it.

FLOORS.

Where floors are to be stained and finished, they should be stained and protected according to instructions previously given. Where these instructions have been followed, and as soon as the interior is finished, remove the paper and dust off the floors. If there should be dust from the plastering which cannot be removed with a duster, dampen a cloth with a mixture of half turpentine and half oil and with this remove all the dust and leave the floors clean. Do not have enough of the mixture on the cloth to make the floor oily—

Interior Finish, New Work, Protection and Preparation of the Surface Continued.

just a sufficient amount to take up the dust. If shellac is to be used over the stain, use turpentine for cleaning. Apply over this stain a thin coat of shellac or good liquid filler. Rub off lightly with fine sandpaper or steel wool and apply a coat of floor finish. This can be left in the gloss, rubbed with pumice stone and oil, or sandpapered to kill the gloss, then waxed in the usual manner.

Should a deeper stain be wanted or the floor be marred or scratched, use a mixture of 1-3 stain and 2-3 floor finish. If the floor has not been protected before the plastering was done, it should be thoroughly cleaned, the mortar scraped off, sandpapered and dressed down smooth and the cracks filled with crack and crevice filler or putted with good putty; then apply a coat of stain, after which the floor can be finished as noted.

WALLS.

TO PAINT PLASTERED WALLS.

Plastered walls should receive a coat of size before painting. The best size which can be applied to a wall is a thin coat of oil paint. This is hard to apply without showing laps, but these can be easily covered with subsequent coats. When hard dry, apply a coat of warm glue size which will fully stop absorption.

If the walls are to be painted in oil with a full gloss, they should receive the finishing coat of a full oil reduction. If to be half flat, the finishing coat should be mixed to a good consistency with half turpentine and half oil. This will cover the work in a solid manner and make good two coat work.

If a varnish size is used, reduce a fair grade of hard oil finish or varnish to a thin consistency and apply freely with a full brush. When hard dry, apply a first coat mixed with half oil and half turpentine.

If a full gloss is desired, the finishing coat of full oil reduction can be applied over this surface, or, if half flat is wanted, the same mixture as for first coat can be applied, but must be of a heavier consistency.

If the walls are to be finished flat, three coats over a size must be applied. If an oil paint and glue size are used, a second coat mixed half flat will produce a satisfactory foundation for the flat color.

If varnish size is used, apply two coats of half flat paint, the second coat of a heavier consistency than the first coat.

Interior Finish, New Work, Protection and Preparation of the Surface Continued.

If to be left flat, apply one even coat of flat paint mixed to a good consistency.

If to be stippled, the paint should be mixed flat to a heavy consistency, carrying a small percentage of varnish.

In applying a flat color on large rooms, two men should work together in order to avoid showing laps. In stippling large surfaces, it is customary for two men to apply the paint and one man to follow with the stippler.

Where the walls are to be stippled in oil paint, the finishing coat should be mixed to a heavy consistency with 2-3 oil and 1-3 turpentine. Apply the paint medium heavy and allow it to stand a short time, then proceed to stipple. One man can apply the paint as well as do the stippling.

PROTECTION OF WALLS.

Where walls have been stippled or decorated, they can be protected by applying a thin coat of good starch. Boil the starch and strain. Be sure it is uniform throughout, then reduce to a thin consistency and apply a thin coat and stipple the same as with paint. This will protect the decoration, and after it becomes soiled with smoke it can be washed off and another coat of starch be applied in the same manner as before, thus saving the decoration for an indefinite length of time.

INTERIOR FINISH - OLD WORK.

In repainting a surface that has been painted, varnished, enameled, or stained a number of times, it is important to know the character of the surface to be finished, the kind of work that can be satisfactorily done over it, also necessary to know how to properly prepare the surface to receive the finish, as well as to know that certain kinds of work can not be successfully done over numerous coats.

Flat white and enamel can not be applied over numerous coats of oil paint, as they will turn yellow and are liable to crack. Grained work can not be successfully done over an enameled surface, as the surface is so hard and brittle that when oil graining colors are used, it is liable to break loose, chip, crack or check. A surface which has been enameled can not be successfully refinished except in enamel. The only satisfactory way to remove enamel is with paint remover or to burn the surface.

Painting can not be done over numerous coats of varnish without danger of checking or cracking, therefore the varnish should be removed before the paint is applied. Where numerous coats of oil paint have been applied and are of a spongy character or have not dried solid, the surface should be burned or the paint taken off with a paint remover. If the surface is cracked or alligatored, it should be cleaned to the wood with a burning kumpp or paint remover. If the work is badly cracked and will not permit of burning, it should be painted in flat color. Cracks will not show so badly finished in flat as in gloss.

OIL PAINT.

Where oil paint is to be used over old work, sandpaper the old paint to a smooth surface and apply a coat mixed with half turpentine and half oil. If more than one coat is desired, the second coat can be applied of the same paint mixed to a heavier consistency; however, one coat is usually sufficient over old paint. It is not necessary to apply extra coats if the color used is of a similar shade to the old paint. A well covered surface can be made with one coat. Avoid applying more paint than is absolutely necessary to produce a solid finish.

GLOSS FINISH.

If the work is to be refinished in gloss, clean the surface and sandpaper or rub with steel wool to a smooth surface,

Interior Finish, Old Work—Continued.

then apply one coat of enamel or gloss finish as directed for new work, finishing coat.

FLAT AND ENAMEL FINISH.

If the work has received two or three coats of oil paint which have dried solid without signs of cracking or checking, it can be repainted with fair results if first sandpapered smoothly, then covered with a coat of paint mixed flat. When this is hard dry, apply a second coat if necessary; however, if the one coat will produce a satisfactory finish, it is all that should be applied. If an enamel finish is wanted over this same surface, the enamel can be applied over the flat color. The first enamel coat should be reduced with a pint of turpentine to a gallon of enamel. When hard, rub the surface with fine steel wool to cut the gloss and level the surface, then apply a smooth, even coat of enamel, using a full brush and flowing on the enamel. This can be rubbed or left in a gloss finish.

If the work is to be painted or enameled white and the surface has received numerous coats of oil paint and good results are expected, the old paint will have to be removed. Then the surface, if thoroughly cleaned and sandpapered, will be in good condition to receive paint and should be treated in the same manner as new work which has not been sized.

To enamel over a varnished surface, it is very necessary to remove all of the varnish. The ground work for enamel should be built up with a portion of the enamel or a good mixing varnish added to each coat. The paint should be mixed flat, with the enamel or varnish added. The first coat should contain from 1 pint to 1½ pints of enamel to a gallon of paint. Apply the second coat of the same mixture of a heavier consistency. Each coat should be thoroughly sandpapered or rubbed smooth with steel wool before applying another. The third coat can be applied with a good enamel reduced with a pint of turpentine to a gallon of enamel. If a deeper luster is wanted, apply a heavy coat of enamel of the original consistency. This can be rubbed to a flat finish or left in the gloss. If the enamel used is of good quality and the undercoats of varnish are not of a cheap rosin quality, this work will not check nor crack.

KITCHENS AND PANTRIES.

Kitchens and pantries, to be repainted, should be thoroughly cleaned. The best way is to wash the woodwork and

Interior Plumb, Old Work—Continued.

walls with rain water and washing compound, using $\frac{1}{4}$ pound of washing powder or soda to three gallons of rain water. Thoroughly sponge and brush the surface, then rinse with clear water. This will remove smoke or grease more readily than will turpentine or benzine. For the walls of the kitchen or pantry to be repainted, the first coat should be mixed half flat, then apply a full oil coat of a flat color mixed with varnish, in the proportion of 1-3 color and 2-3 mixing varnish. Either of the foregoing will dry with a good gloss and can be washed.

The woodwork should be thoroughly sandpapered, and, if in very bad condition, scraped. If the old paint is thoroughly hard and two coat work is necessary the first coat should be mixed half flat, then a full oil coat applied over this, or flat color and varnish in the proportions directed for wall work.

Shelves in cupboards and pantries should be thoroughly washed, sandpapered and then a coat of flat color applied. The finishing coat should be mixed with varnish and flat color to dry hard and solid so as not to be softened with moderate heat. Very warm cooking utensils are often placed in pantries and on shelves, and if the paint is not hard dry this is liable to soften it.

KITCHEN AND PANTRY FLOORS.

Floors should be scrubbed three or four days before paint is applied. If there are any grease spots, wash them with turpentine or benzine. The first coat of paint should be mixed to dry firm and hard in the wood. Reduce lead in oil with 2-3 turpentine and 1-3 good Copal or mixing varnish. When hard, sandpaper lightly, dust off and apply a coat of 2-3 mixing varnish and 1-3 flat color. This will dry with a good gloss, firm and hard and make a coating which is not in danger of being scratched or scuffed up.

GRAINING GROUND.

If the surface has been previously painted and is in good condition, thoroughly sandpaper and apply a coat of paint mixed flat and tinted to the proper ground color with a pint of hard-drying varnish added. Should the paint dry too flat for good working or combing of the graining color, an additional amount of varnish can be added, or a small amount of oil. If numerous coats of oil paint have been applied, or if

Interior Plumb, Old Work—Continued.

the surface is badly cracked, the paint will have to be burned or removed with paint remover; then proceed as with new work.

Where graining is done over an old varnished surface, it is best to remove the varnish before applying the paint to avoid cracking; however, if it is impossible to do so, the ground work can be mixed to a semi-paste with a good mixing varnish, then reduced to a painting consistency with turpentine. A small amount of oil can be used should the color not work freely, but not to exceed four ounces of oil to the gallon of paint. Should the paint dry too flat for good working or combing of the graining color, an additional amount of varnish can be used in the second coat to produce an egg-shell or semi-gloss, whichever is desired.

STAINING.

If a surface which has been previously painted or varnished is to be stained, it must be handled and built up with the proper shade of ground color according to the wood to be imitated in the same manner as a similar surface for graining ground. The stain must be of a heavier consistency than for bare wood. Brush out thin and even. It can not be wiped off as on new work and the effect depends upon the brushing. If the grain of the wood is to be imitated, the surface must be grained.

DRYING.

It should be borne in mind that light and air are necessary to the drying of paint. Paint will not harden in tightly closed rooms. This is especially true of kitchens, pantries and work of this character where there are numerous shelves, drawers, etc., and if closed the paint or varnish will remain tacky and not harden through.

Floors which are to be painted should be exposed to a free circulation of air from underneath. If they are over damp basements or cellars, the windows or ventilators of same should be opened to allow of free air circulation from underneath, as dead or damp air will prevent the paint or varnish on floors from hardening.

THE HEATH & MILLIGAN PAINTS.

The following pages are devoted to directions for use of The Heath & Milligan Products:

So much depends upon proper application in order to obtain satisfactory results in the use of paint that we consider it due our customers to provide directions for the use of our different products and in this manner do our part towards insuring the desired results.

While it is impossible to furnish directions which cover the proper use and application of paint under all conditions, still we have made our directions as specific as possible, aiming to cover to the fullest extent the most important points. To give full and explicit directions for the treatment of the various surfaces and for the uses of The Heath & Milligan Paints would be but a repetition of the information given under the various headings in the first part of this book.

The Heath & Milligan Paints are practical painters' paints, so manufactured and prepared that they stand the necessary tempering to meet the various conditions under which paint is applied, and in the use of these products the foregoing information should be carefully considered and adopted as part of the directions for the proper use of The Heath & Milligan Paints.

The Heath & Milligan Paints are manufactured with a practical knowledge of the requirements of paint. From 1851 to 1879 the firm of Heath & Milligan operated in conjunction with their manufacturing business one of the largest painting and decorating departments in the United States, and many of the practical painters of to-day can look back to the time when they either served their apprenticeship or time with the firm of Heath & Milligan.

It is the knowledge gained in not only more than half a century of careful study in the manufacture of the goods, but the working under practical conditions that has given perfection to The H. & M. Line.

We attribute our success to the support of thousands of practical painters over the entire country, many of whom have at one time been associated with us, together with a scientific knowledge of requirements, gained through practical use of the goods.

We solicit in this work the co-operation of all practical painters, both by carefully following our directions and by calling our attention to any valuable information which has not been included in these directions so that we can embody it in our next edition.

AMOUNT OF PAINT REQUIRED FOR A GIVEN SURFACE.

Ascertain the number of square feet of surface to be painted, as shown under the heading of "How to Measure or Estimate a Surface." See pages 5, 6 and 7.

BEST PREPARED PAINT. White or Light Tints: One gallon best Prepared Paint, reduced and applied according to directions, will cover over a smooth or fair surface 300 square feet, two coats. Dark tints or solid colors, Crimson, Red, Red Brown, Tuscan, Maroon, Crylight Green, Myrtle Green and Black, applied according to directions, will cover 450 square feet, two coats.

BEST PREPARED PORCH AND FLOOR PAINT, reduced and applied according to directions, will cover from 250 to 300 square feet, two coats, according to the condition of the surface.

CREOLITE. "The Most Perfect of Floor Paints," will cover 200 to 300 square feet, two coats, depending upon the condition of the surface.

INL ROOF AND BARN PAINT and MOSS GREEN ROOF PAINT: One gallon reduced and applied according to directions will cover 300 square feet, two coats, on barns or structural work, the lumber of which has been dressed. For new shingle roofs, figure a gallon reduced according to directions to cover a square, two coats. For old shingles no definite amount can be given, as all depends upon the condition of the shingles. Old, weather-beaten shingles require from $\frac{3}{4}$ to one gallon of properly reduced paint to cover a square, one coat. For dipping shingles, two gallons reduced according to directions will dip 1,000 regulation shingles 11 inches. On a tin or metallic surface, one gallon reduced and applied according to directions will cover 450 square feet, two coats.

For a gloss finish on brick work or for flat brick red under coats, INL will cover, when reduced and applied according to directions, from 200 to 400 square feet, one coat, according to the porosity of the surface.

DURABLE FLAT BRICK RED: If undercoats are of INL Roof and Barn Paint, note the foregoing information as to the amount required for a given surface. If Best Venetian Red in Oil is used for undercoatings, figure from $2\frac{3}{4}$ to $3\frac{1}{2}$ pounds, according to the porosity of the surface, to cover a square one coat reduced according to directions.

DURABLE FLAT BRICK RED: 2 pounds, reduced according to directions and applied over a suitable undercoating, will cover a square.

Amount of Paint Required for a Given Surface—Continued.

BEST GRAPHITE PAINT IN PASTE AND LIQUID FORMS. 2 lbs. of Best Graphite in paste form, reduced and applied according to directions, will cover a square, one coat. One gallon of Liquid Graphite will cover 600 square feet, one coat.

RAILWAY WHITE LEAD: To ascertain the amount of Railway White Lead required to paint a given surface, figure $3\frac{1}{2}$ lbs. to the square, two coats.

SOLID COLORS: GREEN, TUSCAN RED, INDIAN RED and VENETIAN RED, ground in oil, when used as *trimming* or body colors, can be figured from $2\frac{1}{2}$ to 3 lbs. to the square reduced to painting consistency.

GENERAL DIRECTIONS.

If a new surface, carefully consider the character of the surface to be painted and whether two or three coats are necessary in order to produce satisfactory work. Study the character of the lumber as to its drying and absorbing properties. Reduce and apply the paint accordingly.

Knotty, pitchy and sappy places should receive a thin coat of shellac before painting.

After priming, putty all nail holes, cracks and crevices with good, hard-drying putty.

If an old surface and it is to be repainted, remove all grease, dust, dirt and loose paint. Carefully consider the condition of the old coats as to hardness and porosity. Examine the surface and determine whether the undercoats are properly bound together and the priming coat adheres solidly to the surface. If an oil or other cheap primer has been used, look out for spots which have received a heavy coat and are ready to break loose.

Examine the surface and determine whether there is dampness from wet basements, down spouts or wet soil. Wash mildewed places with turpentine. Look out for previous coatings of shrivelled paint. See whether the old paint has checked or cracked in fine hair lines. (This does not seem dangerous; however, if the previous coatings have cracked or are peeling, the surface must be cleaned and treated accordingly to its condition.) Reduce and apply the paint with judgment.

If a liquid paint is to be used, thoroughly shake the package before opening; if a sealed can, remove the slip cover and carefully note any printed directions under it. Cut out the full soft end. The cover on our sealed cans, being thin tin, is easily cut with a can opener or pocketknife. Our friction-top pry-open cans are easily prised open with a coin or nail. Remove the entire top of buckets and barrels so as to facilitate the stirring process.

Paint can not be thoroughly stirred with a round stick, neither can it be thoroughly stirred by a circular motion nor through a bung-hole or small opening. Use a flat paddle for stirring, of a width proportionate to the size of the package, always stirring from the bottom up.

INCORPORATING A LIQUID PAINT: Provide a mixing keg or pot proportionate to the size of the mixture. Allow plenty of room for stirring and thoroughly incorporate the paint, allowing sufficient space for the addition of necessary

General Directions—Continued.

thinners. Should any pigment remain in the bottom of the package after thoroughly shaking, pour out about half of the contents into the mixing keg or pot. When the remaining half is thoroughly stirred from the bottom up, gradually pour the contents into the larger receptacle, continuing the stirring until the paint is of a uniform consistency. A liquid paint should not be used out of the original package, as there is not room for thorough reincorporation or proper reduction.

REDUCING AND MIXING A PASTE PAINT. Use a mixing keg or package of sufficient size to hold all the paint required for each coat, allowing room for stirring; through this means the paint for the entire coat will be uniform. In mixing or breaking up the paint, use a flat paddle as large as can be handled to advantage. Paint can not be thoroughly stirred with a round stick nor by a circular motion. It must be stirred from the bottom up to thoroughly combine the oil and pigments. The thinners should be gradually added to insure a smooth and uniform mixture. If all the thinners are dumped in at once, the mixture will be lumpy, necessitating straining before using. When it is practicable, break up the paint the day before it is to be used, reducing it with part of the oil to a heavy paste consistency. The next day add the balance of the thinners, Japan first and then the oil and turpentine. When necessary to use Japan, get only the best, and use it sparingly. Buy a turpentine Japan bearing the name of a reputable manufacturer.

LIQUID PAINTS, STAINS, ETC., should not be left exposed to the air, while in the package, otherwise they may become fatty and gummy. This makes them work hard under the brush, retards their drying, and in some cases causes them to run. To prevent this, put the slip covers or friction tops back in place when not in use. Buckets and barrels should be kept covered with a piece of heavy canvas forced down closely over the top by the use of a hoop.

REDUCTION should be made according to the condition of the surface. Owing to the varied character of the same lumber, definite instructions can not be given for the treatment of each class. The number of coats to be applied to a surface in order to produce satisfactory results should be determined after a careful examination of the surface and the priming coat reduced accordingly. There is no economy in attempting to cover a surface with two coats when three are necessary. A finishing coat piled on to hide the surface and grain of the wood will not properly bind, will soon crumble

General Directions—Continued.

or break away and leave a treacherous surface for repainting. The reduction should be made with oil and turpentine according to the condition of the surface. On old work no definite rule can be given as to the necessary amount of reducers. The paint must be reduced with judgment according to the condition of the surface. For parts which are old or weather-beaten, the paint must be reduced with more oil, while for protected or non-absorbent surfaces more turpentine must be used to form proper binding and penetration.

IMPORTANCE OF THE PRIMING COAT: This should be of the same material as the finishing coats. Use as much care in applying the primer as you would the finishing coat. The paint should be thinned according to the requirements of the surface to be painted, bearing in mind that the wood must be satisfied and that where soft woods are to be painted more linseed oil should be used in reducing the priming coat than for hard, non-absorbent woods. In priming close-grained, non-absorbent woods, a larger percentage of turpentine must be used to assist in killing the sap, as well as giving better penetration than for soft woods.

Don't be afraid of getting the priming coat too thin. It must be thin enough so that it will be readily absorbed, thus satisfying and filling the surface. If the surface is properly filled, it will stop absorption of subsequent coats, bringing out the full body of the paint. Don't be afraid to use turpentine in priming coats; it assists penetration and forms a much better binder between paint and surface. Never use benzine or gasoline in reducing the priming coat nor for any subsequent coat, as they are not penetrators, but evaporate on the surface, leaving too much pigment without proper binders. Remember, the primer is the foundation upon which the lasting qualities of after coats depend.

GREEN OR FATTY LUMBER: Judgment must be used in reducing paint for priming coats over green or fatty lumber. For liquid paints the reduction varies from the directions given under the heading of "Primer." For Normal Conditions to a full turpentine reduction according to the run of the lumber. If the lumber is exceedingly rich or fatty, reduction must be made with turpentine only, at the rate of $\frac{1}{4}$ gallon of turpentine to a gallon of Best Prepared Paint. For paste paint, the reduction should be made with turpentine at the rate of 25 to 40 per cent of the total amount of thinners used.

BRUSHING: Do not apply the paint too heavily. Use

General Directions—Continued.

plenty of "yellow grease." The paint must be thoroughly brushed in and worked out under the brush. In the thorough and careful brushing of the coat rests, to a certain extent, the success of the paint as to its wear and protection of the surface to which it is applied.

DRYING: Be sure the undercoatings are hard dry before applying subsequent coats.

Middle or finishing coats applied over a surface which is not thoroughly dry will not properly dry. They will dry from the surface down, while they should dry from the bottom out.

Paint that has not hardened through and is soft underneath allows sinking in of both the middle and finishing coats. This will cause the paint to lose its gloss.

If paint begins to dry slowly from the bottom and a more rapid oxidation takes place on top, forming a skin, there will be a soft coat between the two, and as drying takes place in the center the top skin or coating will be drawn, thus causing the paint to crinkle.

If satisfactory results are to be expected, sufficient time must be allowed for each coat to thoroughly harden through before applying subsequent coats.

For inside work, light and air are necessary for the proper drying of paint, stain or enamel. When set dust free, open doors and windows, admitting of a free circulation of air.

Never paint during or immediately after rain, frost, fog, heavy mist or dew.

CAUTIONS.

Do not expect the paint to do all the work. It won't. No paint manufacturer can make ONE paint which will meet every requirement.

Judgment must be used as to the surface to be painted. Never use a cheap primer. The priming coat should be of the best. It is the foundation upon which all subsequent coats must be built.

The best paint, if improperly applied or applied over a surface not in condition to receive paint, will not give good results.

A successful painter is one who makes a thorough study of the work on hand and knows what is necessary to use in order to produce the best results. If oil or turpentine is needed, he should know when and how much.

Good results can not be obtained on poor lumber.

Moisture is the bane of the painter and paint manufacturer. Possibly more trouble can be traced to moisture than to any other cause of paint going wrong.

Paint will blister, peel and scale if the surface painted contains moisture.

Moisture is always present in improperly seasoned or green lumber. It is often present because of defective window casings, leaky down spouts and freshly plastered walls.

It is important that the foundation should have ventilators or windows, so that there will be a free circulation of air underneath the buildings to carry off the dampness. If this precaution is not taken, the dampness will go up through the space between the plastering and siding and the sun and warm air will draw it through to the outside, causing the paint to blister, peel and scale.

Mildew is another serious trouble. This is a vegetable growth and is always a sure indication of dampness. Note information given on Page 65.

Do not be in a hurry with your work. Do not apply the paint too heavily.

A well-brushed-out coat of the proper consistency and plenty of time allowed for its hardening through will more than repay in the after effects for the time spent.

There is a difference between paint drying and hardening. Paint may dry in a few hours, but takes days to harden.

Light and air are essential to the proper drying of paint. With inside painting, do not tightly close the room and expect the paint to dry. It won't.

Cautions--Continued.

You can not get good results on an old surface unless it is put in proper condition to receive paint and the paint prepared and applied according to the condition of the surface.

Paint when struck with frost before it is dry wrinkles and loses its gloss.

Heavy dews on paint not dry also destroy the gloss.

There are certain times of the year when outside painting should not be done if satisfactory results are to be expected.

Do not paint too early in the spring, as the surface is very apt to be full of frost and moisture.

More complaints of peeling can be traced to early spring painting than to painting done at any other time of the year.

All paints and oils are much heavier in cold than in warm weather. If applied in a low temperature, there is apt to be too heavy a coating.

Painting should never be done in extremely hot weather.

Better and more uniform results can be obtained if the full amount of paint required for each coat is mixed at one time.

Prevent the paint from skinning over as much as possible by keeping the mixing keg covered when not in use. The formation of skin robs the paint of its drier.

Paint must be kept of a uniform consistency to give uniform results.

Where Japan is used, always get the best and use it sparingly. Never add Japan last or after the mixture has been thinned down.

An excess of Japan will keep the paint from hardening and make spongy work.

There are very few exceptions to the statement that boiled linseed oil should never be used for undercoatings.

Always use pure raw linseed oil for reducing The Heath & Milligan Paints, except as otherwise specified in our directions. Insist on having the best. See that it bears the brand of some reputable oil crusher.

There are no substitutes for linseed oil.

An excess of oil in the middle coat on new work and first coat on old work will retard the hardening and cause the finishing coat to flatten out, also very apt to cause blistering.

TACKY PAINT. This is more often caused through improper application of the undercoats than through any fault of the paint.

Paint, varnish, or a similar product applied over a glossy surface or a surface which is not hard dry is much more like-

*PRACTICAL PAINTING.**Cautions--Continued.*

ly to remain tacky than if applied over a thoroughly dry, half flat or flat surface.

Some paint pigments are natural dryers, while others are non-dryers. The non drying pigments, when used in painting, if not properly prepared and applied over a suitable surface, are very apt to dry tacky and remain so.

Varnish added to oil paint will cause the paint to remain tacky. Colors in oil mixed with varnish will not harden, but soften under exposure to heat.

Always prime a building before the plasterer commences his work.

Never second or third coat a building while the plaster is drying out. A building should never be tightly closed while the plaster is drying out.

**THE HEATH & MILLIGAN BEST PREPARED PAINT.
A PAINTER'S PAINT.**

THE STANDARD PAINT OF AMERICA.

Made with a practical knowledge and embracing all requirements necessary to meet existing conditions.

Best Prepared Paint is made from the best paint materials possible to obtain. No ingredient can enter into its composition without undergoing a careful chemical test to see that it is up to a standard of our own. The different ingredients are scientifically combined by heavy machinery into a mixture embodying the maximum of uniformity, durability, ease of working, beauty and economy, the essentials most necessary in paint, and which have contributed to its increased consumption and popularity.

Best Prepared Paint is a body paint of a finishing coat consistency, so prepared that it will stand tempering with oil and turpentine to meet the different conditions under which paint must be applied.

Best Prepared Paint is made in sixty rich and attractive shades and is put up in quart, half-gallon and gallon cans; five-gallon buckets, half-barrels and barrels.

We have some practical literature in which we explain among other things why Best Prepared Paint is much better than any possible hand mixture of strictly pure white lead and oil. In this literature we also explain some of the reasons why Best Prepared Paint is the most satisfactory product of its kind on the market. Our exclusive agents will supply you with copies of this literature or we will send them to you upon request.

**DIRECTIONS FOR USING THE HEATH & MILLIGAN BEST
PREPARED PAINT.**

For the amount of paint required on a given surface, note information Pages 129-130.

Prepare the surface and paint in connection with general directions, Pages 131 to 134, inclusive.

Best Prepared paint is a body paint, and to obtain the best results through its use, plenty of "elbow grease" must be applied. The paint must be well brushed out on all coats to insure proper binding, uniform drying and an even surface.

PRIMING COAT: Note the "Importance of the Priming Coat," Pages 68 and 69.

Directions for Using The Heath & Milligan Best
Continued.

THE FINISHING OR LAST COAT: All are heavier in low temperature than in warm. Prepared Paint is of the proper consistency coats if applied in a temperature of 70 degrees. painting in cold weather, 1-16 gallon of turpentine of Best Prepared Paint will assist in proper drying the paint. This amount of turpentine the gloss or life of the paint.

Use only raw linseed oil and turpentine.
Never use boiled linseed oil in Best Prepared Paint.
Never add japan to Best Prepared Paint.

Best Prepared Paint carries the right amount to insure proper drying.

Never paint immediately after a rain storm or heavy mist.

**DIRECTIONS FOR REDUCING BEST PREPARED
EXTERIOR PAINTING—NEW WORK.**

The priming coat is the most important applied to any surface. It is the foundation success of future coats depends. No matter how may be, it can not be held responsible for unsatisfactory results if applied over an ochre or any other color.

The following directions are for the reduction of White and tints when applied in normal temperature on a surface in normal condition, viz.: lumber of good quality, grain, sap and dryness.

Reduce the paint according to conditions of the lumber. Note information, Pages 14 and 15, character of the different lumbers used for exterior work.

If the lumber is not properly seasoned or green, better results will be obtained by allowing the lumber to dry for some time before painting. Where this is not possible, more turpentine used in the priming coat will give better results. If the surface is dry and porous, more paint is used.

Study the character of the lumber and determine the number of coats of properly reduced paint will produce the desired work.

Allow at least six or eight days, according to conditions, for the paint to harden through before the priming and finishing coats.

Directions for Reducing Best Prepared Paint for Exterior Painting—
New Work—Continued.

TWO COAT—NEW WORK.

PRIMER: For Oregon pine, hard pine, cypress, hemlock, ash, chestnut and oak reduce one gallon Best Prepared Paint with:

1 pint raw linseed oil and 1 pint turpentine.

For white pine, poplar, gum, spruce, birch, elm and maple reduce one gallon Best Prepared Paint with:

1½ pints raw linseed oil and ½ pint turpentine.

For Oregon fir, cottonwood and basswood reduce one gallon Best Prepared Paint with:

1 quart raw linseed oil and ½ pint turpentine.

For cedars and redwood reduce one gallon Best Prepared Paint with:

3 pints raw linseed oil and 1 pint turpentine.

FINISHING COAT: Thoroughly mix the paint and apply according to directions given under heading of "Finishing or Last Coat."

THREE COAT—NEW WORK.

PRIMER: For Oregon pine, hard pine, cypress, hemlock, ash, chestnut and oak reduce one gallon Best Prepared Paint with:

1½ pints raw linseed oil and 1½ pints turpentine.

For white pine, poplar, gum, spruce, birch, elm and maple reduce one gallon Best Prepared Paint with:

1 quart raw linseed oil and 1 pint turpentine.

For Oregon fir, cottonwood and basswood reduce one gallon Best Prepared Paint with:

3 pints raw linseed oil and ½ pint turpentine.

For cedars and redwood reduce one gallon Best Prepared Paint with:

½ gallon raw linseed oil and 1 pint turpentine.

FOR SECOND COAT, OR FIRST COAT OVER PRIMER: Reduce one gallon Best Prepared Paint with:

½ pint raw linseed oil and 1½ pints turpentine.

FOR THIRD OR FINISHING COAT: Thoroughly mix the paint and apply according to directions given under the heading of "Finishing or Last Coat."

DIRECTIONS FOR REDUCING BEST PREPARED PAINT FOR EXTERIOR PAINTING—OLD WORK.

No definite rule can be given as to the reduction necessary. Note information as to the proper treatment of various

Directions for Reducing Best Prepared Paint for Exterior Painting—Old Work—Continued.

surfaces, under the heading "Exterior Painting—Old Work," Pages 94 to 107, inclusive.

Reduce and apply the paint with judgment, according to the condition of the surface.

TWO COAT WORK UNDER NORMAL CONDITIONS.

FIRST COAT: To one gallon Best Prepared Paint add:

1 pint raw linseed oil,

1 pint turpentine.

Allow six to eight days for the paint to harden through. Putty after this coat.

FINISHING COAT: Thoroughly mix the paint and apply according to directions given under the heading "Finishing or Last Coat."

BRICK AND STONE WORK.

The surface to be painted should be clean, dry and free from dust, dirt and mildew. If the surface is one which has been previously painted, scrape off all loose particles and see that a good foundation is left for the coats of paint which are to be applied.

Note the information given under the heading of general directions, Pages 131 to 134, inclusive.

No definite rule can be given as to the reduction necessary. All depends upon the condition of the surface, and judgment must be used accordingly. For good results on new work, three coats must be applied. For an ordinary surface, thin and use as follows:

PRIMER: Reduce one gallon Best Prepared Paint with:

1½ pints raw linseed oil and 1½ pints turpentine.

FOR SECOND COAT, OR FIRST COAT OVER PRIMER: Reduce one gallon Best Prepared Paint with:

½ pint raw linseed oil and 1½ pints turpentine.

FOR THIRD OR FINISHING COAT: Thoroughly mix the paint and apply according to directions given under the heading of "Finishing or Last Coat."

One gallon Best Prepared Paint, reduced and applied according to directions, will cover brick or stone surfaces from 200 to 400 square feet, one coat, according to the porosity of the surface.

DIRECTIONS FOR INTERIOR PAINTING—NEW WORK.

The surface to be painted must be clean, dry and free from grease, dust and dirt. Grease and oil stains should be

Directions for Interior Painting. New Work—Continued.
removed with turpentine.

Note the information given under the heading of General Directions, Pages 131 to 134, inclusive.

For all inside work turpentine in place of linseed oil should be used for the reductions.

PRIMER: To one gallon Best Prepared Paint add:

1 quart turpentine.

FINISHING COAT: To one gallon Best Prepared Paint add:

1 pint turpentine.

If three coats are to be applied, reduce the priming coat same as for two coat work. The second and third coats should both be reduced at the rate of one pint turpentine to one gallon Best Prepared Paint.

INSIDE WHITE contains a large percentage of turpentine and should never be used for outside work. For an inside white finish, three coats are recommended. The first and second coats should be reduced at the rate of a pint of turpentine to a gallon of Inside White. The third coat should be applied as found in the package, after thorough mixing.

INSIDE WHITE applied as noted gives an eggshell gloss. Where a flatter effect is desired, the first coat should be reduced with one pint turpentine to a gallon of Inside White; second coat applied as received in the package, after thorough mixing. The third or finishing coat should be reduced with one pint turpentine to a gallon of Inside White.

INSIDE GLOSS WHITE: The first and second coats should be Inside White reduced at the rate of one pint turpentine to a gallon of Inside White. The finishing coat should be of half Inside White and half Inside Gloss White.

If a full enamel gloss is desired, apply the first coat of Inside White reduced with one pint turpentine to a gallon of Inside White; the second coat reduced at the rate of 1/2 pint turpentine to a gallon of Inside White, and the finishing coat of Inside Gloss White applied as received in the package, after thorough mixing.

Ample time must be given for undercoats to thoroughly harden before subsequent coats are applied. Sandpaper and dust off between coats.

DIRECTIONS FOR INTERIOR PAINTING—OLD WORK, OR NEW WORK THAT HAS BEEN SHELLACKED OR SIZED.

The surface to be painted must be clean, dry and free

Directions for Interior Painting. Old Work, or New Work that has been Shellacked or Sized—Continued.

from grease, dust and dirt. If an old surface, it should be evened up and the gloss removed by thoroughly sandpapering. Grease and oil stains should be removed with turpentine.

Note the information given under the heading of General Directions, Pages 131 to 134, inclusive.

For tints, two coats are recommended, reducing both the same, as follows:

FIRST AND SECOND COATS: Reduce one gallon Best Prepared Paint with 1 pint turpentine.

FOR WHITE: If the work has been previously painted white, apply one coat of Inside White as received in the package, after thorough mixing. If used over a light tint, two coats should be applied, both of the same mixture, reduced with 1/2 pint turpentine to a gallon of Inside White. If applied over a dark color, three coats are necessary—apply and reduce as for new work. If a flatter effect or a gloss finish is desired, reduce and apply same as for new work.

NOTE: Never use Inside White for outside work and never use Outside White for inside work. Outside White is ground in and thinned with linseed oil which turns yellow on inside work and should not be used for that purpose.

Note information as to the drying of paint, Pages 75, 76 and 77.

TRIMMING COLORS.

Vermilion is a fugitive color when exposed to the light. It will wear longer and hold its color better if protected with a thin coat of durable varnish. It is intended for a finishing coat only and should be used as found in the package, after thoroughly mixing. The richness will be better brought out if used over a suitable ground color. Fawn or Light Terra Cotta, reduced for two-coat work according to directions, makes a good ground for this color.

Crimson, Red, Red Brown, Tuscan Maroon, Crylight Green, Myrtle Green and Black are made from what are termed solid pigments and are not produced from a white base. These are used principally for trimming colors, and where one coat is used it should be applied as found in the package, after thoroughly mixing. If two coats of Crimson, Red, Red Brown, or Tuscan Maroon are used for either trimming or body color, the first coat should be reduced at the rate of one pint turpentine to the gallon of paint; the finish-

Tinting Colors—Continued

ing coat applied as received in the package.

Crylight Green, Myrtle Green and Black are not fillers and should be used as follows over Best Prepared Paint undercoatings:

BLACK: Prime and second coat with Lead Color Best Prepared Paint, reduced according to directions for three-coat work; finish with one coat of Black as found in the package, after thoroughly mixing.

CRYLIGHT GREEN and MYRTLE GREEN should be used over a primer of Olive Best Prepared Paint, reduced according to directions. If only one coat of Green is used, apply as found in the package, after thoroughly mixing. If two coats are needed, thin the middle or first coat over primer with $\frac{1}{2}$ gallon of turpentine to a gallon of paint, and apply the last coat as found in the package.

TUSCAN MAROON, if applied over a lighter red, will show much more brilliancy and depth than if applied over itself or a light tint. For the undercoating use Red Best Prepared Paint, thinned according to directions.

FLOOR PAINTING.

For the protection of floors; preparing and applying the paint on new and old work, note information given under the heading of "Protection and Preparation of the Surface," Pages 112 to 115, inclusive.

Note information given under the heading of "Floors—Interior Finish, New Work," Page 120.

Note information given under the heading of "Kitchen and Pantry Floors—Interior Finish, Old Work," Page 126.

Note information given under the heading of "Veranda and Porch Floors—New Work," Pages 92 and 93.

Note information given under the heading of "Veranda and Porch Floors—Old Work," Page 106.

THE HEATH & MILLIGAN BEST PREPARED PORCH AND FLOOR PAINT IN LIQUID FORM.

Made with a knowledge of the hard usage such paint must endure. That it fills requirements is shown by the fact that for years it has excelled as the best general floor paint. We were the first to put up and market a paint exclusively for floor painting.

Our Floor Color is the original Floor Paint.

Best Prepared Porch and Floor Paint is a combination of the most durable pigments and thinners known to paint making.

Best Prepared Porch and Floor Paint is especially prepared for painting porch floors, steps, inside or outside floors or stairs, or any woodwork subjected to severe wear.

Best Prepared Porch & Floor Paint is put up in five-gallon buckets; gallon, half-gallon and quart cans.

Best Prepared Porch & Floor Paint is made in seven shades, as shown on the sample shade card.

DIRECTIONS FOR USING THE HEATH & MILLIGAN BEST PREPARED PORCH AND FLOOR PAINT.

For the amount of paint required on a given surface, note information Page 129.

Prepare the surface and paint in accordance with general directions, Page 131 to 134, inclusive.

Best Prepared Porch & Floor Paint is a body paint and must be well worked out under the brush.

If the floor has been scrubbed, let it dry two or three days before painting.

Remove all grease spots by washing with turpentine.

If only one coat is to be used, apply as found in the package; thoroughly brush the paint out.

Two coats are recommended, always being sure that the preceding coat is thoroughly dry before spreading another.

When two coats are to be applied, reduce the first coat with turpentine in the proportion of one pint turpentine to one gallon of paint. For second coat, apply as found in the package.

Never add linseed oil to Best Prepared Porch and Floor Paint. A sufficient amount of linseed oil is ground in with the pigment when the paint is made. Any addition of linseed

Directions for Using The Heath & Milligan Best Prepared Porch and Floor Paint—Continued.

oil will retard the drying of the paint and allow dirt and dust to dry into it.

Never add anything but turpentine as a thinner.

If applied in accordance with directions and under favorable drying conditions, each coat should thoroughly dry in 48 hours.

Paint may be dry on the surface but by no means hard dry. Be especially sure that the first coat has thoroughly dried before applying the second.

"CREOLITE."**THE MOST PERFECT OF FLOOR PAINTS.**

A perfect combination of pigments and thinners, made to meet the demand for a quick-drying, durable paint for inside floors and stairs. Creolite is not intended for outside work. For outside porches and steps use Best Prepared Porch & Floor Paint, see Pages 146 and 147.

For a quick-drying floor paint, two coats of a thin paint like Creolite will give far better results and produce a more durable finish than one or more coats of a heavy paint. Much depends on the surface, but if applied in accordance with directions, one gallon Creolite will cover 200 to 300 square feet two coats.

Creolite is put up in gallon, half-gallon and quarter-gallon cans.

Creolite is made in ten practical shades, shown on sample shade card.

DIRECTIONS FOR USING CREOLITE, THE MOST PERFECT OF FLOOR PAINTS.

Note information under the heading of "Floor Painting," Page 145.

Prepare the surface and paint in accordance with directions, Pages 131 to 134, inclusive.

If the floor has been scrubbed, let it dry two or three days before painting. Oil and grease spots should be removed with turpentine.

Apply Creolite as found in the package, spreading the paint evenly.

Creolite is a thin paint and the first coat applied to bare wood will strike in and fill the surface, bringing out the full body, luster and color of the second coat.

Always allow sufficient time for the undercoat to thoroughly dry before applying a second or third coat of Creolite. When three coats are used, the second coat should be partially flattened by the addition of turpentine at the rate of 1-16 gallon turpentine to the gallon of Creolite.

If applied in a temperature of about 75 degrees with a free circulation of air, Creolite will harden through in about 12 hours.

If a high-gloss finish is desired for living or bedrooms, apply two coats of Creolite and finish with a varnish coat mixture made with 1-3 Creolite and 2-3 Elastic Floor Var-

Directions for Using Creolite, the Most Perfect of Floor Paints—Continued.

nish. This will make an exceptionally good wearing floor, and after it has stood from four to five days the varnish can be lightly rubbed with fine sandpaper or steel wool and the floor waxed in the same manner as hardwood floors, or left in the gloss.

Do not paint floors, then tightly close the room, and expect the paint to dry. It won't.

Never use linseed oil in Creolite. If thinning is necessary, use turpentine only.

"SUNSHINE" FINISHES FOR INTERIOR WORK ON FLOORS, WOODWORK AND FURNITURE.

"Sunshine" Finishes are made of the highest grade of durable varnish and color so combined that when applied to a properly prepared surface they will perfectly produce natural wood effects.

"Sunshine" Finishes embrace the height of durability, beauty, utility and easy working.

"Sunshine" is as durable as it is possible to make a finish of this kind. It renders an elastic coating which withstands the hard usage to which floors and furniture are subjected.

In beauty, "Sunshine" is unexcelled. It is made in ten rich and brilliant colors, which assortment permits of a choice of shades in keeping with any surrounding.

In utility, "Sunshine" is unsurpassed. It is adaptable to every known class of interior woodwork, furniture, brace-a-brac, and especially adapted to floors, over which it makes one of the most durable and beautiful finishes it is possible to obtain. As a furniture and brace-a-brac finish it is the best article made. It gives a perfect finish to new work and makes old cracked and dingy surfaces look like new.

"Sunshine" is so made as to be handled with ease, and if used according to directions the application is simple and results satisfactory.

"Sunshine" is not affected by moisture and dries with a high luster.

DIRECTIONS FOR USING "SUNSHINE" FINISHES.

The preparation of the surface is the most important point to consider. It is not difficult to do satisfactory work if our directions are properly followed as to preparation of the surface and application of the finishes.

The surface must be thoroughly cleaned, dried and sanded. Don't forget your duster. The work must not be hurried and ample time must be given for thorough drying between coats. On old work which requires touching up of spots or worn places, time must be allowed for such places to thoroughly harden before applying the finishing coats.

It is not practical to finish new work of any class without first filling or stopping the suction of the lumber before applying a varnish color. Due to uneven absorption of the lumber, a heavy varnish coat can not be applied over an unfilled surface without showing heavy places, laps and

Directions for Using SUNSHINE Finishes—Continued.

pitting, causing uneven drying and clouding of the grain, thus not producing a uniform transparent finish which is the desire in this class of work.

For floors, the filler used should be very thin so that all pigment or coating can be easily wiped from the surface. If a heavy filler or coating is used, the varnish color can not penetrate into or bind itself to the wood and will not give a firm solid coating with uniform wear. Many complaints about floor finishes can be traced to cheap or heavy coats of filler. No matter how elastic or durable the varnish may be, if it is not properly bound to the wood it can not withstand the severe wear to which a floor is subjected, but will scratch, scuff and be easily affected through use.

As a suitable filler for hard, close-grained wood we recommend a coat of "Sunshine" of the same color with which the work is to be finished, reduced 50 per cent with turpentine, or a coat of Natural "Sunshine" reduced 50 per cent with turpentine. For hard, open-grained wood, the surface must first be filled with a natural shade of paste filler and when thoroughly dry treated in the same manner as close-grained wood.

For soft pine or similar grained soft wood, the surface should be filled in the same manner as hard, close-grained wood, but the reduction should be at the rate of 25 per cent turpentine. "Sunshine" reduced and applied in this manner will give even, uniform wear, strike well into the wood, stop absorption and leave an elastic surface to which the finishing coat can successfully bind.

Either of the fillers recommended by us will dry and be ready for sandpapering in 12 hours. When dry, thoroughly sandpaper to an even surface, being careful not to leave an excess of filler on any part of the work.

White shellac can be used on any of the classes of lumber named if judgment is exercised in reducing and sandpapering. A heavy coat of shellac should not be used for undercoats on floors, as it leaves too brittle a foundation for an elastic finish. If shellac is used, reduce to a very thin consistency. When dry, the floor must be thoroughly sandpapered to remove all excess of shellac from the surface.

On new work, to produce the effect shown on the sample shade card, fill the surface with "Sunshine" of the shade with which the work is to be finished, reduced 50 per cent with turpentine. Apply one coat of "Sunshine" and finish with one coat of Natural "Sunshine." If the Natural "Sun-

Directions for Using SUNSHINE Finishes—Continued.
 shine" is used as a filler, reduce 50 per cent with turpentine and apply two coats of "Sunshine" of the shade desired. The latter will give a slightly deeper and fuller effect than shown on the sample shade card. For a lighter effect than is shown on the sample shade card, apply over the Natural "Sunshine" filler one coat of "Sunshine" of the shade desired and finish with one coat of Natural "Sunshine." For a deeper effect than is shown on the sample shade card, fill the surface with "Sunshine" of the shade with which the work is to be finished, reduced 50 per cent with turpentine, and apply two coats of "Sunshine" of the shade desired.

On old work which has been finished of a similar shade to the finish desired, apply one coat of "Sunshine" and finish with a coat of Natural "Sunshine." To produce the effect shown on the sample shade card when used over a suitable ground color, apply two coats of "Sunshine." For a natural finish on hard, close-grained woods, reduce the Natural "Sunshine" 50 per cent with turpentine. When hard dry, sandpaper thoroughly and apply a coat of Natural "Sunshine" reduced 15 per cent with turpentine, and finish with Natural "Sunshine" as received in the package.

Never apply less than two coats on a floor with a properly filled surface. Shake the can thoroughly before opening and keep the mixture of a uniform consistency by frequent mixing. Keep the package tightly covered when not in use. Remember you are using a varnish color, and if thinning is necessary, use turpentine only. Do not try to change the shade by adding color in oil or Japan. A deeper or lighter effect can be obtained by the manner of application. Do not try to rush any kind of work on floors. Remember the floor is to be walked over and the finish should be thoroughly hard before the floor is used. After the finish has dried, mop the surface with clear cold water; this will assist in hardening.

Don't attempt to cover at one time too wide a strip or stretch on floors. Start at one corner of the room and take a strip or stretch from 20 to 24 inches wide, cutting it up to a joint in the floor so as not to have a lap at the edge of the stretch. Always finish with a back lick towards the starting point; this will avoid making laps. After thoroughly brushing "Sunshine," finish with a light stroke. Do not flow "Sunshine" on floors; brush out well and evenly.

Note information as to the protection and treatment of new floors, given on Pages 112-113 and 121.

Directions for Using SUNSHINE Finishes—Continued.

DIRECTIONS FOR NEW FLOORS.

See that the floor is perfectly clean and well sanded. Remove finger and heel marks with turpentine. Fill the surface according to the class of wood. When the floors are ready to finish, fill all cracks and crevices with Ajax Crack and Crevice Filler. Sandpaper thoroughly, being sure to remove any excess of Filler from the surface. Dust off carefully. Apply not less than two coats over this filled surface according to the depth of finish desired. Allow the undercoat to thoroughly harden, which, under good drying conditions, will require 24 hours. Sandpaper lightly or moss off and apply the finishing coat; to thoroughly harden, this should be allowed to stand from 24 to 48 hours, according to drying conditions. This will produce a full even gloss, and if desired can be rubbed to a flat finish.

On old floors which have been covered with carpet, dress the joints down smoothly and evenly, sandpaper thoroughly and proceed as with new work.

DIRECTIONS FOR OLD FLOORS WHICH HAVE BEEN VARNISHED OR STAINED.

"Sunshine" is transparent and will not give its true effect over a dark surface. Any of the shades shown may be used over light wood with natural finish or to refinish wood of corresponding color.

Floors that have been varnished or stained should first be washed with warm water and washing soda or powder, then rinsed off with clear warm water and thoroughly dried with a cloth. Do not use scouring soaps, as they contain pumice stone, silica or like gritty substances that will get into cracks or rough places and work out through the finish when brushing, causing the work to be gritty, also killing the luster. When dry, sandpaper and wipe off with a cloth that has been dampened with turpentine. This will remove the dust, also any grease that may be left on the floor.

If an oil polish has been used on the floor, thoroughly clean with water; then the floor should be thoroughly washed with turpentine to remove all of the oil or grease.

If the floor has been previously waxed, the wax must be removed by thoroughly cleaning with steel wool and turpentine or wood alcohol.

When the surface is thoroughly dry, if there are worn

Directions for Using SUNSHINE Finishes—Continued.
places, exposing the bare wood, touch up with "Sunshine," reduced as a filler. This will even up the surface and make uniform work. The touching up should be done according to the previous finish. If the previous finish is natural, touch up with Natural "Sunshine." If the surface was previously stained with a similar color, touch up with "Sunshine" of the color with which the floor is to be finished. When the touched-up spots are thoroughly dry, fill all cracks and crevices with Ajax Crack and Crevice Filler, sandpaper the whole surface and apply one or more coats according to the previous finish. If the floor was previously finished natural, two coats of "Sunshine" should be applied in order to bring out the full color. If previously stained and is in good condition, apply one coat of "Sunshine"; this can be finished with the coat of Natural "Sunshine" if desired.

OLD PAINTED FLOOR.

Where floors have been painted, wash with warm water and washing soda or powder, then rinse with clear warm water. When dry, fill the crack and crevices with Ajax Crack and Crevice Filler, sandpaper and apply one or more coats of Sunshine Ground Color, according to the condition of the work, see page 155. It should be borne in mind that for good work a clear ground color is necessary, and over-dark colored paint or old worn floors one coat is not sufficient. Allow ample time for the Sunshine Ground Color to harden through. Sandpaper between coats, also before applying the Finish. Apply two coats of "Sunshine" over Sunshine Ground Color.

More time is usually necessary for "Sunshine" to harden over paint than over bare or filled wood.

CHAIRS, FURNITURE, ETC.

Wash thoroughly with warm water and washing soda or powder, then rinse with clear water and dry with a cloth. If there is a possibility of grease, rub thoroughly with a cloth dampened in turpentine.

If furniture polish has been used on the work, be careful that this is thoroughly removed before applying "Sunshine." Sandpaper with No. 1/2 or No. 0 sandpaper and dust off, then touch up spots or worn places that expose the bare wood. When dry, sandpaper lightly and apply a coat of "Sunshine" over the entire surface.

Directions for Using SUNSHINE Finishes—Continued.

TABLE TOPS AND LIKE SURFACES.

The only satisfactory way to finish table tops that have received hard usage and the finish of which has turned white or spotted from hot dishes, is to remove all of the old finish with Wizard Paint and Varnish Remover. If hard wood, allow the remover to go only as far as the filler. If a stained top, remove all of the old stain, wash thoroughly with benzine or turpentine and wipe dry. Sandpaper smooth with No. 1 sandpaper and apply a coat of "Sunshine" reduced 50 per cent with turpentine. When dry, sandpaper lightly and apply a coat of "Sunshine" as received. When this is thoroughly dry, sandpaper or rub with curled hair and flow on a smooth even coat of Natural "Sunshine." This can be left in the gloss finish or rubbed and polished. "Sunshine" Finishes are put up in 1/4 pt., 1/2 pt., pt. and quart friction top cans, and 1/2 gal. and gal. square cork top cans, and larger packages when so ordered.

SUNSHINE GROUND COLOR.

Prepared to meet all the requirements of an undercoat for Sunshine Finishes which are to be applied over a dark painted, stained or worn surface.

It dries hard and produces a smooth flat surface of a uniform light color suitable as an undercoat for any shade of Sunshine Finishes. A ground color must be clear in order to produce a satisfactory effect with a stain. Over a dark painted or badly worn surface, two coats of Ground Color should be applied. Where two coats are used, the first coat should be reduced at the rate of one pint turpentine to the gallon of Sunshine Ground Color. When hard dry, apply a second coat of the Sunshine Ground Color as found in the package. If but one coat is to be applied, use as found in the package. See that the surface is dry, free from dirt and grease. Grease and oil stains should be removed with turpentine. Shake the can thoroughly before opening. Remove the full cover and mix contents thoroughly. If thinning should be necessary, use turpentine only.

Never add linseed oil to Sunshine Ground Color.

Put up in quarter-pint, half-pint, pint and quart friction-top cans, and half-gallon, and gallon round sealed-top packages, and larger packages when so ordered.

THE HEATH & MILLIGAN AJAX CRACK AND CREVICE FILLER

Ajax Crack and Crevice Filler is an improvement over the average crack and crevice fillers on the market and is in every sense of the word a perfect article for this class of work. It is a non-shrinkable, tough, elastic and adhesive compound for filling cracks, caused by shrinking of flooring, holes in boards, counters, desks, etc., and is also the most satisfactory article for filling cracks in decks and seams of all water craft. It can be easily applied and is thoroughly practical.

Ajax Crack and Crevice Filler is made in a color which closely matches any ordinary surface; when necessary to match a particular shade, it can be colored by the addition of a little dry color.

Ajax Crack and Crevice Filler dries quickly and sufficiently hard. It never dries brittle, thus cracking, but remains elastic.

Ajax Crack and Crevice Filler is put up in 1, 2, 5 and 10 pound cans; larger packages when so ordered.

DIRECTIONS FOR USING THE HEATH & MILLIGAN AJAX CRACK AND CREVICE FILLER

The surface to be filled must be clean and dry.

Remove all dirt from the cracks, and crevices with a stick cut from hard wood, shaped to fit the opening, or with any tool which will best serve the purpose.

Should there be any loose boards, they must be securely nailed or fastened down to insure a level surface on which to work.

Remove the friction-top cover of the package with a coin or nail; then take out a portion of the filler and work it up with the hands, the same as you would putty. This will make it of a consistency which will allow of its being easily put into the cracks and crevices.

Put the filler directly into the cracks and crevices with the hand, or knife well in, bearing down with some force to insure its going clear to the bottom of the opening. After the cracks have been thoroughly filled, rub the hands over the surface, removing all surplus filler and producing evenness. Gather up all of the surplus filler on the surface by bringing it in contact with the filler that remains in the

Directions for Using The Heath & Milligan Ajax Crack and Crevice Filler. Continued.

hand. In this way no filler is wasted and the floor is kept clean.

If a surface is rough and slivered, besides being cracked, it will be necessary to go over the entire work with the filler, after which the surface should be rubbed with burlap or rough cloths in order to remove all surplus filler and produce an even ground.

Do not attempt to varnish or finish a surface in any manner after the filler has been applied until it has had ample time to dry.

If the wood to be filled is dark, the filler can be tinted to suit the case by the addition of dry coloring matter.

Should Ajax Crack and Crevice Filler require moistening, add a very small quantity of turpentine.

When not using the filler, always keep the can closed by placing the friction-top cover back into place.

THE HEATH & MILLIGAN STOCK WHITE.

This is a heavy boiled prepared paint intended for practical painters' use. Every well-regulated paint shop has at all times in the mixing keg lead, zinc or other pigments mixed to a semi-paste consistency with oil. This is for convenience in tinting or to be reduced with either oil or turpentine.

In our Stock White we have a product which is of the right consistency for tinting, also can be reduced with either oil or turpentine to produce a gloss or flat finish as desired. It has an advantage over a hand-mixed product in being more thoroughly incorporated, containing the correct amount of the right kind of Japan; in being of the same consistency at all times and being put up in convenient sized packages.

A few advantages of Stock White are:

It is always ready for use; saves time of mixing; can be used for inside or outside work; is always reliable; is made of the proper materials to hide the surface; works right, and can be brushed out.

Stock White is put up in agitator barrels, half-barrels, five-gallon buckets and one-gallon cans.

TRE HEATH & MILLIGAN BEST PATENT DRYER.

A paste dryer especially adapted for use in white and light tints. It is practically colorless and will not stain white paint like the ordinary Manganese Japans.

One pound of Best Patent Dryer reduced according to directions is equal to one pint of the best turpentine Japan when used in white or light tints.

DIRECTIONS FOR REDUCING:

1 pound Best Patent Dryer, reduced with
1 pint Turpentine.

In breaking up Best Patent Dryer, supply a mixing cup large enough to hold the required amount of Dryer. The full amount should be put into a mixing cup and thoroughly beaten; then add a small amount of turpentine and beat this into the Best Patent Dryer, again adding a small amount of turpentine, and repeat the operation. When mixed to a paste consistency, the balance of turpentine may be gradually added until all is in the mixture. Best Patent Dryer mixed in this way will not be lumpy nor necessitate straining.

Where we give directions to use a given amount of Best Patent Dryer in reducing The Heath & Milligan Products, the amount of turpentine used in reducing the Best Patent Dryer must be deducted from the amount of turpentine recommended for the reduction of the paint.

Never add linseed oil to Best Patent Dryer.

Never add benzine to Best Patent Dryer.

Turpentine is the only reducer which should be used. Best Patent Dryer is put up in 1, 2, 3, 5, 10 and 25 pound cans and 100 pound kegs.

THE HEATH & MILLIGAN RAILWAY WHITE LEAD. (Trade-Mark.)

Railway White Lead is superior in every respect and for every purpose to any other brand of white lead; especially is its superiority prominent in the perfect surface it leaves for repainting, one of the most important requirements of a paint.

Railway White Lead covers more surface than strictly pure carbonate of lead and exceeds it in durability at least 50 per cent, besides producing a finer and more beautiful finish. It takes a larger percentage of oil than carbonate of lead, which fact makes a considerable saving in expense.

Railway White Lead will give perfect satisfaction, provided it is properly applied over a surface in condition to receive paint and is thinned according to directions.

No definite rule can be given for the exact amount required, as all depends upon the surface to be painted. Three and one-half pounds of Railway White Lead, reduced according to directions under normal conditions, will cover one square (100 square feet) two coats.

Railway White Lead is put up in 250 and 500 lb. casks; 12½, 25, 50 and 100 lb. kegs, and in 12½ and 25 lb. tins when so ordered, also in 1 to 5 lb. cans.

DIRECTIONS FOR USING THE HEATH & MILLIGAN RAILWAY WHITE LEAD.

(Note general directions, pages 131 to 134, inclusive.)
DO NOT APPLY THE PAINT TOO HEAVILY. Use plenty of "elbow grease." The paint must be thoroughly rubbed in or brushed out. DO NOT USE A CHEAP PRIMER. More jobs are spoiled by the use of a cheap primer than in any other way.

Allow plenty of time for drying. Paint may be surface dry and be by no means dry through. Sufficient time must be allowed for each coat to thoroughly harden through before the next coat is applied.

DIRECTIONS FOR REDUCING THE HEATH & MILLIGAN RAILWAY WHITE LEAD.

For the amount of paint required for a given surface, note information given above.

Prepare the surface and paint in accordance with general

Directions for Reducing The Heath & Milligan Railway White Lead—Continued.

eral directions, pages 131 to 134, inclusive.

It is impossible to give a general rule applying to all surfaces. If the surface is old or weather-beaten, more oil must be used than if it is new, hard or non-absorbent.

The following directions are for surfaces in normal conditions, viz.: Lumber of the average run in quality, grain, sap and dryness.

Always use raw linseed oil and turpentine for priming and second or middle coats.

Never use boiled linseed oil unless it may be for finishing coat.

The following amount of reducer is figured for white and light shades. Where darker shades are made, a proportionate amount of thinner must be added according to the color.

TWO-COAT NEW WORK

PRIMER.

For Hard Pine, Cypress, Hemlock, Oregon Pine, Ash, Chestnut and Oak, reduce as follows:

100 pounds Railway White Lead.

5 gallons Raw Linseed Oil.

1½ gallons Turpentine.

¾ gallon Turpentine Japan.

For White Pine, Poplar, Gum, Spruce, Birch, Elm and

Maple:

100 pounds Railway White Lead.

5¼ gallons Raw Linseed Oil.

¾ gallon Turpentine.

¼ gallon Turpentine Japan.

For Cottonwood, Basswood and Oregon Fir:

100 pounds Railway White Lead.

6 gallons Raw Linseed Oil.

1½ gallon Turpentine.

¼ gallon Turpentine Japan.

For Cedars and Redwood:

100 pounds Railway White Lead.

6½ gallons Raw Linseed Oil.

½ gallon Turpentine.

¾ gallon Turpentine Japan.

Allow 14 to 18 days, according to weather conditions, for the priming coat to thoroughly dry.

Putty all nail holes and cracks between priming and finishing coats.

Directions for Reducing The Heath & Mulligan Railway White Lead—Continued.

The finishing coat reduce as follows:

- 100 pounds Railway White Lead.
- 4½ gallons Raw Linseed Oil.
- ¼ gallon Turpentine Japan.

THREE COAT—NEW WORK.

PRIMER.

For Hard Pine, Cypress, Hemlock, Oregon Pine, Ash, Chestnut and Oak, reduce as follows:

- 100 pounds Railway White Lead.
- 5½ gallons Raw Linseed Oil.
- 1½ gallons Turpentine.
- ¼ gallon Turpentine Japan.

For White Pine, Poplar, Gum, Spruce, Birch, Elm and Maple:

- 100 pounds Railway White Lead.
- 6 gallons Raw Linseed Oil.
- ¾ gallon Turpentine.
- ¼ gallon Turpentine Japan.

For Cottonwood, Basswood and Oregon Fir:

- 100 pounds Railway White Lead.
- 6½ gallons Raw Linseed Oil.
- ½ gallon Turpentine.
- ¼ gallon Turpentine Japan.

For Cedars and Redwood:

- 100 pounds Railway White Lead.
- 7 gallons Raw Linseed Oil.
- ½ gallon Turpentine.
- ¼ gallon Turpentine Japan.

Allow 14 to 18 days, according to weather conditions, for the priming coat to dry.

Putty all nail holes and cracks between primer and second coat.

For second or first coat over primer reduce

- 100 pounds Railway White Lead.
- 4½ gallons Raw Linseed Oil.
- ¾ gallon Turpentine.
- ¼ gallon Turpentine Japan.

Allow 6 to 10 days, according to weather conditions, for the middle coat to thoroughly dry. Reputty if necessary after this coat.

Finishing coat reduce as follows:

- 100 pounds Railway White Lead.
- 5½ gallons Raw Linseed Oil.
- ¼ gallon Turpentine Japan.

Directions for Reducing The Heath & Mulligan Railway White Lead—Continued.

FOR PAINTING OLD WORK.

No definite rule covering reductions can be given, the amount of oil necessary depending upon the condition of the surface to be painted. Old or weather-beaten surfaces require more oil than hard or non-absorbent surfaces.

DIRECTIONS FOR TWO-COAT WORK UNDER NORMAL CONDITIONS.

FIRST COAT.

Reduce as follows:

- 100 pounds Railway White Lead.
- 4½ gallons Raw Linseed Oil.
- ¾ gallon Turpentine.
- ¼ gallon Turpentine Japan.

Allow six to ten days to dry, according to weather conditions. Putty all nail holes and cracks between primer and second coat.

SECOND OR FINISHING COAT.

Reduce as follows:

- 100 pounds Railway White Lead.
- 5½ gallons Raw Linseed Oil.
- ¾ gallon Turpentine Japan.

DIRECTIONS FOR INSIDE FINISHING.

(Where Best Patent Dryer is recommended, use in accordance with directions on page 159.)

FOR HALF FLAT FINISH.

Reduce as follows for both primer and finishing coats:

- 100 pounds Railway White Lead.
- 2¼ gallons Turpentine.
- 1 gallon Raw Linseed Oil.
- 1 pound Best Patent Dryer.

FOR EGGSHELL GLOSS:

Prime as noted before for Half Flat Finish, reducing the

finishing coat as follows:

- 100 pounds Railway White Lead.
- 2¼ gallons Turpentine.
- ½ gallon Raw Linseed Oil.
- 1 pound Best Patent Dryer.

FOR FLAT FINISH:

Three coats are necessary, reduced as follows:

PRIMER:

- 100 pounds Railway White Lead.

Directions for Reducing The Heath & Milligan Railway White Lead—Continued.

2½ gallons Turpentine.
¼ gallon Raw Linseed Oil.
1 pound Best Patent Dryer.

SECOND COAT OR FIRST COAT OVER PRIMER:

100 pounds Railway White Lead.
2½ gallons Turpentine.
1 pound Best Patent Dryer.
1-16 to ¼ gallon White or Enamel Varnish.

FINISHING COAT:

100 pounds Railway White Lead.
2½ to 2¾ gallons Turpentine.
1 pound Best Patent Dryer.
1-16 to ¼ gallon White or Enamel Varnish.

FOR A DEAD FLAT FINISH:

Prime and second coat as for flat finish, and reduce the finishing coat as follows:

100 pounds Railway White Lead mixed to a semi-paste consistency with one gallon Turpentine.

Pour over the top of the mixture ¼ gallon Turpentine and allow it to stand over night; the next morning pour off the accumulated thinners from the top of the paint, then add 2 gallons Turpentine.

½ pound Best Patent Dryer.

1-16 to ¼ gallon White or Enamel Varnish.

This will keep the paint from flying or spattering and will produce a dead flat finish.

THE HEATH & MILLIGAN BEST COLORS IN OIL, DOUBLY GROUND IN PURE LINSEED OIL.

Each individual color is ground according to its nature, regardless of being doubly ground to insure full strength of color.

In all respects The Heath & Milligan Best Colors in Oil are the best on the market. That they are satisfactory is shown by the fact that they are used by expert painters in practically every city and town in the United States.

Colors in Oil are primarily house painters' tinting colors. In connection with the white base used they form for him a practically unlimited line of colors which will bring out any artistic or decorative design he may have in view.

Every color used for this purpose has a distinct field of usefulness all its own. In bringing out the best results there is required the high degree of artistic excellence which distinguishes the expert painter.

It is always best to use one color alone, if possible, for the purpose of bringing about the desired result; as much expertness is needed in the proper use of one color as in a combination of colors in bringing about the desired result. It is also necessary for the expert workman not only to make a critical examination of each of the colors he will need in the work, but also to learn the composition of each as far as possible and thus save many a failure.

Yellow, red and blue are primary colors. In combination with white they will theoretically make every shade. It is necessary, however, to use black and white frequently, and practically it is not possible to produce every shade artificially with the use of the three colors noted in connection with black and white. Nature has made good this deficiency, however, by a number of natural earth pigments which must be constantly used in matching tints. It is possible to produce the tint of practically any of these earth pigments by combinations of yellow, red, blue, white and black, but such tints, made from a combination of colors, will not have the same soft, true tone that the natural earth pigment properly used will produce.

It is a mistake to figure that the test of Colors in Oil lies wholly in their strength. This, of course, is perhaps the leading point in excellence, as it involves an economical use of paint pigments by the painter. It very frequently happens, however, that it is of more importance to produce a clear characteristic color and one which will retain the

The Heath & Milligan Best Colors in Oil, Doubly Ground in Pure Linseed Oil.—Continued.

same tone from the deepest to the lightest tint.

This point is of special importance to the grainer and stainer. In addition to strength and tone the richness and fullness of the body must be considered and also the transparency and depth of undertone.

It is impossible here to put down hard and fast rules for the use of Colors in Oil. Our booklet, "A Treatise on Best Colors in Oil, Supplemented by Color Chart," gives a short treatise on each color and is gladly furnished on request to practical painters only.

The design of this treatise on Colors in Oil is to aid out friends in a threefold direction.

FIRST: By giving a brief outline of the composition, source and method of manufacture of the more important of these colors.

SECOND: To make a selection of the most useful colors or shades of each class with especial reference to strength, durability and practical utility. These colors have been considered both singly and as a complete line, each supplementing the other and yet having a definite place which nothing else can supply as well.

THIRD: To indicate, both by a carefully arranged color chart and by direction, the more common uses to which each of the different colors can be best put, leaving of course to the skill and experience of the trained painter and decorator the selection of those colors best suited to the work in hand.

THE HEATH & MILLIGAN CRYLIGHT GREEN.

Crylight Green has been a standard color for over thirty years. On account of its brilliancy, permanency and covering properties, it is the foremost of window blind greens.

Crylight Green is made in three shades, Light, Medium and Dark, and is put up in 1, 2, 3, 5, 10 and 25 pound cans.

Greens are not fillers and should never be used on bare wood, but should always be used over a suitable priming coat.

Where one coat of Green is to be used over a primer, the primer should be tinted to a greenish cast to insure proper covering.

Olive Best Prepared Paint makes a suitable primer for either Crylight Green in Oil or Crylight Green Best Prepared Paint.

If Olive Best Prepared Paint is used as a primer, it should be reduced for either two or three coat work according to the lumber over which it is to be applied, following directions on page 140.

If two-coat work, apply Crylight Green in Oil reduced as follows:

10 pounds Crylight Green in Oil.

7-16 gallon Raw Linseed Oil.

1-32 gallon Turpentine.

1-32 gallon Turpentine Japan.

If three-coat work and two coats of Green are to be applied, the middle coat should be further reduced with turpentine.

If Crylight Green Best Prepared Paint is used, prime with Olive Best Prepared Paint reduced according to directions.

If one coat of Green is to be used over a primer, apply Crylight Green Best Prepared Paint as received in the package, after thoroughly mixing.

If three-coat work, reduce the primer according to directions for three-coat work and apply the second or middle coat of Crylight Green Best Prepared Paint reduced at the rate of $\frac{1}{8}$ gallon turpentine to one gallon of paint. Apply the finishing coat as received in the package.

It is always safe to figure one pound of Best Crylight Green in Oil to paint one pair of average sized blinds one coat.

THE HEATH & MILLIGAN PERMA RED.

This product is a realization of the color-maker's aim, viz.: to produce a permanent, rich-bodied lake within the means of the average consumer.

Vastly superior in permanency and lasting brilliancy to the ordinary reds or vermilions.

Intended for painting store fronts, advertising signs, front doors, sashes, lawn seats, chairs, etc.

Best Perma Red should be reduced to a heavy consistency, applied in the same manner as any oil color and well brushed out.

To produce the best results as to permanency and brilliancy two coats are recommended—the undercoat mixed half flat.

If a new surface, the priming coat should be of red or dark terra cotta. If one coat only is used, the effect depends upon the undercoating.

The color will show lighter if applied over terra cotta, while darker if applied over a deep red.

Do not apply Best Perma Red over a white or light colored ground.

While classed as a permanent color in the solid, Best Perma Red in Oil should never be used in combination with white to produce tints, as in such a combination it loses its permanency.

Perma Red in Japan should be handled in the same manner as any other Japan color. It dries quickly, flats perfectly and possesses the necessary binding properties. It should be thinned with turpentine only and applied over a suitable flat ground color.

Perma Red, dry, is especially adapted to fresco work, either as a solid color or in making calcimine or fresco tints.

Best Perma Red in Oil is put up in 1, 2, 5, 10 and 25 pound cans and 100 pound kegs.

Perma Red in Japan is put up in 1, 2, 5 and 10 pound cans; also 5 and 10 pound patent press cans.

Perma Red is sold dry in 6 pound cans; 100 pound kegs; also bulk lots in any quantity.

THE HEATH & MILLIGAN IXL ROOF AND BARN PAINT. IN LIQUID FORM.

The Heath & Milligan IXL Roof and Barn Paint is made especially for use on barns, roofs, fences, bridges, cars, grain elevators, factories and large structures of all kinds on which a first-class mineral paint should be used.

The Heath & Milligan IXL Roof and Barn Paint is a combination of pure mineral colors, linseed oil and the necessary dryers. It is a paint, not a stain. It does not contain resin, coal tar nor other ingredients which are sometimes used to cheapen paint. It is a strictly high-grade paint, made with special consideration of durability, appearance and preserving qualities. The same care and process are used in its manufacture as in making The Heath & Milligan Best Prepared Paint.

Hand-mixed dry mineral and linseed oil will not make a lasting, protecting paint. Power is absolutely necessary to combine the pigments and the oil; this we accomplish by machinery with a crushing weight of 2,200 pounds to the square inch and extra fine grinding through special mills, thus thoroughly driving the oil into the pigment. Where dry pigments and oil are mixed by hand or with light machinery, only the outside particles of the pigment are coated with oil. When such paint is applied to a surface, the absorption on one side and the atmospheric action on the other soon draw the oil away from the pigment or destroy it. This leaves the dry pigment on the surface without a binder and it is easily washed off.

For painting roofs, either tin or shingle, IXL Roof and Barn Paint more than pays for itself as a preventive of decay and leaks. Shingles can not warp when covered with it and their life is more than tripled if dipped in the paint before being laid.

The Heath & Milligan IXL Roof and Barn Paint is made in seven suitable shades, shown on the sample shade card. It is put up in barrels, half barrels, five-gallon buckets and one-gallon cans.

DIRECTIONS FOR USING THE HEATH & MILLIGAN IXL ROOF AND BARN PAINT IN LIQUID FORM.

(Carefully note General Directions, Pages 131 to 134, inclusive.)

In all cases prepare the surface and the paint in accordance with directions.

Directions for Using The Heath & Milligan IXL Roof and Barn Paint in Liquid Form—Continued.

For the amount of IXL necessary for a given surface, see Page 129.

BARNs, WOODEN BRIDGES, FENCES, ETC.

Reduce IXL for the priming coat with 25 per cent pure raw linseed oil. Allow plenty of time for this coat to dry and for second coat use IXL as found in the package.

No definite rule can be given as to the amount of paint required, all depending upon the condition of the surface to be painted. For old or weather-beaten wood more oil is required than for non-absorbent woods.

SHINGLE ROOFS.

Never paint damp shingles. To get the best results they must be perfectly dry. Work the paint well into the cracks.

NEW SHINGLES.

The first coat should be reduced with 25 per cent pure raw linseed oil. Allow plenty of time for this coat to harden through. For second coat use IXL as found in the package.

FOR OLD OR WEATHER-BEATEN SHINGLES.

No definite figures can be given for the amount of paint required. Old shingles will absorb more oil than new ones; the cracks are much more numerous.

For old shingles, reduce the first coat with at least 50 per cent pure raw linseed oil. Allow this coat to harden through. For the second coat use IXL as found in the package.

FOR DIPPING SHINGLES.

After thoroughly mixing, reduce 1 gallon IXL with 1 gallon pure raw linseed oil.

Shingles should be dipped at least 11 inches. This gives 4½ inches to the weather and 6½ inches for the underlap.

Two gallons of IXL, used in accordance with directions, will coat 1,000 regulation sized shingles, dipped at least 11 inches.

When the shingles are laid, finish with one coat of IXL as found in the package.

FOR TIN ROOFS, SPOUTS AND METALLIC SURFACES.

(Note information given under the heading of "Painting Galvanized Iron, Pages 108 and 109.)

For all first coats on tin, iron or other metal, reduce IXL

PRACTICAL PAINTING.

Directions for Using The Heath & Milligan IXL Roof and Barn Paint in Liquid Form—Continued.

with turpentine at the rate of ¼ gallon turpentine to 1 gallon of IXL. Do not apply a heavy first coat, but a thin one, better, provided it covers the surface.

After letting the first coat dry hard, apply a second coat of IXL as found in the package.

FOR BRICK AND STONE WALLS.

After cleaning the surface, apply a primer coat reduced with 25 to 50 per cent pure raw linseed oil, according to the porosity of the surface. Old brick will absorb more oil than new. Apply a final coat of IXL as found in the package.

IN GENERAL.

Never use a cheap primer. Use IXL as noted. More jobs are spoiled by cheap primers than in any other way.

NEVER USE BOILED LINSEED OIL IN IXL.

NEVER ADD JAPAN TO IXL—it will prevent drying. Add amount of oxidizer to insure proper drying.

THE HEATH & MILLIGAN MOSS GREEN ROOF PAINT.

This is a strictly high-grade paint, embodying the maximum of durability, richness and preserving qualities. Does not fade.

Preserves the shingles and makes them absolutely weatherproof.

More than pays for itself as a preventive of leaky roofs. Shingles can not warp when covered with it.

It is a paint, not a stain.

Use in accordance with directions and information given under the heading "IXL Roof and Barn Paint," Pages 169 to 171, inclusive.

Moss Green Roof Paint is of the same quality as our Best Prepared Paint and while especially designed for roofs it can be used on any exterior work.

Put up in barrels, 50 gallons; half-barrels, 25 gallons; five-gallon buckets and one-gallon cans.

THE HEATH & MILLIGAN DURABLE FLAT BRICK RED IN PASTE FORM.

Makes a perfect imitation of pressed brick on any brick wall when thinned with turpentine and applied over a suitable undercoating. It dries perfectly flat in from two to three hours when thinned according to directions. Rain will not injure the Flat Brick Red surface after it has dried.

UNDERCOATINGS OF OIL PAINT MUST BE USED.

We recommend as the best undercoatings H. & M. IXL Venetian Red Roof and Barn Paint or H. & M. Best Venetian Red in Oil, reduced with pure raw linseed oil and turpentine.

Never use a dry color mixed by hand for an undercoat, and especially NEVER USE A CHEAP PRIMER.

The durability of Flat Brick Red depends on the undercoatings.

If the brick surface is porous, more oil must be used in the priming coat. Old bricks are much more porous and absorb more oil than when new. Remember this point especially: use more oil in the priming coat if the brick surface is porous.

The Heath & Milligan Durable Flat Brick Red is put up in 100 pound kegs; 10 and 25 pound cans.

The directions for priming are for ordinary surfaces.

DIRECTIONS FOR USING THE HEATH & MILLIGAN DURABLE FLAT BRICK RED.

The surface must be dry and free from moisture. Allow all undercoatings to become perfectly dry and harden through before subsequent coats are applied.

UNDERCOATINGS.

For ordinary surfaces, where IXL Venetian Red Roof and Barn Paint is used for the undercoatings, note general directions, Pages 131 to 134, inclusive.

Prepare the surface and paint in accordance with directions. Reduce as follows:

1 gallon IXL Roof and Barn Paint.
1½ pints Raw Linseed Oil.
1½ pints Turpentine.

To ascertain the amount of IXL required for a given surface when used for undercoatings, figure one gallon, reduced according to directions, to cover 200 to 400 square feet.

Directions for Using The Heath & Milligan Durable Flat Brick Red
Continued.

according to the porosity of the surface.

For the second coat use 1X1 as found in the package.

If H. & M. BEST VENETIAN RED IN OIL is used for the undercoating, reduce as follows for the first coat:

100 pounds H. & M. Best Venetian Red in Oil.

5½ gallons Raw Linseed Oil.

½ gallon Turpentine.

¼ gallon Turpentine Japan.

For the second coat reduce H. & M. Best Venetian Red in Oil as follows:

100 pounds H. & M. Best Venetian Red in Oil.

5 gallons Raw Linseed Oil.

½ gallon Turpentine.

¼ gallon Turpentine Japan.

To ascertain the amount of Best Venetian Red in Oil required for a given surface when used for undercoatings, figure 2¾ to 3½ pounds, reduced according to directions, to cover 100 square feet, two coats.

Allow five to eight days, according to weather conditions, for each undercoating to harden through.

FINISHING COAT.

Two pounds Durable Flat Brick Red, reduced according to directions and applied over a suitable undercoating, will cover a square.

In mixing, add a small amount of turpentine to Durable Flat Brick Red and beat this up to a smooth paste. Then gradually add more turpentine and continue mixing in accordance with the following until the full amount of the reducer is added. If mixed in this way the paint will not be lumpy.

For the finishing coat, reduce H. & M. Durable Flat Brick Red in the following proportions:

100 pounds H. & M. Durable Flat Brick Red.

5 gallons Turpentine.

In mixing the flat color, do not mix more than will be used in one day.

Keep the mixing keg tightly covered and out of the sun.

All the work must be gone over at one time, as Flat Brick Red dries very quickly and cannot be touched up without showing spots.

At the end of a stretch cut around the brick on the mortar joints; also follow the joint at the bottom of the stretch. Cut in and do not lap over on the finished part, as

Directions for Using The Heath & Milligan Durable Flat Brick Red
Continued.

this will show and dry with a gloss.

NEVER USE BOILED LINSEED OIL COATINGS.

NEVER REDUCE FLAT BRICK RED WITH PURE SPIRITS OF TURPENTINE IS THAT SHOULD BE ADDED.

Durable Flat Brick Red can be temporary with amount of raw linseed oil or japan if used.

THE HEATH & MILLIGAN BEST GRAPHITE PAINT IN LIQUID AND PASTE FORMS.

The Heath & Milligan Best Graphite Paint is made in the two forms noted in order to meet all requirements.

When reduced in accordance with directions, Best Graphite Paint in Paste Form is to be used in exactly the same way as Best Graphite Paint in Liquid Form.

Best Graphite Paint is especially adapted for painting iron structures, roofs, bridges or any similar surface requiring an extremely durable coating. It can be used on wood, but is especially recommended for metal.

High-grade graphite, such as is used in Best Graphite Paint, is unaffected by acids, alkalis or atmospheric gases. It makes a protecting coat of great durability and one which will withstand a maximum amount of heat. It is thus especially serviceable on smokestacks, boiler fronts or similar surfaces which come in contact with extreme heat.

Graphite is of a greasy nature and where two coats are used the undercoat must be partly flatted with turpentine, otherwise the paint will sag or run. Graphite can not be applied over a glossy surface with satisfactory results. It is naturally a slow dryer and plenty of time must be given for drying. It has great body and must be well rubbed out under the brush and not flowed on.

In order to make Graphite dry quickly, do not burn the color or destroy its elasticity with an excess of japan. Give it time to dry.

Best Graphite Paint is sold only in the natural shade which is deep slate color, as shown on the sample shade card.

To ascertain the amount of Best Graphite Paint in Paste Form required to paint a metallic surface, it is safe to figure that two pounds, reduced according to directions, will paint 100 square feet, one coat.

Best Graphite Paint in Paste Form is put up in barrels, half-barrels, 100 pound kegs, and in 12½ and 25 pound cans.

To ascertain the amount of Best Graphite Paint in Liquid Form required to paint a metallic surface, it is safe to figure that one gallon will cover 600 square feet, one coat.

Best Graphite Paint in Liquid Form is put up in barrels, half-barrels, five-gallon buckets and one-gallon cans.

DIRECTIONS FOR USING THE HEATH & MILLIGAN BEST GRAPHITE PAINT IN LIQUID FORM.

(Carefully note General Directions, Page 175, inclusive.)

In all cases prepare the surface and clean with directions.

(Note information given under the heading "Galvanized Iron," Pages 108 and 109.)

Note carefully the instructions relative to stains being removed with turpentine or kerosene, especially necessary on new metallic surfaces which become coated with grease, acids or rust from manufacture. One or two hard rains will remove these substances. They must be removed and exposed entirely of linseed oil and pigment. In general, use a small quantity in thinning the paint for such a surface.

The best results in painting tin or galvanized iron are obtained by first thoroughly cleaning the surface with a first coat of IXL Roof and Barn Paint, and then applying Best Graphite Paint, according to directions for tin and metallic surfaces, Pages 108 and 109.

Heavy coats of paint should never be applied to tin or galvanized iron; otherwise the paint is liable to peel.

Where one coat only is to be applied, Best Graphite Paint in Liquid Form should be used as found in the package after thoroughly mixing.

FOR TWO COAT WORK.

FIRST COAT:

Thin in the proportion of a quart of turpentine to a gallon of Best Graphite Paint.

FINISHING COAT:

Apply as found in the package, after thoroughly mixing.

DIRECTIONS FOR THINNING THE HEATH & MILLIGAN BEST GRAPHITE PAINT IN PASTE FORM.

PAINT IN PASTE FORM.

(Carefully note General Directions, Page 175, inclusive.)

In all cases prepare the surface and clean with directions.

Directions for Thinning The Heath & Milligan Best Graphite Paint in Paste Form—Continued.

Provide a mixing keg of the proper size to hold all the paint needed for each coat, allowing room for stirring.

Thoroughly break up and mix Best Graphite Paint in Paste Form with a broad, flat paddle, in accordance with following directions:

Keep the paint from skinning over by tightly covering the mixing keg when not in use. The best method is to use a piece of heavy canvas forced tightly over the head of the mixing keg with a hoop.

FOR TWO COAT WORK.

FIRST COAT:

Reduce in the following proportions:

100 pounds Best Graphite in Paste Form.
5½ gallons Pure Boiled Linseed Oil.
1 gallon Turpentine.

FINISHING COAT:

Reduce in the following proportions:

100 pounds Best Graphite in Paste Form.
6½ gallons Pure Boiled Linseed Oil.
¾ gallon Turpentine.

FOR ONE COAT WORK.

Use Best Graphite Paint in Paste Form, reduced in the following proportions:

100 pounds Best Graphite in Paste Form.
6½ gallons Pure Boiled Linseed Oil.
¾ gallon Turpentine.

The use of boiled linseed oil in reducing Best Graphite Paint in Paste Form is practically the only exception to the rule against its use.

THE HEATH & MILLIGAN OIL WOOD STAIN IN LIQUID FORM.

A combination stain and filler for close-grained wood. For use on bare wood or over a suitably prepared surface which has been painted, stained or varnished.

Note information given under the heading of "Staining" as to the preparation of the surface and application of the Stain, Pages 120 and 121.

Shake the can vigorously before opening. Remove the full head of the package and thoroughly stir the contents.

Oil Wood Stain is a pigment stain, and owing to the small amount of pigment used to produce the color, it is doubly important that all of it should be mixed in.

ON NEW WORK, if only one coat is to be applied, use as found in the package. If a deeper effect is desired, two coats can be applied, reducing the first coat 50 per cent with turpentine. This will strike into and fill the surface and give depth of color and brilliancy to the finishing coat of Stain. Sandpaper lightly and apply one or more coats of a finishing varnish.

ON OLD WORK, Oil Wood Stain being transparent will not produce its natural color over a dark surface. The various shades can be used over light woods with natural finish or to refinish woods of the same shade. Oil Wood Stain can also be used over a light painted surface, but a much better effect will be produced if used over a suitable ground color.

As a suitable ground color for any of the shades shown on sample shade card, we recommend H. & M. Ground Color, see Page 181.

A very natural effect can be produced on new or suitably prepared old work by first applying one coat of Oil Wood Stain and glazing with one coat of The Heath & Milligan Varnish Stain of a corresponding color. Sandpaper lightly between coats. This brings out the depth and richness of the color, leaving the finish with a luster which does not need varnishing.

The depth of color depends largely upon the manner of application. A coat of Oil Wood Stain flowed onto the surface will give a deeper effect than if brushed out.

Never use linseed oil in Oil Wood Stain. If thinning is necessary, use turpentine only. The addition of turpentine will lighten the shade.

Oil Wood Stain is put up in all sized packages from half pints to barrels.

THE HEATH & MILLIGAN VARNISH STAIN IN LIQUID FORM.

A quick-drying varnish color for imitating natural woods. Can be used either on bare wood or over a suitably prepared surface which has been painted, stained or varnished. It stains and varnishes in one operation.

The Heath & Milligan Varnish Stain is made from the best coach varnish and will wear without cracking or chipping.

Shake the package well before opening. Remove the full head of the package and stir contents with a flat paddle.

The Heath & Milligan Varnish Stain is a pigment color, and care should be taken to have all of the pigment thoroughly mixed in.

See that the surface is clean, free from dirt, grease or finger marks and well sandpapered.

On new work, better results will be obtained if the surface is first filled to stop absorption.

As a filler for hard, close-grained woods we recommend the Varnish Stain reduced 50 per cent with turpentine.

For white pine and similar soft, close-grained woods, reduce the Varnish Stain with 25 per cent turpentine. Sandpaper lightly, and when dry one coat of Varnish Stain applied over a surface filled as noted will bring out the full color as shown on the sample shade card. This coat will also act as a glaze, and a coat of varnish is not necessary.

One coat of Varnish Stain applied on new work will produce a lighter effect than is shown on the sample shade card. Where one coat is used, flow the Varnish Stain onto the surface. When dry, sandpaper lightly and apply one coat of finishing varnish.

Varnish Stain colors are transparent and will not give their true effect over a darker surface. Any of the shades shown may be used over light wood with natural finish or to refinish wood of a corresponding color. Varnish Stain may be used over a light painted surface, but a much better effect will be produced if used over a suitable ground or first coat color. As a suitable ground color for any of the shades shown on the Varnish Stain sample shade card, we recommend H. & M. Ground Color, see Page 181.

One coat of Varnish Stain applied over a suitable ground color or for refinishing wood of a corresponding color will produce a varnish finish.

The Heath & Milligan Varnish Stain in Liquid Form—Continued.

In refinishing chairs, tables or similar work, see that the surface is perfectly clean and free from furniture polish, oil or grease. It is always safer to go over work of this class with a cloth dampened in turpentine. If there are worn places, they should first be touched up with Varnish Stain to even the surface. When dry, sandpaper the surface lightly and flow on a smooth even coat of Varnish Stain.

Never use linseed oil in Varnish Stain. If thinning is necessary, use turpentine only.

Varnish Stain is put up in half-pint, pint and quart friction-top cans, and half-gallon, gallon round sealed-top packages and larger packages when so ordered.

H. & M. GROUND COLOR.

Prepared to meet all the requirements of an undercoat for stains or graining colors which are to be applied over a dark painted, varnished, stained or worn surface.

It dries hard and produces a smooth flat surface of a uniform light color suitable as an undercoat for any shade of The Heath & Milligan Varnish Stain. A ground color must be clear in order to produce a satisfactory effect with a stain. Over a dark painted or badly worn surface, two coats of Ground Color should be applied. Where two coats are used, the first coat should be reduced at the rate of one pint turpentine to a gallon of Ground Color. When hard dry, apply a second coat of the Ground Color as found in the package. If but one coat is to be applied, use as found in the package. See that the surface is dry, free from dirt and grease. Grease and oil stains should be removed with turpentine. Shake the can thoroughly before opening. Remove the entire cover and mix contents thoroughly. If thinning should be necessary, use turpentine only.

Never add linseed oil to H. & M. Ground Color.

Put up in half-pint, pint and quart friction-top cans, half-gallon and gallon round, sealed-top cans and larger packages when so ordered.

H. & M. LIQUID ENAMEL.

H. & M. Liquid Enamel is ground in varnish and especially prepared for all kinds of high-class interior decorating where a finish of high luster is wanted.

Ready for use; dries in from six to eight hours, and is put up in quarter-pint, half-pint, pint and quart friction-top cans; half-gallon and gallon round cans, and larger packages.

H. & M. Liquid Enamel is made in the attractive shades shown on the sample shade card; also in black and white.

DIRECTIONS FOR USING H. & M. LIQUID ENAMEL.

(Note information for new work, under the heading of "Enamel," Pages 117-118. For old work, under the heading of "Gloss Finish," Pages 124 and 125.)

The surface to be enameled must be clean, dry and free from grease, dust and dirt. Scrape off all loose paint. Grease and oil stains should be removed with turpentine or benzine.

Use a fine bristle or fitch hair varnish brush. Apply the enamel freely. Keep the brush full. Do not rub out the enamel, but flow it on smoothly and evenly. If the enamel is stiff or works hard, add a few drops of turpentine, but not enough to destroy the gloss. Where the surface to be enameled is of a dark color or on new work, one or more coats of paint of about the same shade as the enamel to be used should first be applied.

This paint must be reduced with turpentine to give a flat or partly flat finish.

See that the undercoats are dried through and perfectly hard before the enamel is applied. Paint may be dry on the surface but by no means dry through.

Where two coats of enamel are used, the undercoat must be reduced with turpentine in the proportion of one pint to a gallon of the enamel.

Finish with H. & M. Liquid Enamel as found in the package.

INSTRUCTIONS FOR INSIDE FINISHING.

With all classes of enamel work the following instructions as to applying the enamel should be observed:

Directions for Using H. & M. Liquid Enamel (Continued.)

DOORS.—Paint the casings first and then the panels, using care not to let the paint run or lap over the stiles, forming heavy edges.

WINDOWS.—Trace the sash first; afterward the casings. Avoid having too much paint between inside stops; otherwise it will keep the sash from working.

See that all undercoatings are dry and hard through before subsequent coats are applied. If these coats are only surface-dry the enamel is sure to crack.

NEVER USE LINSEED OIL IN ENAMEL. It is certain to make it remain tacky.

If in cold or chilly weather the enamel works too heavy and any thinning should be necessary, use a small amount of turpentine. Avoid using too much; otherwise it will destroy the luster.

Go over the surface quickly with a full brush, as the enamel dries very rapidly. Mix the enamel thoroughly and to a uniform consistency before starting to work.

TO ENAMEL IN COLORS ON NEW WORK.

Work of this description can be done at a cost slightly more than ordinary three coat painting. The method is as follows:

PRIMING COAT.

100 pounds Railway White Lead.

2½ gallons Turpentine.

¼ gallon Raw Linseed Oil.

¼ gallon Light Colored Turpentine Japan.

When this coat is hard dry, sandpaper lightly with No. 1 sandpaper. Apply a second coat of paint tinted to the shade of the enamel to be used, and reduce as follows:

100 pounds Railway White Lead.

2½ gallons Turpentine.

¼ gallon of the Enamel to be used.

¼ gallon Light Colored Turpentine Japan.

When this is hard dry, sandpaper lightly with No. ½ sandpaper. Do not sandpaper through on the edges.

For the finishing coat flow on a smooth, even coat of enamel as found in the package.

TO ENAMEL IN WHITE.

Pine and other soft woods should receive a coat of white shellac before painting. When dry, thoroughly sandpaper with No. 1 sandpaper.

Directions for Using H. & M. Liquid Enamel—Continued.

The Heath & Milligan Railway White Lead takes more reducer and is preferable to strictly pure white lead. Where Railway White Lead is used for undercoating it should be reduced as follows:

FIRST PAINT COAT.

100 pounds Railway White Lead.
2½ gallons Turpentine.
1 pound H. & M. Best Patent Dryer.
¼ gallon H. & M. White Liquid Enamel.

Where Best Patent Dryer is recommended, use in accordance with directions on Page 159.

Mixed in this way there is abundance of time in which to work the paint out before it sets. It will dry flat. When hard dry, sandpaper smoothly with No. ½ sandpaper. Dust off and give a coat of dead flat white reduced as follows:

100 pounds Railway White Lead washed with turpentine, according to instructions given on Page 164, under the heading of "Dead Flat Finish."

2 gallons Turpentine.
½ pound H. & M. Best Patent Dryer.
¼ gallon H. & M. White Liquid Enamel.

If three coats of flat color are to be used under Enamel Finish, apply two coats of the First Paint Coat Mixture and one coat of dead flat.

When this is hard through, sandpaper lightly and evenly with No. 0 sandpaper, taking care not to go through on the edges and sharp corners.

Apply a coat of H. & M. Liquid Enamel, reduced at the rate of a half-pint to a pint of turpentine to one gallon of enamel, according to weather conditions. More turpentine is necessary in cold or chilly weather than in hot or humid weather.

Allow at least 48 hours for this coat to dry. Sandpaper lightly with No. 00 sandpaper or rub thoroughly with curled hair to remove the gloss. Dust off thoroughly and flow on a smooth, even coat of enamel as found in the package. This will dry dust free in one hour, harden through in four days and leave a high gloss or china finish.

THE HEATH & MILLIGAN SATSUMA INTERIOR ENAMELS.

For years enamels have been considered too expensive for general purposes. The great demand for an enamel which could be sold at popular prices and still be of superior quality induced us to make our Satsuma Interior Enamels. They are not the result of a day's thought, but the product of years of experience and experimenting in this class of goods.

Satsuma Interior Enamels are for use on walls, wood-work and all classes of interior decorations.

To enamel a gloss surface or one which has been varnished, the gloss must be removed by thoroughly sandpapering with No. 1 sandpaper.

If the surface is light colored or about the shade of the enamel to be applied, one or two coats of enamel can be applied without undercoatings. For white or light tints, if the surface is of a dark color, after sandpapering to a smooth surface apply two coats of The Heath & Milligan Best Prepared Paint Inside White. Allow each coat to harden through, then lightly sandpaper with No. ½ sandpaper and apply one or two coats of enamel. In all cases allow each coat to dry thoroughly and sandpaper between coats.

To enamel a plastered wall which has been calcimined, the calcimine must first be washed off and the wall coated with two coats of Best Prepared Paint of about the shade of the Satsuma which is to be applied, reducing the Best Prepared Paint to an eggshell gloss; then finish with one or two coats of Satsuma.

Satsuma sets much quicker than oil paints and must be put on with a full brush.

NEVER ADD LANSSEED OIL TO SATSUMA INTERIOR ENAMELS. If any thinner is necessary, use turpentine only.

Be sure all undercoatings are hard dry before applying subsequent coats.

Remove all gloss from undercoatings, as a gloss coat can not be successfully applied over a gloss coat.

DIRECTIONS FOR USING THE HEATH & MILLIGAN SATSUMA INTERIOR ENAMELS.

(Carefully note General Directions, Pages 131 to 134, inclusive.)

In all cases prepare the surface and enamel in accordance with directions.

Apply the enamel freely. Keep the brush full. Do not

Directions for Using The Heath & Milligan Satsuma Interior Enamels—Continued.

rub out the enamel; flow it on smoothly and evenly. If the enamel is stiff or works hard, add a few drops of turpentine, but not enough to destroy the gloss.

The more explicit information given under the heading of "The H. & M. Liquid Enamel," Pages 182 to 184, inclusive, applies to Satsuma Interior Enamels. The information regarding undercoatings for new work, given on Page 184, can be applied to Satsuma Interior Enamels.

THE HEATH & MILLIGAN EBONY STOVE PIPE ENAMEL.

Ebony Stove Pipe Enamel produces a durable black, glossy finish on iron work of any description.

Especially made for enameling iron surfaces and particularly adapted for gas, gasoline and oil stoves, stove-pipes, sewing machines, radiators, registers, hot and cold water pipes, gas pipes, sewer pipes, meters, coal hods, garden tools, pumps and iron fences.

Ebony Stove Pipe Enamel prevents rust.

Ebony Stove Pipe Enamel will not flake nor peel off. It is not a quick dryer, consequently forms a tough, elastic coating and one which will withstand a reasonable amount of heat.

Ebony Stove Pipe Enamel dries hard in 24 hours on cold metal.

Ebony Stove Pipe Enamel is put up in quart, pint and half-pint friction-top cans, also gallon and half-gallon cans.

DIRECTIONS FOR USING THE HEATH & MILLIGAN EBONY STOVE PIPE ENAMEL.

Pry up the cover with a coin or nail. Stir the contents thoroughly from the bottom and apply a smooth, even coat with a bristle brush.

Clean rusty articles with sandpaper. Have the surface free from dirt before enameling.

One coat is sufficient to produce an excellent finish with a high gloss.

Ebony Stove Pipe Enamel is ready for use as found in the package. If thinning should be necessary, THIN WITH TURPENTINE OF BENZINE ONLY. NEVER ADD LINSEED OIL TO EBONY STOVE PIPE ENAMEL.

THE HEATH & MILLIGAN BATH TUB ENAMEL.

(Made in white only.)

Especially prepared for enameling bath tubs, sinks, laundry tubs or any surface which comes in contact with water. If applied over a suitable undercoating, The Heath & Milligan Bath Tub Enamel will give an elastic and durable enamel finish which will withstand contraction and expansion without cracking or peeling.

Put up in quarter-pint, half-pint, pint and quart friction-top cans.

As after results depend largely upon the undercoatings, carefully note the following directions.

DIRECTIONS FOR USING THE HEATH & MILLIGAN BATH TUB ENAMEL.

Thoroughly clean the surface with hot water and Sandpaper, being sure to remove all grease. Rinse off with cold water. When perfectly dry, sandpaper the surface with No. 1½ sandpaper. Remove all dust. Apply one thin coat of white lead reduced with turpentine and a small amount of Japan dryer. Allow at least two days for this first coat to dry.

When thoroughly dry, sandpaper with No. 0 sandpaper. Remove all dust. Pry up the friction-top cover with a coin or nail. To be sure the enamel is thoroughly mixed, pour the contents of the can into a clean, dry cup and stir in any pigment remaining in the bottom of the can, and after thoroughly mixing, with a fine bristle or fitch hair varnish brush apply a smooth, even coat of enamel as found in the package. Use a full brush. Apply the enamel freely. Do not attempt to rub out the enamel. If a high enamel finish is desired, two coats of enamel can be applied over the first lead coating. The undercoating of enamel should be reduced in the proportion of one-eighth pint of turpentine to a quart of enamel. Apply a finishing coat of The Heath & Milligan Bath Tub Enamel as found in the package. Be sure all undercoatings are hard dry before applying further coatings. Do not apply the coats too heavily. Allow at least three days for the enamel coat to dry.

Fill the tub first with cold water, draw off part of the water and gradually temper with hot water.

NEVER USE LINSEED OIL IN BATH TUB ENAMEL. IF THINNING IS NECESSARY USE TURPENTINE ONLY.

THE HEATH & MILLIGAN CLIMAX BUGGY PAINT. READY FOR USE.

Climax Buggy Paint is a general favorite for painting and repainting buggies, chairs, furniture, lawn seats, wagons, sleighs or any surface where a hard, glossy and beautiful finish is wanted.

Climax Buggy Paint is an excellent article as a finishing coat on window sashes.

Climax Buggy Paint is ground in a similar manner to our Superfine Couch Colors and is reduced to the proper consistency for use with durable coach varnish.

Climax Buggy Paint dries with a high luster.

Put up in half-pint, pint and quart friction-top cans.

Made in the nine beautiful shades shown on the sample shade card.

DIRECTIONS FOR USING THE HEATH & MILLIGAN CLIMAX BUGGY PAINT.

The surface to be painted must be clean, dry and free from grease, dust and dirt. Scrape off all loose paint. Grease and oil stains should be removed with turpentine or benzine.

Apply Climax Buggy Paint with a clean, flat bristle brush. Work the paint out under the brush with just sufficient pressure to produce a smooth and even surface.

The number of coats required depends entirely on the surface to be painted and the previous coating.

Black, Green and Brewster Green are solid colors and one coat will give a good finish over almost any color, provided the surface is in good condition to receive paint.

In repainting a buggy, carriage or wagon, the fellows are always found to show the greatest wear. To make a uniform job of one-coat work the worn parts should first be touched up with the color to be used. When dry, which will be in about eight hours, coat the whole surface with Climax Buggy Paint as found in the package.

Yellow, Vermillion, Blue, Auto-Red, Carmine and Wine are not opaque and one coat will not cover unless applied over a similar color.

Where a dissimilar color was originally used, two coats of Yellow, Vermillion or Blue should be applied.

Two coats of Auto-Red or Carmine will produce the

Directions for Using The Heath & Milligan Climax Buggy Paint—

Continued.

colors shown on the sample shade card. If used over Vermilion they will show a lighter red. If used over Wine they will show a deeper red.

Wine, if used over itself, will produce the color shown on the sample shade card. If lighter Wine is wanted, Wine can be used over Vermilion; this will produce a rich, light Wine color.

In all cases where two coats are used, the surface should be lightly sandpapered and all the dust removed before the finishing coat is applied.

If a can of Climax Buggy Paint is left open for some time, part of the thinner will evaporate and the paint may become too thick. IN SUCH CASE ADD A VERY LITTLE TURPENTINE, remembering always that too much turpentine spoils the gloss.

NEVER ADD LINSEED OIL TO CLIMAX BUGGY PAINT.

THE HEATH & MILLIGAN WAGON AND IMPLEMENT PAINT IN LIQUID FORM.

Wagon and Implement Paint can be used for general painting where a paint of fair quality is wanted.

Wagon and Implement Paint is put up in gallon, half-gallon, quart, pint and half-pint cans.

Made in the six standard shades shown on the sample shade card.

DIRECTIONS FOR USING THE HEATH & MILLIGAN WAGON AND IMPLEMENT PAINT.

(Carefully note General Directions, Pages 131 to 134, inclusive.)

In all cases prepare the surface and the paint in accordance with directions.

In preparing Wagon and Implement Paint we have taken full advantage of the preserving and filling properties of paint ingredients, the first coat acting as a filler. It produces a smooth and even surface for the subsequent coat, which acts as a preservative.

Blue, Vermilion, Wagon Red, Green and Yellow are for painting either wood or iron, and when thinned for two-coat work should be reduced only with PURE RAW LINSEED OIL.

Black is a varnish color, and is especially recommended for all iron parts on implements, pumps, engines, boilers, etc. It can also be used on wood. Being a varnish color it must be thinned, if necessary, WITH TURPENTINE ONLY.

NEVER USE LINSEED OIL IN BLACK.

For one-coat work, Wagon and Implement Paint is ready for use. Apply it as found in the package.

For two-coat work, which includes all old or weather-beaten surfaces, thin the first coat of Blue, Vermilion, Green, Wagon Red or Yellow with from 25 to 50 per cent pure raw linseed oil, according to the porosity of the surface. If Black is used, thin only with turpentine as noted above.

Do not be afraid of having the paint too thin for the first coat. The body or covering will come out with the second coat.

Allow plenty of time for the first coat to dry before applying the second coat.

Wagon and Implement Paint for the second coat should be used as found in the package.

**THE HEATH & MILLIGAN FAMILY PREPARED PAINT IN
LIQUID FORM.**

Family Prepared Paint is made in the attractive shades shown on the sample shade card; also in white and black.

Put up in pint and half-pint cans.

Family Prepared Paint is strictly first-class and not to be compared with the inferior grades usually put up for inside use.

**DIRECTIONS FOR USING THE HEATH & MILLIGAN FAMILY
PREPARED PAINT.**

The surface to be painted should be clean, dry and free from grease, dust and dirt. All grease and oil stains should be removed with turpentine.

Cut out the full soft top. This is thin tin and can easily be cut with a can-opener or pocketknife.

For all inside work, light and air are necessary for the proper drying of paint. In hot or humid weather paint is apt to remain tacky.

A free circulation of air is absolutely necessary to properly harden paint.

If too thick for any special purpose, add a very small quantity of turpentine.

THE HEATH & MILLIGAN SCREEN DOOR PAINT.

Made in green and black.

Especially prepared for painting window screens. It can be used on both the wooden and wire screens.

Will preserve the wire from rust and the wood from swelling or breaking joints.

The Heath & Milligan Screen Door Paint is put up in quart, pint and half-pint cans.

**DIRECTIONS FOR USING THE HEATH & MILLIGAN
SCREEN DOOR PAINT.**

The surface to be painted should be clean, dry and free from grease, dust and dirt. Scrape off all old paint and broom with a bucket of water or hose can be used to remove accumulation of dust and dirt.

See that the surface is perfectly dry before painting.

If thinning is necessary, USE TURPENTINE. NEVER USE LINSEED OIL WITH THE HEATH & MILLIGAN SCREEN DOOR PAINT.

THE HEATH & MILLIGAN LUNA ALUMINUM PAINT.**READY FOR USE**

Produces a smooth, rich silver finish with a high luster.
Will not tarnish nor turn black.
Adapted for interior and exterior use.
Can be used on any paintable surface.
Will withstand heat and cold and is not affected by moisture.

The Heath & Milligan Luna Aluminum Paint is an excellent rust preventive for metallic surfaces.

Especially adapted for open plumbing, radiators, registers, engines, boiler fronts, letter boxes, lamp posts, hitching posts, stove pipes, interior of ovens, metal ceilings, sewing machines, bicycles, picture frames, beds, chairs and any class of surface where a silver finish is wanted.

Has no disagreeable odor and can be used to repaint over itself.

Put up in quarter-pint, half-pint, pint and quart friction-top cans; half-gallon and gallon round sealed-top cans, and larger packages.

DIRECTIONS FOR USING THE HEATH & MILLIGAN LUNA ALUMINUM PAINT.

The surface to be painted must be clean, dry and free from grease, dust and dirt. Scrape off all loose paint. Grease and oil stains should be removed with turpentine or benzine.

Metallic surfaces must be thoroughly sandpapered to remove all rust.

Stir occasionally while using.

To all porous surfaces a coat of white shellac should be first applied.

With a fitch or camel hair brush flow on a smooth, even coat.

For all ordinary work one coat will produce satisfactory results.

For exposed or heated surfaces two coats are recommended, applied six hours apart.

Keep the can covered when not in use.

If any thinning is necessary, USE TURPENTINE ONLY.

THE HEATH & MILLIGAN ELECTRIC WOOD FILLER.

Made in paste form for use on all porous surfaces.
This Filler is prepared from materials of many years of practical experience and careful selection to be the best surfacers. It fills the pores perfectly, dries rapidly and leaves the work in a fine condition for finishing.

The Heath & Milligan Electric Wood Filler is made in four shades, viz.: Light, Dark, Antique Oak and White.

Light Electric Wood Filler produces a natural white effect, while the Dark Electric Wood Filler produces a dark Medium Antique Oak effect. Antique Oak Electric Wood Filler produces a dark shade of Antique Oak. To lighten to produce any desired effect in the addition of Light Electric Wood Filler. Electric Wood Filler produces on open-grained wood the surface is finished with Orange Shellac effect.

It must be borne in mind that where a finish is desired coating over Electric Wood Filler the effect of the wood depends entirely upon the color of the shellac. White Shellac will produce the natural shade, while Orange Shellac will give it a golden effect. Any desired effect can be produced by mixing in proper proportions of Orange and White Shellac.

Electric Wood Filler is put up in 1, 2, 5, 10, 25, 50, 100 pound cans, 100 pound kegs, half-barrels and larger packages.

DIRECTIONS FOR USING THE HEATH & MILLIGAN ELECTRIC WOOD FILLER.

After the wood is properly dressed, the surface should be immediately used with either turpentine or benzine.

This should be of a priming coat color and applied as follows:

5 pounds Electric Wood Filler.

1½ pints Turpentine or Benzine.

This sets very quickly and can be touched up work on hand by the addition of a few drops of oil.

The oil will also keep the Filler from drying out the pores of the wood.

Keep the mix well stirred at all times.

Flow on a coat with a bristle brush.

Directions for Using The Heath & Milligan Electric Wood Filler—
Continued.

is partly set or turning white, wipe off with excelsior or burlap, rubbing across the grain, removing all that will not rub into the grain.

Have a sharp-pointed hardwood stick to clean around the mouldings and grooves. Do not use a putty knife, as it will leave black marks.

Let the filled wood stand from 8 to 12 hours; this will allow the Filler to thoroughly harden.

Sandpaper thoroughly, dust and coat with shellac or Light Liquid Wood Filler.

Sandpaper lightly and finish with one or more coats of Light Hard Oil Finish. Ask for our booklet: "Superfine House Finishes and Instructions for Finishing Natural Woods."

H. & M. FLAT BLACK. READY FOR

For interior decorating or finishing color work which is to be varnished.

Prepared from the highest grade Ivory ground in Japan, reduced to "ready for use" color with turpentine and the necessary binder.

Dries quickly and flats perfectly.

Produces a dead black finish on any metal surface. Suitable for use on lamps, chandeliers, similar metallic surfaces, producing a wrought iron effect. Also suitable for use on picture frames, mouldings, grill work or any wooden surface where a dead black finish is wanted.

For interior work it can be applied to either a finished surface, but where it is to be used on a new surface better results will be obtained if the surface is first primed with a thin mixture of Lead Color Paint, putty and turpentine to stop absorption and allow drying.

For store fronts, signs or any exterior work to be finished in gloss, the surface, according to the nature of the surface, should first receive one or more coats of Lead Color mixed half flat with turpentine. When thoroughly dry, apply a finishing coat of Flat Black, allowing it to thoroughly harden, and finish with exterior varnish.

Put up in half-pint, pint and quart friction-top half-gallon and gallon square cans.

DIRECTIONS FOR USING H. & M. FLAT BLACK.

The surface to be painted should be clean, free from grease, dust and dirt. All grease and dirt should be removed with turpentine.

H. & M. Flat Black should not be applied to a glossy surface. If the surface has been painted or varnished, the gloss must be cut by thoroughly sandpapering with No. 0 sandpaper.

Stir thoroughly from the bottom up with a stick and use as found in the package. Occasional stirring while using.

Apply a smooth, even coat with a camel hair brush.

Do not apply Flat Black too heavily. A heavy coat will not dry.

Directions for Using H & M Flat Black—Continued.
 very apt to crack through contraction and expansion. If
 two coats are applied, be sure the undercoating is thorough-
 ly dry before applying the second.

Keep the can covered when not in use.

If any thinning is necessary, USE TURPENTINE ONLY.

THE HEATH & MILLIGAN LIGHT LIQUID WOOD FILLER.

This is a substitute for White Shellac as a surfacer for
 inside finishing.

Excellent as a filler for all close-grained woods, also for
 open-grained woods which have been filled with paste filler.

It renders a perfect foundation for a finishing coat on
 any kind of wood.

Covers more surface than shellac.

Is applied the same as shellac or varnish.

Does not require rubbing off.

Penetrates the wood to a proper depth, closes the pores
 and absolutely prevents suction, absorption or sinking in of
 the varnish or other outer coats.

Is perfectly transparent and will not discolor the lightest
 wood.

Will not crack nor peel.

Does not raise the grain of the wood.

Is ready for use.

If thinning should be necessary, through loss by evapo-
 ration or otherwise, USE TURPENTINE ONLY.

Put up in pint, quart, half-gallon and one-gallon round
 cans, three-gallon and five-gallon jacket cans, half-barrels
 and barrels.

THE HEATH & MILLIGAN BEST GRAINING COLORS.

If the work to be grained is white pine, the surface must first receive a coat of white shellac or Light Liquid Wood Filler.

Apply two coats of paint, mixed half flat and tinted to the proper ground color for the work in hand, allowing ample time between coats for thorough hardening.

Putty all seams and nail holes between coats.

Sandpaper lightly between coats.

If three coat work, tint to shade and apply the first coat half flat; the second coat with an eggshell gloss.

Putty between first and second coats.

Thoroughly sandpaper and finish with paint mixed half flat.

As a suitable ground color on new work which has been sized or as a foundation color over a painted, varnished or stained surface, we recommend H. & M. Ground Color, see Page 181.

This is of a uniform light shade, but if a redder effect is desired it can be changed by the addition of a small amount of Dry Burnt Sienna.

The Heath & Milligan Graining Colors should be reduced with 2-3 turpentine and 1-3 boiled linseed oil to the consistency of a stain.

Apply with a bristle brush, having very little color in the brush, and rub out thinly and evenly. Comb and wipe out according to the wood to be imitated.

When hard dry, apply one or more coats of finishing varnish.

CAUTIONS.

Be sure and prepare a suitable shade of ground color, as the natural effect depends largely on this undercoat.

All undercoats must be hard dry before applying subsequent coats. If these coats are not hard dry, the work is bound to crack.

Graining colors should not be applied as a paint. They are glaze colors and should be reduced and applied as before mentioned.

The graining color must be dry before the varnish is applied. If not, the varnish will remain tacky and crack.

THE HEATH & MILLIGAN SUPERFINE COACH COLORS.

Our Superfine Coach Colors are of the highest quality in every respect, excelling in beauty, brilliancy, durability, clearness of tone and fineness of texture. They are ground to the last degree of fineness, meeting every requirement demanded of a product of this kind and giving absolute satisfaction when properly used. The dry colors used in the manufacture of Superfine Coach Colors are either of our own manufacture or direct importation and are of the highest standard possible to obtain.

Superfine Coach Colors are ground in a preparation according to their requirements. They dry quickly, flat perfectly and possess the necessary binding properties. They should be thinned with turpentine only, but if they dry too quickly, the drying may be retarded by adding raw linseed oil or a little rubbing varnish in such proportions as experience may dictate.

To properly break up the Japan color, take a given amount, place it in a mixing cup and beat it up thoroughly; then add a small amount of turpentine, thoroughly beating this into the color. Repeat this operation and when the material has reached a semi-paste consistency, the remainder of the thinners should be gradually added until the paint is a proper consistency.

We do not guarantee satisfaction from the use of our Coach Colors if Japan, or any material other than turpentine, raw linseed oil or rubbing varnish as directed is used in mixing them.

The colors shown on the sample shades appearing in our Coach Color book have been applied over a suitable ground color in order to illustrate the true tone and color value of our Superfine Coach Colors as found in the package.

Superfine Coach Colors are put up in 1 lb. cans; 5 lb. and 10 lb. pails; 5 lb. and 10 lb. press cans, each with a patent soft top and each package accompanied by a tight-fitting extra cover, which can be used after the top has been cut out.

As a guide to prepare suitable ground colors so that our Superfine Coach Colors will produce the same effect as shown in our Coach Color Book, we show sample shades of the grounds used in our sample card department in preparing Sample Shades of our Superfine Coach Colors.

In preparing a ground color for the work in hand, a lighter or a deeper effect can be obtained by making a corresponding change in the ground color.

THE HEATH & MILLIGAN WIZARD PAINT AND VARNISH REMOVER.

Removes paint, varnish and shellac.

Easy to apply, quick in action, will penetrate to any reasonable depth, will not spot, blacken nor raise the grain of the wood.

Can be applied over a large surface.

Cleans to the original surface quickly and perfectly.

No bleaching is required after using Wizard Paint and Varnish Remover.

While Wizard Paint and Varnish Remover does not contain turpentine nor benzine, it should be handled with the same precaution as to exposure to a naked light as one would exercise with turpentine, as the solvents used are more or less volatile and inflammable.

Wizard Paint and Varnish Remover is so prepared that it forms a surface film, stopping evaporation and allowing of penetration, also assisting in holding the Remover to an upright surface.

Wizard Paint and Varnish Remover will be found of a different consistency in summer than in winter. It is easily tempered according to weather conditions for either a flat or upright surface, making the one Remover adapted to either surface.

Put up in half-pint, pint, quart, half-gallon and gallon square cans, and larger packages.

DIRECTIONS FOR USING THE HEATH & MILLIGAN WIZARD PAINT AND VARNISH REMOVER.

Shake the can vigorously and for end before opening.

If found too heavy in cold weather place the container in a pail of water registering 80 to 90 degrees, or too thin in hot weather, place the container in a pail of water registering 50 to 60 degrees; this brings the Remover to any desired consistency.

If found too limpid for summer use on an upright surface, starch, carbonate of magnesia, whiting or any inert pigment can be mixed with it to form a paste consistency without detriment to the Remover.

With a flat brush which is set in glue, apply a heavy coating of the Remover and allow it to remain on the surface until the paint or varnish is thoroughly softened. Then

Directions for Using The Heath & Milligan Wizard Paint and Varnish Remover-Continued.

clean the surface with a scraping knife.

Moldings, beaded work, etc., on which a scraping knife can not be used, can be washed off with turpentine applied with a brush or rag.

If a second application of the Remover is necessary, remove the softened surface before applying the Remover a second time.

Do not cover a larger surface than can be handled with in a reasonable length of time.

As fast as finished, clean the surface with turpentine or benzine.

Wizard Paint and Varnish Remover will thoroughly clean any old, dirty, lousy paint or varnish brush. No matter how long the brush has been standing or how hard set with paint or varnish, Wizard Paint and Varnish Remover will loosen every particle of old, hard paint or varnish, both in the bristles and on the handle, restoring the brush to a useful condition.

DIRECTIONS FOR CLEANING BRUSHES WITH THE HEATH & MILLIGAN WIZARD PAINT AND VARNISH REMOVER.

Take a cup or vessel proportionate to the size and number of brushes to be cleaned; put the brushes into the cup; then pour into the cup enough of the Remover to cover the bristles or hair; let stand until the Remover has cut through and loosened all of the paint. From time to time manipulate the brushes so as to separate the bristles, thus allowing the Remover to reach all parts. After all particles of the old paint are loose, wash the brushes in either turpentine or benzine. You will then find them in almost perfect condition.