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PAINTING PLASTER[1]

Paint failures on plaster cannot always be attributed to the same causes as those on wood or metal. As more failures (flaking) occur on ceilings than on side walls, due to the fact that ceilings are more exposed to leaks from above, the general tendency is to attribute all failures to moisture back of the paint. While moisture back of the paint is the most frequent cause of failure, numerous instances have also occurred on bone-dry plaster where subsequent laboratory examination disclosed a fine soft non-coherent powder present on the flakes. Examination of the surface from which the paint flaked showed it to be hard and smooth, indicating that the plaster had not been affected.

This fact, with the evidence of powdered plaster on the flakes, indicates a change in the film of plaster next to the paint. This failure, however, is not necessarily connected in any way with the strength of the plaster as a whole, or with the falling of solid pieces of plaster.

The common causes of failure are the too rapid dehydration of gypsum under very dry laying conditions, alternate wetting and drying of plaster, and the mechanical action of water back of the paint film. The latter cause is destructive in that there is always some hydrated

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[1]This is a brief digest of Letter Circular 304, "Painting Plaster", (January 27, 1933), available from the National Bureau of Standards, Washington, D. C. (Free).

lime present in the plaster which would cause the water to become alkaline; thereby tending to destroy (saponify) the oil in paint. This condition, more commonly known as "hot spots", may be rectified, in the opinion of some authorities, by washing the walls and ceiling with a solution prepared by dissolving 3 to 4 pounds of crystallized zinc sulphate to one gallon of water. The value of such treatment, however, has been questioned.

One of the best treatments for a plaster surface is as follows: After the plaster has thoroughly dried, (this being very important), and then slightly roughened on the surface by sandpapering and well dusted, a size coat of water-resisting varnish thinned with turpentine or mineral spirits should be applied. After this has dried, a first coat of paint containing considerable boiled oil should be brushed on. Thereafter, the fewest possible number of coats should be applied to obtain the desired results.

There are also special primers on the market consisting of opaque pigments in vehicles which it is claimed prevent variation of gloss or color due to uneven absorption. Such primers are intended to replace, in one operation, the varnish and first coat mentioned above. A specification for these primers is covered in Federal Specification TT-P-56,[1] and is briefly discussed in TIBM No. 11.

When the desired appearance can be obtained by the use of an oil stain on plaster, a durable finish free from flaking might be assured. The surface of the plaster is first slightly roughened with sandpaper or steel wool, dusted thoroughly, and one coat of thin stain is then applied, the object being to have the stain penetrate and color the plaster. Only lime-proof pigments should be used.

One of the oldest and most durable methods, the fresco process, while particularly well adapted to the modern methods and demands for speed in finishing, is seldom used or heard of. In this process, finely-divided lime-proof pigments suspended in pure water, with or without the addition of hydrated lime, are applied to the wet plaster. A partial penetration of the pigments into the plaster takes place, drawing the solution of calcium hydroxide to the surface. This solution surrounds the pigments and, by reaction with carbon dioxide in the air, is converted into calcium carbonate which binds the pigments to the surface and makes them a part of the plaster. Fresco painting should be done the same day the plaster is applied.

While this method may be carried out with brush or sponge, spraying and mottling with sponge or paper is probably a better method.

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[1]Available from Superintendent of Documents, Government Printing Office, Washington, D. C. (Price 5 cents)

Walls can be completed within twenty-four hours, effecting savings in cost of materials, labor and particularly time, assuring a finish that outlasts paint. Should redecoration be desired, the plaster would be in better condition for the application of paint.

Casein binder water paints may be applied with promising results to damp walls and are probably the safest kind of paint for plaster that has hardened though not thoroughly dried. The film produced is more porous, allowing water to evaporate with less danger of flaking than with oil paints. Casein paints are of such recent origin that no positive opinion can be given of their durability. A specification for this type of paint is covered in Federal Specification TT-P-23.[1]

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[1] Available from Superintendent of Documents, Government Printing Office, Washington, D. C. (Price 5 cents)