

## Mixing your Own Glair and Watercolor

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First, some definitions:

**To Temper:** to mix ground pigment with a binder

**Pigment:** the source of color in a paint. Most are mineral-based, from metal oxides, crushed precious stone, and colorful clays. Some were lead or mercury-based, and care must be taken, but most are safe if not swallowed. Some are organic-based, primarily cochineal, redwoods, and indigo/woad.

**Binder:** the medium that affixes the pigment to the background. Common binders are:

- Gum Arabic –flexible when dry
- Egg whites – remains soluble in water.
- Egg yolks – dries quickly to waterproof.

**Types of tempered paint:**

- **Gesso** – layer of rabbit glue + chalk + limestone, used to fill in the pores of a surface.
- **Gouache** – pigment + whitening + Gum Arabic.
- **Watercolor** – pigment + Gum Arabic
- **Tempera** – pigment + egg yolk. Waterproof upon drying. Dries fast, mix in small amounts.
- **Glair** - pigment + egg white. NOT waterproof – can rewet & rework. Can be brittle.

**Classical pigments:**

Blacks: **Charcoal**, Lamp Black, Bone Black.

White: Chalk, **Gypsum**, Lead White

Yellow: Yellow Ochre. Orpiment+, **Yellow Lead**+, yellow vegetable (?)

Red: **Red Ochre**, Cinnabar+, Dragons Blood, Red Lead+, Red Lake+ (Madder & Kermes in gypsum & lime)

Blue: Azurite+, **Egyptian Blue\***, Indigo Lake (vat skimmings)+

Green: Malachite+, Verdigris+, Terre Verte+

Purple: Tyrian Purple\*+

**15<sup>th</sup> Century Pigments:**

Yellow: yellow vegetable (?), **artificial Naples Yellow**

Red: **Stick Lac Lake (Lac)**, **artificial Vermillion (8<sup>th</sup> C)**, **Crimson Lakes (Cochineal, Brazilwood)**

Blue: **Azurite, Ultramarine (Lapis Lazuli)**

Green: **Malachite, Verdigris, Terre Verte, Verdigris in pine balsam**

**Modern/Niche culture Pigments:**

White: Zinc White, Titanium White

Yellow: Chrome yellow, Cadmium Yellow

Blue: German Blue, Cobalt Blue, artificial Ultramarine, Cerulean Blue, Blue Verditer/Bice

Green: Veridian, Cobalt Green, Green Verditer/Bice

**Bolded** colors were specifically mentioned or used in that time period.

*\*Starred colors are no longer easily available*

*+Plussed colors were mentioned by the Natural History of Pliny the Elder (A.D. 77-79)*

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### Process:

Until the 14<sup>th</sup> century, most illuminations were painted with glair. Later, it was often mixed with gum Arabic. It was a common practice to mix the paint in a seashell. (The seashell was supposed to provide some trace element, which improved the paint.)

### Recipe for Medieval Paints:

#### Equipment:

A coffee grinder or equivalent  
A sea sponge or loufah (look in the bath section of the grocery store)  
A bowl  
A small sealable container for the egg weep  
A small eyedropper/medicine dropper  
A paintbrush

#### Supplies:

Good paper that doesn't bleed  
1 seashell per pigment  
Eggs (start with 4)  
Pigments (see below for suggestions)

1. Separate the egg whites and yolks.
2. Use the sponge to froth the egg whites until the bowl is full of foam.
3. Let the egg white sit overnight, then carefully pour the liquid at the bottom (the "weep") into the sealable container. It can be saved indefinitely – experts say egg weep improves with age. (But it can smell pretty bad – you'll want to keep the container sealed!)
4. Grind the pigment fine – somewhere between the consistency of sugar and flour. If it is too coarse, the grains will clump on the page. If it is too fine, it will be too watery. Experiment – each pigment has its own perfect consistency.
5. Put a little pigment in the shell, then a drop of egg weep.
6. Mix it with the end of a paintbrush & test. If it is too thick, add another drop of egg weep.
7. Add a drop of water to either use immediately, or allow it to dry. Add water to use it as a watercolor. Add egg weep to use it as a glair.

#### To make your own Pigments:

Black: Collect soot from lamps, bottom of cookout pots,  
Put bones or grapevine in a sealed container with a single hole, toss in fire. (Anaerobic)

White: Ground egg shells for pure chalk.  
Grind gypsum (stone).  
Burn bone until white ash.

Red: Gather red clay.  
Create madder/cochineal dye with alum, precipitate with alkali (chalk)

Blue: Use skimmings of indigo pot),  
Grind azurite (don't grind too fine)

Green: Vertigris (leave old pennies in vinegar for a week, let the solution crystalize),  
Gather Terra verte (green clay)

Yellow: Gather yellow clay

Other ideas: Find colorful dry substances – such as coffee grounds or dried peas. Use Easter egg dyes to dye eggs, then grind the eggshells.

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### Resources:

Natural Pigments. (323 661-9471) <http://www.naturalpigments.com>. Also sends out a great newsletter.

Griffin Dyeworks. [www.griffindyeworks.com](http://www.griffindyeworks.com)

Earth Guild. (800-327-8448) [www.earthguild.com](http://www.earthguild.com)

Aurora Silk. (503-286-4149) [www.aurorasilk.com](http://www.aurorasilk.com)

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