Egg Tempera

Preparing the binder Separating the egg

The egg must be fresh (choosing eggs for tempera) Use the yolk only without any white in it. The percentage of albumen in the white of the egg is too low to make good paint. Crack the egg horizontally and carefully pour the egg from one half shell into the other. Catch the white in a plate or sink. It is easiest to hold the yolk in the fingers, allowing the white to slip between the small gaps, but it is less messy to buy a purpose made egg separator that does the job for you. You find them in kitchen supply stores. However you do it, it is important not to break the yolk membrane at this point.

When the yolk is separated gently dry it taking care not to break it yet. During the renaissance artist's like Cennini would have dried it by passing it from one hand to the other, wiping each hand in turn on his apron. Rolling the yolk on a paper towel achieves a similar result. Transfer the yolk to the flat of the palm when it is dry. You are ready to extract the contents. Use the thumb and index finger to lift and hold the yolk sack over a clean glass. This is where freshness counts as the membrane weakens with age and only fresh eggs will be able to be handled in this way. Puncture the skin at the bottom of the yolk with sharp knife, avoiding any skin fragments getting into the glass. A stanley knife or scalpel are ideal for this cut. Allow the yolk contents to fall into a clean glass jar. Cleanliness of equipment is important when dealing with a paint that can potentially spoil and ruin an artwork. Discard the yolk sac.

Care in obtaining the cleanest and purest yolk in this way will make better paints and avoid trouble with the paint film further down the track. The separated yolk is now ready for use in paint making, although it is common to mix a little distilled water into the yolk.

Grinding Also called dispersal

The pigment should have been predispersed. Predispersal is all the grinding Egg Tempera must have as it is sufficient to mix the egg and pigment paste with a spatula just before use. Pigments will require approximately equal proportions of pigment to yolk. Exact proportions for several common pigments are listed below. A drawdown will reveal any problems with your mixing.

If it is preferred to grind using the muller work quickly to avoid drying problems. The photograph shows how to hold the muller. Grind in a circular motion. Do not use a lot of pressure as the pigment particles are already finely ground, and the action of mulling is to evenly disperse the pigment through the egg binder.

Scrape the mulled paint into the center for inspection. Do a quick drawdown. (How to do a drawdown). Egg Tempera made from predispersed pigment paste will only need the one mulling. Experience teaches you the subtle difference between when the pigment is insufficiently dispersed and when the dispersal is complete, as a well dispersed paint handles differently to one where the particles are clumped or otherwise imperfectly dispersed.

Trouble shooting
Three tests are useful. Dabbing a little paint on clean glass and letting it dry. This will reveal if you have enough binder to pigment as too little egg will make a paint that crumbles. Well made paint should have a strong film. Also wiping a dry area of Egg Tempera paint with a dry cloth should leave no color on the cloth. Any color on the cloth indicates poor dispersion or insufficient egg yolk. The smell test will indicate paint which is 'going off'. Immediately discard any paint that is spoiling, and scrape off the picture any paint that was used from that batch just beforehand. Spoiled paint can destroy pictures.

Andreas Fokas, the foremost Egg Tempera painter in Greece who has painted icons and still life for 60 years recommends two to three drops white vinegar added to each yolk depending on its size; it acts as preservative and 'cuts the black' according to him. This applies to all colors although the caution should be observed whenever using any acidic substance around Ultramarine blue as discussed below.

To one part of each of these pigments add the specified volume of egg yolk.

* 1 part Titanium White to 1-1/4 part egg
* 1 part Cadmium Yellow to 1 part egg
* 1 part Yellow Ochre to 1 part egg
* 1 part Raw Sienna to 1-1/4 part egg

* 1 part Raw Umber to 1 part egg
* 1 part Burnt Umber to 1-1/4 part egg
* 1 part Burnt Sienna to 1-1/4 part egg
* 1 part Venetian Red to 1-1/4 part egg
* 1 part Quinacridone Rose to 1 part egg
* 1 part Cadmium Red to 3/4 part egg
* 1 part Ultramarine blue to 1 part egg
* 1 part Viridian to 3/4 part egg
* 1 part Ivory Black to 1 part egg

Ultramarine Blue
Some authorities suggest that Ultramarine is not a wise choice of blue. According to Doerner this is because of the formation of hydrogen sulfide due to the reaction of the Ultramarine with the yolk constituents. The solution is to mix gum solution with the egg yolk although it is not clear as to why this would affect the formation of the hydrogen sulfide. It does seem however that this is a problem most associated with storage of the Ultramarine as it is most prevalent in tubed Egg Tempera. It should be noted that Cennini includes Ultramarine as an Egg Tempera color and makes no mention of gum additions. This might explained by his expectation that the tempera would always be fresh made and used, although he often left out simple things that he thought were common knowledge. Anyone concerned about the use of Ultramarine can use any of the other major blue artist pigments available.

Of greater concern is the common practice of adding vinegar to any tempera that contains Ultramarine. Ultramarine is very sensitive to even weak acids and can potentially bleach catastrophically. While the tiny portion used as a preservative is likely too little to be trouble in this regard, it may affect the color. It is just another reason to make the color fresh and use it immediately.

Storing the tempera Tubes or jars?
While it is perfectly feasible to store Egg Tempera in tubes this is usually not done. Partly that is to do with traditions that grew before the tube made the storage of a paint based on a food product feasible. From the beginning tempera artist's have made their paints fresh and used them up either the same day, or within

48 hours at most. So, by logic with modern refrigeration and the excellent sealing properties of the collapsible tube we should expect to make the paint last a long time. Problem is, it is not so simple. Refrigeration is not advisable and while there are commercial tubed Egg Tempera paints on the market that have preservatives to prevent the paint spoiling, these colors are not hugely popular because the fresh made product is so clearly better. It seems despite logic the paint does change with storage in subtle ways and in the end the tempera artist is better off making smaller quantities every day or two as part of the painting ritual. In that case there is little point in the expense of the tubes and most Egg Tempera paint is stored in washable and reusable small glass jars. The cleaning needs to be perfect as potential sources of spoilage need to be eliminated. A couple of dozen empty jars bought new will last many years of painting usage and are very cost efficient.