

About egg yolk and other traditional paint binders

Powdered artist's pigments need to be 'tempered', or mixed, with something to make them stick to the surface being painted. Factory-prepared paints all contain a binder of some kind, whether that be acrylic, gum arabic (watercolour) or linseed oil (oil paints). By preparing your own paints you gain the advantage of complete control over colour concentration and consistency, and you will also know the toxicity (if any) of the ingredients. However, traditional binders such as egg yolk or rabbit skin glue go rancid and generally the paint must be mixed and used fairly quickly. With the exception of gum arabic, all the binders discussed here will dry out quickly in the palette: as they dry they begin to polymerise (form a waterproof plastic film) which means that they cannot be reconstituted - you must mix fresh every time.

Egg Yolk

Since the early middle ages, paintings on wood panels have traditionally been produced in egg tempera. Before that, artists used pigments in beeswax (encaustic) melted and manipulated with hot rods. During the Renaissance, egg tempera was gradually supplanted in popularity by oil paint on canvas, but it is enjoying a revival among contemporary artists, especially for portraiture. Egg yolk is a semi-opaque medium: it can be used translucent like watercolour or nearly opaque like gouache. It is more bright and vibrant than gouache, in which the intensity of the pigments is diluted by a chalky carrier. Over time, egg tempera dries waterproof and very hard: at first the surface is very easily damaged, but after six months or so it can hardly be scratched off with wire wool. I know, I've tried it. The obvious disadvantage of egg yolk as a binder is that it goes off quite quickly at room temperature: Gorky famously described the stench of the icon workshop in his autobiography. To extend its life, mix binder and pigment only as you immediately need them (choose pigments which are fine enough to be mixed in the palette) and keep the egg base in the refrigerator, extracting a small quantity for a painting session which can be discarded when it has sat on your desk for a few hours. I add a few drops of vodka to the mix which helps preserve it a little longer – a week in the refrigerator. Vinegar is even more effective as a preservative, but may react adversely with pigments such as ultramarine. When it goes off, the egg mix starts to string out and be difficult to mix with – discard it quickly before it begins to stink.

Recipe: Use a good fresh egg from a chicken which has been well treated – apart from any moral considerations, this affects the thickness of the membrane and how easy the yolk is to handle. Crack the egg and drain off the white; dry the yolk on a kitchen towel or between your hands; pierce the membrane with a skewer and allow the contents to run into a small jar. Add water to taste (I use a 50:50 mix), a few drops of vodka and mix. The viscosity of the yolk varies according to the season and diet of the chicken, or so I suppose, so how much you dilute it will depend on circumstance and your own painting preferences.

Egg White (Glair)

Egg yolk needs a rigid support and therefore was not very useful for manuscript painting as it would eventually peel off the vellum. It is also greasy, and would leave a stain on the opposite page. Some yolk might have been used to enhance certain colours, but until the later Middle Ages manuscript miniatures were mainly painted using glair. Glair was made from the egg white, presumably the ones that were left over from painting wood panels with egg yolk. The proteins of egg white must be broken down by beating to make a runny substance for mixing paint. Various other ingredients, such as clove oil or honey, can be added to improve the smell or make colours richer and glossier. Glair was kept indefinitely. Mine has been in the refrigerator for two years and is still clear. Many practitioners keep the jar at room temperature, and swear that it improves in strength and handling as it gets darker and smellier. Your choice.

Recipe: Beat your egg whites to stiff standing peaks and then put the bowl in the refrigerator

for a few hours. Reserve the liquid which separates out underneath and discard the foam on top. You can add a few drops of honey or gum arabic to improve the flexibility of the paint film and the depth of colour. Mix undiluted with pigment.

Gum Arabic

Eventually gum arabic supplanted glair as a binder for painting manuscript miniatures, perhaps because it is more convenient to use, less smelly and if the pigment is ground sufficiently fine the paint is more delicate. It is also the chief constituent of all commercial watercolour paints, whether in tubes or palettes, with the addition of various humectants and substances to improve mixability and flow. One can buy a bottle of ready-dilute gum arabic at any art shop, and if you prefer an easy life I suggest you do so. Alternatively you can buy crystals of gum arabic ('Kordofan' is the superior variety) and prepare your own. Use only a little drop with pigment and dilute with water – too much binder will be unpleasantly shiny and prone to cracking off.

Recipe: Crush some lumps of gum arabic in a pestle and mortar. Use 1 teaspoon (15ml) of powdered crystals to 1 fluid ounce (30ml) of distilled water. Allow the crystals to dissolve in the water over several days or place in a jar of hot water to speed up the process. Strain the solution through an old stocking into a storage jar and store with the lid on.

Casein

I mention casein and size (below) mainly for the sake of thoroughness. Casein is a form of milk paint, and to make it is such a performance – involving borax and milk curds - that I shall not include a recipe here. It was once used for household paints and you can find recipes elsewhere on line – usually in huge quantities that have to be used up quickly because the paint goes off. However, casein paint has properties which make it very useful – for example it will happily paint on a shiny surface (such as gold leaf) where egg tempera will only bead up, and being very thick will better cover the edges of a gessoed panel than egg. It can be mixed with, and used under or over egg tempera. Like egg tempera, it eventually dries waterproof. You can bless your stars that casein paint is available as a commercial preparation, sold as a craft paint under the brand name Plaka. The colours are not subtle, but you can modify them with artists' pigment. You can also buy a clear casein binding medium, commercially produced with a preservative by Schminke. It is extremely gelatinous and I find it is best mixed with pigments and water using a muller and slab.

Size

Size simply means glue. Various animal glues are traditionally used, the usual choice for artistic purposes being rabbit skin glue which comes in granule form like gelatine and must be pre-soaked and then dissolved in water. Mixed with whiting and tinted with oxides, it was the binding ingredient in distemper, the powdery whitewash once used on house walls and ceilings. Mixed in a higher concentration with chalk whiting or calcium sulphate it produces gesso, the traditional surface for fine painted furniture and for panel paintings. Size coloured with pigments makes the paint used for traditional theatre scenery drops. As you would expect from an animal-based glue, it goes off after a few days (after a few hours if continually reheated) and gives off a unique stench of wet and rotting blanket which takes me back in an instant to Mr Mackinder's art room at school. It is gelatinous at room temperature and must be kept warm, but will break down and be useless as a binder if you overheat it.