

## CHAPTER I

## THE MAKING OF COLORS

For the making of colors it is necessary to have a copper boiler that is strongly tinned, the capacity of which depends upon the quantity of colors that you will want to make at a single time, several sieves, wooden casks, straining bags and other receptacles for keeping the colors, for precipitating and washing them, cloths for filtering, stones for grinding and mullers, a grinding mill, when one wishes to produce in quantity, a mortar, etc.

I especially recommend making a good selection of colors, of salts and acids, and not purchasing anything but of the first quality, even when the price may be very high, because these qualities pay back more and furnish the most beautiful nuances. It is likewise necessary to maintain extreme cleanliness in this manufacture, washing very well the utensils and the receptacles each time one wishes to prepare other colors. It is also important to employ river water or rain water, but in the event that these waters are lacking, one can avail oneself, for washing, of well water, provided that it is very clear.

The colors generally necessary for the preparation of fancy papers that one can make are the following:

Carmine lake, red lake, yellow, violet, imitation blue and black, Berlin blue and Prussian blue, fine chrome yellow. There come after these other colors, some of

which are natural and others the products of large manufacturers that require vast establishments and a considerable amount of capital; and it is important, besides, to procure the finest quality because, in a pinch, it is more worthwhile to mix them with whites and other bodies than to purchase them already mixed in proportions we are unaware of and from substances that are unknown. The natural colors are:

Earth yellow, Italian earth yellow [raw Sienna], Cassel earth, calcined Italian earth [burnt Sienna], Wales black.

The manufactured colors are: vermilion, orange lead, ultramarine, ceruse, silver white, Schweinfurt green, fine blue (called Paris blue or ash blue), washing soda, alkaline and alkali salts, alum, vitriol, lead salts, nitric, muriatic and tartaric acids.

False gold and gold leaf come from Germany (Nürnberg): it is available in a large number of qualities, of which one finds two kinds, large and small size, the small size being the more beautiful. The kinds with the trademarks, Espermuller, J. Caspar Mayer, Fuchs, are the most employed, but only for the papers that are gilded in leaf; for other works that are imprinted, these kinds are too robust, and they do not allow themselves to be conveniently wiped clean; in this case, it is necessary to then get hold of one marked Cubler, Linz. For ordinary works, you choose the large size of the same maker, and according to the price that one wishes to expend: the redder the gold is, the less expensive it is. It is the same with the bronze powder, the price of which varies according

to its fineness. The trade marks are from No. 1 to 2000. According to shades, these are distinguished by the designations English green, the color of gold, Parisian, natural, orange, citron, pale yellow, silver and false silver, carmine red. It is always expedient to get hold of the fine kinds, because the finer they are, the more color they provide. The ordinary kinds are commonly mixed with litharge. The better colors are: English green, the color of gold, natural, or, if one wishes to stamp in several colors of gold, then it is necessary to get hold of several tones that are contrasting, namely English green gold, citron, etc.

The bronzes are likewise made in England, of which the types are very fine, and cheaper; but this other bronze is made in another manner, which renders it lumpy and greasy and causes it to easily become black.

Prior to commencing the making of these colors it is necessary to have made ready all of the objects that will be necessary for that manufacture, either the acids, the body and tin solution, or the utensils, above all the filtering apparatus (which consists of a square frame of approximately eighty centimeters sideways two and a half feet square), on which is attached at its four corners the cloth for filtering, and which is mounted on a trestle at its four feet. In the establishment where the manufacture will be considerable, an overseer or special workman is occupied with no other duty than the preparation of the colors, but in the case of a maker on a small scale, he can employ his time by making other things during the interval that it takes for the color to arrive at the boiling point; but immediately upon boiling, it is mandatory to attend to it, to stir it,

to keep an eye on it, especially when you are making lake colors. One must, moreover, take care that he does not allow it to boil for too long a time, otherwise the color goes by the boards and produces dull tones.

#### Section I. PREPARATION OF THE ALUMINUM SERVING TO GIVE BODY TO THE COLORS.

You dissolve alum by heating it in a copper boiler with ten parts of river water, and when the alum is entirely dissolved, pour it into a wooden tub that is sufficiently high so that when the potassium is added, the effervescence that manifests itself does not force the contents to pour over the sides.

Then you rinse the boiler until no alum remains, and take up the potassium, called pearl-ash, in a quantity of half the weight of the alum, which is then uniformly dissolved in from eight to ten parts of water, remove it from the fire, and allow it to rest. Quite often it happens that the potassium leaves a residue; but when the solution has become well clarified upon resting, pour it into the wooden vessel onto the alum, very gently and in small drops, stirring it constantly with a stick, after which it is allowed to settle for from six to twelve hours; the liquid clarifies shortly afterwards, and the aluminum is precipitated to the bottom.

It is necessary that the wooden vessel be pierced at different depths with several holes, which are stopped up by plugs that can be removed at will; you then remove the plug that is above the precipitate and permit the water to flow off, plug up the hole again and refill the vessel with water; you shake it, let it

rest and allow the water to pass off, repeating this operation for from five to six times, to the point that the precipitate doesn't have more than the least taste. It is then poured through a filter in order to allow all of the water to drain off, after which you conduct it into a bottle to preserve it until needed. It is necessary to pour a little water on top so that the aluminum does not dry out, and you keep the bottle well covered so that dust does not come to contaminate it.

#### Section II. THE DISSOLUTION OF TIN.

Muriatic acid.....	3	parts
Nitric acid.....	2	—
Ammonia salts.....	1	—
Water .....	8	—

Put the muriatic acid and the nitric acid into a bottle that is large enough and is surrounded by straw and drop into this, little by little, pure tin wire until the acid has been sufficiently fed and will no longer attempt to dissolve the metal, a circumstance that is apparent when the acid does no longer emits reddish fumes; then you add, always little by little, the ammonia salts that have been dissolved in water and let this rest.

#### Section III. THE METHODS OF MAKING THE COLORS.

##### I. Red and Violet Colors.

###### A. Red Lakes.

No. 1. *Carmin Lake*. Take one part of cochineal, crush it on a grinding stone, not too finely, and put it over a

fire in an extremely well tinned copper boiler together with fifteen parts of filtered water. Allow this to boil gently over the fire for twenty minutes, and some minutes before withdrawing it from the fire add a third of the weight of the cochineal in cream of tartar that is very pure and very white. The color then takes on a yellow tone, and in this state you remove it from the fire and add to it, little by little, as much volatile alkali, which causes it to take on a beautiful crimson color, and then you allow it to rest. You have to pay careful attention that you do not put in too much volatile alkali, otherwise the color passes over to violet. When the color is well rested, you clarify it through a very fine sieve, add the aluminum according to whether you wish to have a lake that is more or less beautiful, and if you desire to have a color of great beauty, you precipitate with the tin solution, and add a very little aluminum. In all events, it is necessary to forbear adding too much aluminum, because then the lake becomes too pale. The residuum that it left in the wooden tub is boiled one more time, and one operates just as has been explained here before. But the lake obtained in this manner is very ordinary; in all cases, one is not obliged to be sparing of washes.

You can also precipitate this lake with tin salts that can be found at the druggists, in which case, the color assumes a carmine tone; but in the event that the precipitation is not entirely complete, you preserve the remaining liquor in order to precipitate it with aluminum and the tin solution. This lake happens to be very expensive and it is not itself employed in the