

Hello. My name is Richard Norman Thank you for taking an interest in this Book Arts E-book.

Other e-books and manuals on the subject of the Book Arts and Gilding are available for free download from the Eden Workshops website.

<http://www.edenworkshops.com>

If you are interested in gilding in particular please do check out our website at:

<http://www.gold-vault.com>

For nearly 20 years my wife Margaret & I ran a system of craft workshops devoted to the exploration of the Book Arts.

During that time we worked in almost total isolation and seclusion in the grounds of a very private monastery in rural England. We developed four book related skills; hand book binding, paper marbling and book edge marbling, printing & box making and took those skills to high levels of excellence.

In 1997 after nearly 20 years running the Eden Workshops we were voted a National Living Treasure by Country Life magazine for our contribution to the Book Arts.



In 2004 we decided to close our workshops and move out here to South West France, I now concern myself with mentoring those with aspirations to become bookbinders and have the time to concentrate on other aspects of the arts that interest me.

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Marbling -Tricks of the trade learned over 20 years

If you feel that you may suffer from the particular illness that causes people to pursue the Art of Marbling, then I hope that the material contained here may be of some use to you.

It was not so long ago that the secrets which underlined successful marbling were just that, secret. Now you may enter "marbling" as a search term in Google and come up with hundreds of pages, many of which give the authors own ideas and experiences, but it should be noted at the start, that everyone's situation is going to be different, the climate in which one lives, the variations in temperature and humidity, will all play a part in how your papers turn out. Perseverance will pay off, *I spent a long time just experimenting before I began to get decent results.* You it is to be hoped will benefit from these experiments and they may lead you to making short cuts to the desired result.

Right at the start let me explain that we will be talking about marbling with acrylic colours...why? Because I got fed up with the characteristics of ordinary gouache or artists water colour, when you rubbed the sheets, loose pigment would come off on your fingers, you had to treat the papers with beeswax in order to make the colours fast, and even then the colours would still come off on the customers hands when the book was handled extensively. With acrylic colours the result is not only a paper whose colours are absolutely fast, but the use of such colours makes the sheet damp proof, you can wipe them over with a damp cloth with no ill effect.

Marbling with acrylics differs from marbling with gouache or artists water colour pigments in several ways. With gouache or water colours, it is necessary to add a spreading agent to the colours to make them spread on the surface of the size...If you were to drop a small amount of gouache or water colour on the size without this spreading agent, the drop of colour would simply sink straight to the bottom of the tank, with a drop or two of spreading agent added instead of sinking, the spreading agent breaks the surface tension of the size allowing the colour to spread on the surface. The more spreading agent...the more the colour spreads and the less pigment there will be in a given area, and the paler the colour will appear, thus giving you control over how intense or pale your colours are.

In times gone by this spreading agent used to be ox-gall, I used to use it, and you can to, it can be bought, or if you are feeling heroic you can make your own. (However this involves going to your local slaughterhouse and asking for the gall bladders of cattle or calves (eek) having collected your galls in a plastic bucket, they then have to be burst and the flesh separated from the raw gall, next the gall needs to be de-fatted by straining through a column of rock salt, after which it is allowed to stand and when two distinct layers form (oil or fat on top) it is decanted and the fat or oil is discarded...this process is repeated until all the fat or oil has been removed....if that were not enough...the gall then has to be mixed with a strong alcohol, about 20%, so that the gall does not go off...It gets better (stronger) the older it gets.)

But....there is another way...and when I found out about it I never looked at ox-gall again!

The secret is.....Fairy Liquid! Yes, believe it or not good old Fairy Liquid, a household washing up detergent, will do the job just as well....*to get a working strength mix 20 parts of water with one of Fairy Liquid. I think any good quality household detergent will do.*

You must use a spreading agent with gouache or water colour pigment, but with acrylics things are a little different....acrylic colour has its own spreading agents embodied in the colours itself...some colours (white) spread on their own and need no spreading agent, while black needs quite a bit, critics of acrylic colours point to this anomaly and suggest that working with acrylics is difficult just because of this characteristic, I would say that if you are starting out it does not matter, you have to learn one system or the other, and the advantages of acrylics over gouache or water colours is distinct.

Experiment...try it and see.

I experienced quite a few problems obtaining good materials for marbling, carrageen moss is available in powdered form but I never used it, some marblers swear by it. The very best fresh moss I have found is available from Ireland, it's gathered from the beach, dried and then chopped, details of this contact are given at the end of this book. Also, Alum used to be available in small quantities from chemists but mine stopped supplying it years ago, an up to date contact for this essential ingredient can also be found at the end of the book together with links to other sites which may be of interest.

Here is a recipe for using powdered carrageenan moss.

Making the Carrageenan size with a blender.

The recipe calls for mixing 2 flat tablespoons of powdered carrageenan with 1 gallon of water. Begin by measuring out the amounts of carrageenan and water you'll need for your size tray. (A small 13-1/2 X 23 inch tray will use about a gallon of size.) Fill your blender about 2/3 full of water and add a little less than a tablespoon of size and blend for several seconds to dissolve the carrageenan.

Then add enough water to bring the blender to three-quarters full and blend another minute before pouring the mixture into a waiting bucket. Repeat until you've mixed all the size with the water.

Stir and then pour the mixture into your tray to fill it to a level of about 1-1/2 inches. If you let the size stand overnight, the bubbles introduced by blending will dissipate and your marbled image will be clearer.

If you have any specific problems or feel in need of one on one help, I offer myself as a mentor. See the link below.

http://www.edenworkshops.com/mentoring_in_the_book_arts.html

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I found that the acrylic colours manufactured by Windsor & Newton under the name "Galleria" are very suitable for use in marbling, they are quite economically priced, have plenty of pigment and opacity and are widely available in this country (UK) and abroad. You will need to dilute these colours for use; I found that an ideal consistency could be found by mixing the colours 5:1 with water.

Whilst on the subject of water it should be noted that the water used for mixing the colours and for preparing the size should be soft water...if you live in a hard water area, obtain water softener tablets from the supermarket and add 1 tablet for every 3 gallons of water or one tablespoon of water softener powder. Note: Do not use the salt used in dishwashers as a softener. If all else fails use rainwater.

One way to tell if you have hard water or soft, is to use soap. Take the soap and a little of your water and rub the soap into a lather, if the lather is rich and foamy your water is soft, if the lather is weak your water is hard. Water in most cities is hard.



I found it useful to keep an accurate record of colour recipes. In order to make repeat patterns you will need all the help you can get, and keeping accurate records of the colour you obtain is one step towards this. Any laboratory supply company can fit you up with all the plastic containers you will need, particularly useful are the calibrated measuring cylinders in the picture. Details of such a supply company can be found at the end of the book.



One critically important step in the process consists of sponging the paper that you use with Alum. This has the effect of making the paper "Mordant" or receptive to the colours, without it after marbling your sheets the colours will just slide off the sheet, which can be a little disheartening. I found after some experimentation, that 100g of Alum to a pint of water worked well.

Take care to add the Alum to cold water not hot, then slowly heat and stir the solution until all the Alum has dissolved. An ideal applicator I found to be the replaceable sponges of the type that are fitted to floor cleaners. I found a good way to treat the paper was to dip the sponge into the hot Alum solution and squeeze a little out, then wipe over the whole sheet of paper quickly making sure that the sheet gets saturated in the process, then I squeezed the sponge out and wiped away the surplus solution. Build up a pile of perhaps 20 sheets of paper, and turn them over, thus you will have face upwards the first sheet that you treated and the water will have soaked right through the paper, the sheet should be damp rather than wet. Taking care to remember which face of the paper has been applied with Alum, lay each sheet down and smooth it out flat, carry on until you have used up all the sheets. If you require more...then carry out this process a sufficient number of times.



Now we come to rendering down the carrageen moss. You can see the size of container I used for this, we lived in a hard water area, so I added one tablet of water softener to the container which held about five gallons, the water can be boiling when you add the moss, I used to bring the water to the boil and then go and treat a pile of paper with Alum and then come back when the water was boiling. I found that for three gallons of water one should add 8 ounces of carrageen, when the moss has been added, turn down the heat and simmer for half an hour stirring occasionally.

Measurements 1 UK gallon = 1.20 US gallons = 3.78 litres

1 ounce = 28.34grams



When the moss has been rendered down it has to be strained into a suitable container, obviously if you are marbling a lot of paper this has to be of some decent size, but for small quantities a bucket should suffice. Note: After straining the bucket of size, another bucket of soft water should be poured through the strained moss otherwise the size will be much too thick to use. The right consistency should be about that of single cream and a pale gold colour. If you follow the amounts of water and moss that I use you will automatically come to this correct thickness of size. Perhaps I should mention at this point that the smell of carrageen moss being rendered down is very much an acquired taste...dogs have been known to run from the room after smelling it! And one other point concerning the size, being organic it will go off quite quickly...a day or two in warm weather...then the smell will affect even the hardest of souls. One solution is to add a capful of Formaldehyde to the size, but be warned *this substance is very hazardous* and should be used with the utmost care....and never, never add Formaldehyde to warm size or the fumes will overpower you...always add to cold size, and even then wear a face mask...I never did like using it, but some people do because it allows the size to stay workable for several days longer.



The tank that you use to marble paper can be made of wood, stainless steel or plastic, in fact anything that is large enough and deep enough will do the job. The tank should be bigger than the sheet of paper you are using by about 2 inches all the way round.

Notice at the right end of the tank is a piece of metal set at an angle. After marbling your sheet of paper, a piece of card is drawn across the size to skim off the colours that remain, this card is then scraped up and over this metal and the waste colours fall into a reservoir. I am using dropper bottles to apply the colour to the size, but colours can also be thrown on with brushes. Using dropper bottles means that you can apply the colours in a disciplined way and it allows you to repeat certain patterns with comparative ease. All the plastic containers used are available from the laboratory supplies company listed at the end of the book.

Another essential part of the equipment consists of a range of combs, the principle is quite simple, for some of the simpler patterns you do not need combs, the colours are simply thrown on with a brush and not combed at all, however for many patterns combs are indispensable. The principle is quite simple, after the colours have been dropped onto the surface of the size; they are combed horizontally and then vertically until the desired pattern is arrived at. The first comb to be used needs to be able to draw the colours into horizontal bands, to do this you will need a comb which causes plenty of movement, see the combs at the bottom of the picture, they are made from 1/4 inch wooden dowel and are widely spaced, these are perfect for the first combing, and if a very fine pattern is desired, they can also be used for the second vertical comb. Thereafter, combs made from piano wire are used with varying spaces between the comb points.





Here you can see the first comb in action, see how this comb causes so much movement in the colours, and how the colours are being drawn out into bands.



The colours, having been combed vertically and horizontally with the thick dowel combs, are now being combed using the thin piano wire combs, these thin wire combs add the final touches to the pattern, there are many patterns that are possible using this technique.



Having manipulated the colours into the desired pattern, now comes the somewhat delicate task of laying down the sheet of paper to take the print. By now your pile of paper should have become thoroughly damp, damp not wet!

Making sure that you pick up the sheet in such a way that the face of the paper which has been sponged with Alum is facing downwards, take the sheet at each corner, notice that I am resting one hand on the corner of the tank, it allows me to keep the sheet steady and in one place as I slowly lower the rest of the sheet down onto the size.



Carry on lowering the sheet carefully until the whole sheet is laying on the surface of the size. The sheet is then lifted clear of the size and draped across a stick...a bamboo garden stick is fine for this...the size will then begin to drip of the edges of the sheet so this is best carried out on some sort of rack made for the job, water from a hose is then gently played over the sheet to remove the surplus size.

Note: Some marblers do not bother to wash of the surplus as they believe that the size as it dries gives the paper a little more strength. I have no strong feelings one way or the other on this point. The sheets

should be left at least overnight to dry, they can then be placed in a pile and pressed with a wooden board covering them with a brick or two placed on top.

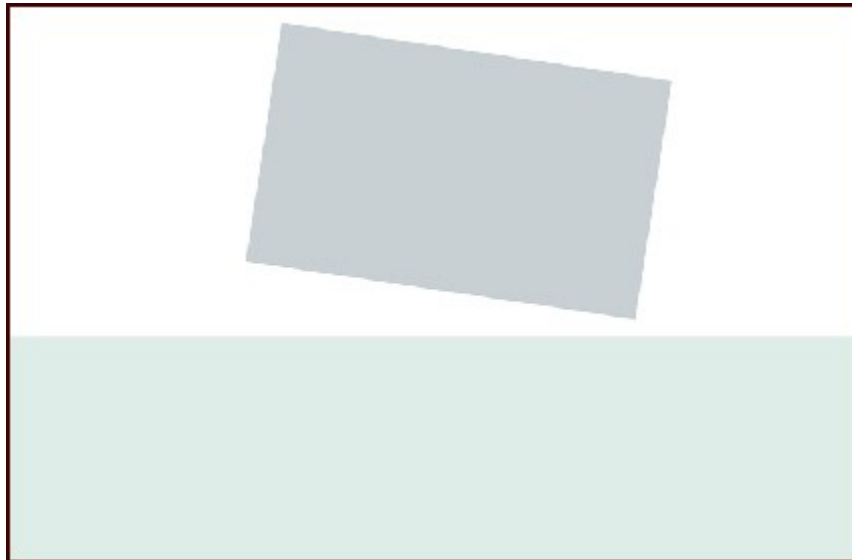


A lot of people wonder how this is done, actually it is quite simple, but care is needed as it is the last thing that is done to a book before sewing headbands and covering, a lot of work can be wasted if you ruin the edge at this stage.

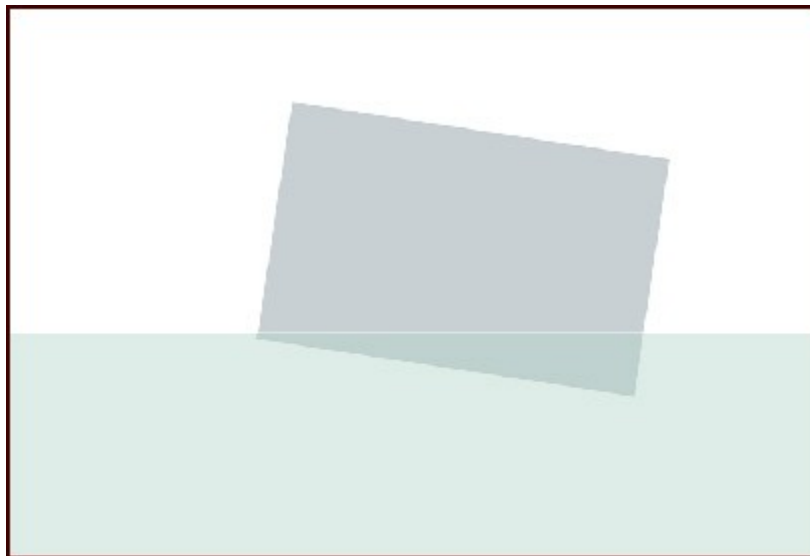


After the book has been sewn, cut boards that are exactly the same size as the text block, and clamp them in position as shown in the picture, I always do the front edge of the book first as it is the most difficult, the top and bottom edges are simple, after sponging the edges with Alum and letting the edges dry, each edge is dipped into the size, it is that simple.

Take care not to dip the edges too far into the size, really the edge should just kiss the surface and the pattern will be transferred to the edge. However the front edge presents a problem, usually the front edge is concave due to the action of rounding and backing, if you were to simply dip the front edge into the size an air bubble would form in the concave trough of the edge and the pattern would be ruined, causing you to have to let the book dry and then prepare the edges all over again...tedious!



To get around this problem the book, having been clamped, is held at an angle above the size as shown in the illustration above. Note: It is important that the book is firmly clamped for this operation.



The book is then gently lowered into the size, keeping the angle shown in the illustration, thus any bubble that forms will slide up the edge and dissipate at the top, just lower the book into the size sufficiently that the pattern covers the entire front of the edge.

As you can see, the bottom edge has to go down quite deep into the size, as much as an inch or more...so it is worth repeating that the boards should be clamped very firmly. The pattern will be transferred to part of the bottom edge, this can be simply wiped off, and when the bottom edge is marbled it will cover any marks left after doing the front edge. After marbling, leave the book(s) under a weight to dry thoroughly, the edges may then be given a light coating of beeswax and the edges burnished.

Our workshops were one of the last to regularly carry out book edge marbling and we obtained a lot of useful work from being able to do it. Practice in this case will make perfect.

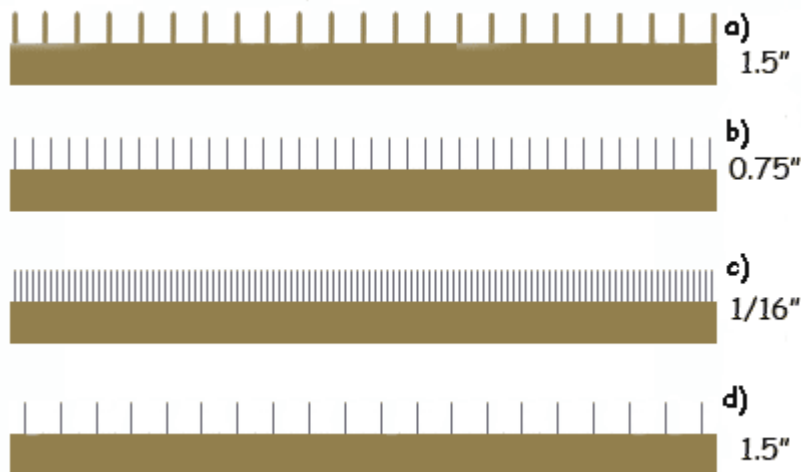


After marbling, the headbands can be sewn, boards laced on and you are then ready for covering!

The thing I really liked about edge marbling is that unlike gilt edges, which can be reasonably faked, a marbled edge can never be obtained by any other means than real skill, and the effect is much appreciated by customers.

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Most of the combs used to make the well known designs in marbling are very simple to make and the design straightforward to produce. Below and on following pages you will see examples of combs, particular designs and how they are obtained.

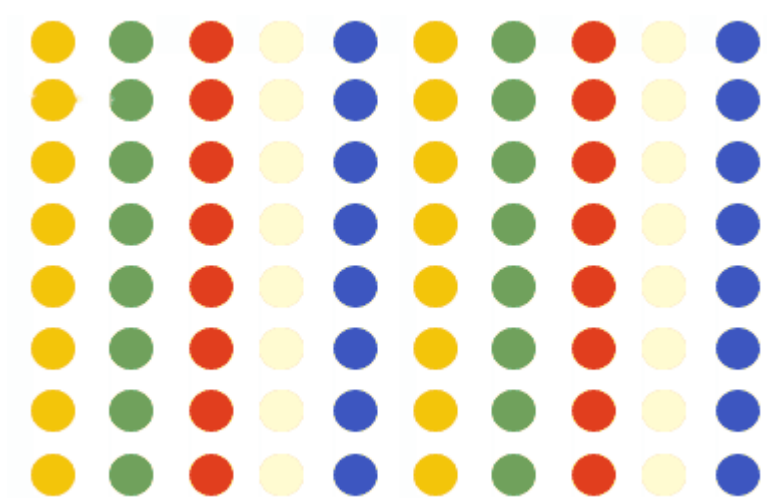


Here is a selection of combs that you would need if you intended to produce all of the designs shown here. Note that it would be advisable to have combs of each type shown which are as long as the bath you are using, and also a set which is as wide as the bath you are using, so two sets of combs of different lengths.

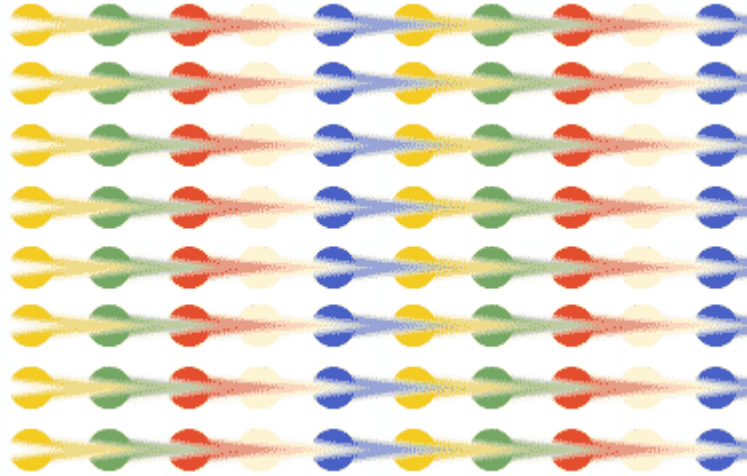
The top comb I made from a strip of wood and inserted 1/4 inch wooden dowels to form the pins. With most combed designs you will need to draw out the colours into bands and to do this you need a comb

which will cause a lot of movement in the size, when it comes to the finer points of the design you will use a finer comb.

To obtain many of the patterns you will need to apply the colours in quite a disciplined way, something like the diagram below for example, I used dropper bottles to drop on the colours, using them you can achieve a high degree of regularity in the placement of the colours.



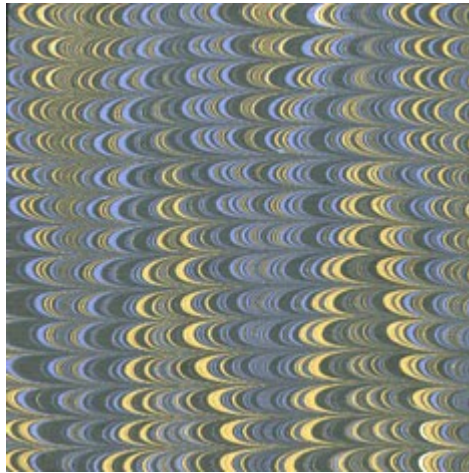
Here you can see me applying the drops of colour, in this case I applied a lot of yellow to act as a background colour, by the time all the other colours are dropped on much less yellow will be visible. Of course you can apply the colours across the tray or down its length it's up to you.



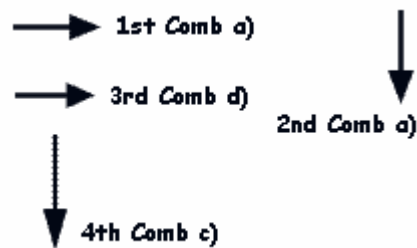
By using the comb with the thick wooden pins, the first time you comb through the colours you will achieve a lot of movement, what you are trying to do is draw out the colours into long bands, something like the above effect.



Here you can see me using this comb and also see how the colours are being drawn out into bands. There is nothing like experience as a teacher, experiment by drawing out the colours using different combinations of combs, the conditions in your area will affect how things work out, don't be frightened of having a go, make mistakes, it's all part of the learning process.



To obtain this pattern and others which are similar you need to follow the combing formula shown below. With all these patterns I am going to assume that you start by applying the colours using dropper bottles as shown previously.



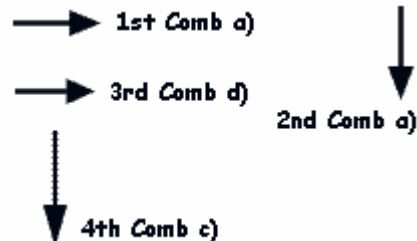
This pattern is a variation of the one above, to produce it, comb the colours out until you obtain the pattern above from the directions shown, then apply one more comb as shown in the picture below. Draw the comb through the colours in a snake like movement.



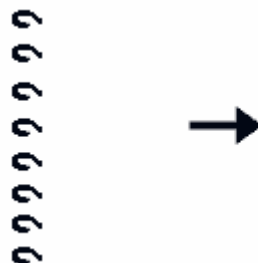
5th Comb d)



This is yet another variation on the original pattern we explored, this time construct the pattern as we originally did using the method shown below.



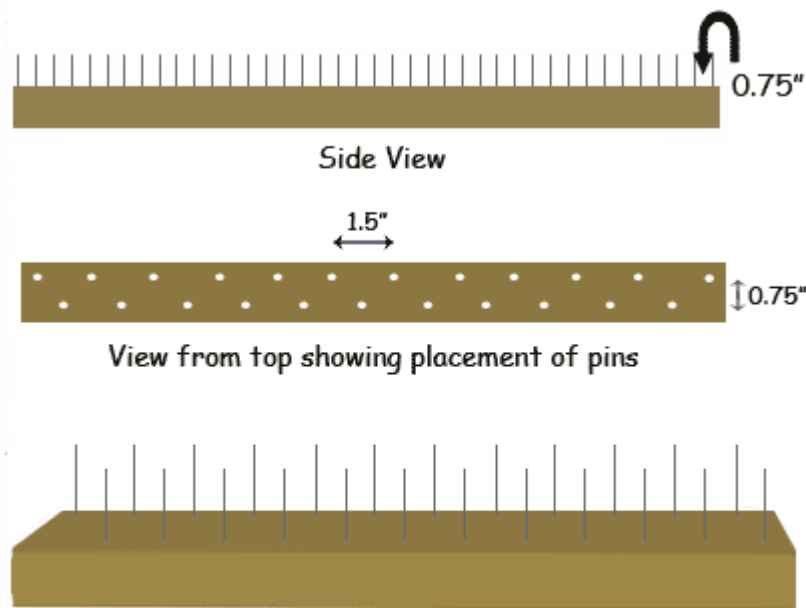
Lastly using comb d) starting at the top of the tray and at about 2 inch intervals, make a series of twists rather like the letter 6 as shown in the picture below.



Lastly we come to a very attractive design known by various names, such as "Peacock Curl" or "Peacock Fan". Depending on which direction you apply the final comb you will get one or other of the patterns shown below.



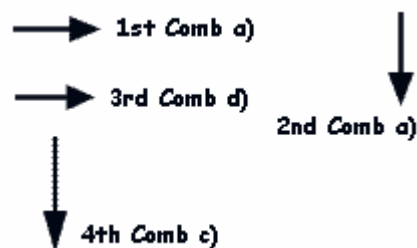
First let us see how to make the comb...



Above is an illustration of the comb we want to make, I used piano wire for the pins of all my combs with the exception of the one with thick wooden pins.

You want two rows of pins about .75" apart and 1.5" between each pin.

Obtain the original pattern using the method shown below.



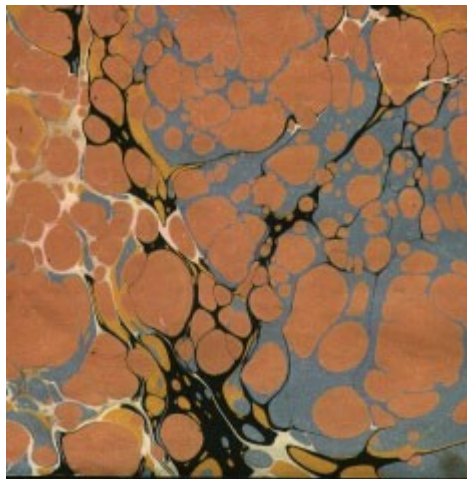
Then apply the comb shown above in a zigzag pattern down the length of the tray as shown below.





This lovely pattern is obtained by creating the peacock fan design and then taking your sheet of paper to be marbled, you hold one corner of the paper steady on the corner of the tray, and in contact with the size. Then with the other hand gently flap the sheet of paper as you lay it down onto the size, done correctly the design above will be obtained, but even the ones that don't work correctly will be interesting. The pattern is obtained by the peaks and troughs that form underneath the paper as it is being laid down, the peak of the wave is where the colours become stretched out and thin, the troughs are where the colours are forced together and you get a much denser colour, interesting isn't it.

There are many other patterns which can be obtained using the combs mentioned, just have fun and experiment, many of the simpler "stone" patterns do not need combs at all, the colours are just thrown on in an irregular manner and whatever pattern forms is what you get, something like the one shown below for example.



Trouble shooting!

I would be surprised if all went smoothly the first time you marble. More likely you will have failed to create all the conditions necessary for successful marbling.

Problem: The paint peels of the paper when it's dry.

For certain this problem is down to there not being enough alum on the paper; increase the strength of the solution.

If you let your paper dry before marbling, the alum will crystallise on the surface and the paint will peel off, don't let your papers dry out after applying the alum, the papers should be damp, but not wet.

When preparing the alum solution never let the water boil, or the alum will crystallise and fall out of solution, the water should be hand hot.

It's easy to forget which side of the paper you applied the alum to, make sure you are using the right side of the paper when marbling, paint applied to the wrong side will peel off.

Problem: The colour falls to the bottom of the marbling tray and does not sit on the surface and spread.

This happens when the paint is too thick, most acrylic paint needs diluting 5:1 with water, make sure you paint isn't too thick.

This also happens if there is not enough spreading agent in the paint, add a little more.

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Material Sources & Useful links

Finding sources of materials can be a problem, especially when it comes to finding good carrageen moss, I have tried powdered carrageen but I had no luck with it, by far the best moss is fresh of the beach

and dried. This moss can be obtained from the company below; they are prepared to ship worldwide and in small quantities (1 or 2 kg)

**Carabay Seaweed Health Products
Kylebroughlan
Moycullen
Galway, Ireland**

Tel: (From UK) 00353 91 773370

Email: graham@carabay.ie

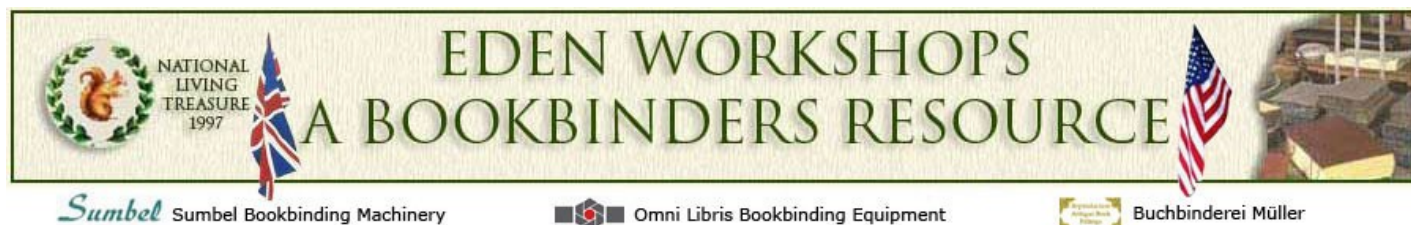
Alum is another item which I found hard to get hold of, it used to be available in chemists in 100g boxes, but chemists in my area (Bath/Bristol) stopped supplying it several years ago. It can be obtained by

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Green Sage Blue Maroon Red



Hazel Gold Tan Brown Black

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