

Gilder's Lament

My size is prepared,
The leaf is laid out,
My agate is polished and smooth.
The press, it is loaded,
The edge has been scraped,
I feel like I'm in the groove.
I put on the size,
I lay on the gold,
My confidence reaching its peak.
I polish the edge,
Till I see by its shine,
The edge of perfection I seek.
I take the book out,
Fan open the leaves,
My heart stops still in mid-beat.
Where has the gold gone,
I look all around.
As the leaf flakes onto my feet.
Oh, where did I err,
I did everything right,
But the gold, it just didn't stick.
I love the gilt edge,
But the process is such,
That it leaves me feeling quite sick.

Unknown Gilder ca 17thC

EDGE GILDING and EDGE COLORING of BOOKS

EDGE GILDING

Any process you wish to learn is something, which needs to be made "your own". You can read books, watch demonstrations and take lessons. In the end if you don't understand how your approach effects what you are trying to do, the results will never be what you seek. In this workshop you will see one way of edge gilding. The materials and techniques I use are an amalgam of those used by many binders. I would suggest that you combine what you see demonstrated here, with research of other binders and how they have produced gilt edges. Knowing as much as you can about a subject gives you the tools to fashion you own approach. From that gathering of knowledge, adopt a simple routine that is easy to repeat and has the least amount of variables. This will give you the best results.

MATERIALS

- A stout wooden press or a backing press
- Gilding boards
- Wood plane
- Talc (magnesium silicate hydroxide)
- Cabinet scrapers
- Metal file
- Sharpening stones
- Sandpaper (220 & 320 grit)
- Bole or Graphite (black lead)
- PVA
- Beeswax
- Japanese paper
- Gilder's tips, gilders' frame or strips of handmade paper
- Gilder's cushion
- Gilders' knife and honing steel
- Pumice
- Gold leaf (or other metal leaf)
- Cotton flannel or batting
- Several wide flat brushes
- Fine small brush
- Release paper
- Agates (flat and dogstooth)
- A stiff shoe brush (horsehair)
- Varnish Makers & Printers Naphtha
- Gouache, watercolor or acrylic

ORDER OF PROCESS

1. Trim book
2. Prepare gilding boards
3. Talc book edge
4. Load press and tighten
5. Apply bole and scrape
6. Sand edge
7. Apply bole and work in to surface with Japanese tissue
8. Apply bole and let dry
9. Brush burnish
10. Burnish 3 or 4 times w/agate
11. Apply first coat of size
12. Lay out, cut & pick up leaf on frame, tip or paper
13. Apply second coat of size
14. Apply third coat of size for soft papers
15. Apply slightly more generous coat of size and lay on leaf
16. First opportunity for repair
17. Push down leaf with flannel when edge becomes dull
18. Burnish through release paper
19. Direct burnish after edge is dry
20. Second opportunity for repair
21. Wax and do final burnish

TECHNIQUE – Preparation for placing the book into the gilding press

– Gilding concentrates considerable pressure solely on the edge of the text block, which could deform the text block. The edges can become thinner than the center of the block or the edge can become cockled. To avoid this, place the book in a press, for a few hours before gilding. When pressing the book, however, consider the effect prolonged pressure might have on the paper. The character of a soft paper could be changed and plate marks,

on prints, could be diminished. The gilding process will take only an hour or so, but during that time the pressure on the edge will be quite tight.

Edge gilding takes several forms – solid edge gilding being the most common. Gilding the edge of the unsewn sections is called “rough edge gilding”. This can give a very pleasing effect, as the edge has more facets to reflect the light. Gilding “in the rough” is done after the book is sewn and the paper still retains a deckle or is untrimmed. This kind of edge can’t be burnished, so the leaf will not be as lustrous as it might otherwise. Another option, with deckled edges, is to open the pages flat before sewing and lightly trim the deckle, removing only the larger protrusions of deckle and leaving some of the voids. The pages should be interleaved with plain paper, cut to the same size as the open text pages. The whole is then jogged, placed into the press and gilt. The plain paper will help support the deckled edges during the gilding process. The result is that only the taller areas of the edge are gilt and the lower ones remain plain. As with the rough edge gilding, the result can be more interesting than solid gilt edge.

Solid edge gilding may be done “in boards”, after the book has been rounded and backed with the boards laced on, or with boards just laid in to protect the shoulders. When gilding after the book has been backed, it can be difficult to get enough pressure across the spine of the book to adequately gild the very back edge of the spine. Before loading the book into the gilding press, try to push out some of the round. That will usually give enough pressure for gilding. If the paper proves to be too spongy or the spine not dense enough, it may be best to gild the book after it is rounded only. In this case, care needs to be taken when backing up the shoulders after gilding. A misdirected stroke, during backing can cause “starts” to appear in the gilt edge, which disrupts the smoothness of the leaf’s reflection.

If the boards are laced, the cords are pasted down only on the inside of the boards, not in the grooves on the outside. This allows for the boards to be moved, up and down on the book, parallel to the shoulder. For solid edge gilding, the book has to be trimmed with either a plow or guillotine. The guillotine blade must be free of nicks or your work will be greatly multiplied later, when scraping and sanding the edge. If the book is in boards, be aware that conventional binders’ board will damage the blade of a guillotine. If you are using a plow there are none of these issues. For top edge gilding, jog the book to the top allowing the boards to line up with the edge in so doing. For ease of handling you can wrap the book and boards, if any, around the middle, with a strip of strong paper and tape, to keep the boards aligned while placing into the press. It is important to keep the book edge and boards as flat and aligned as possible. This will eliminate a lot of work when trying to scrap the edge.

Before placing the book into the press for gilding, the edge needs to be dusted with talc. Talc (magnesium silicate hydroxide), also called French chalk, keeps the pages from sticking together during the gilding process. Do not use the talc manufactured for babies. It often contains silicone (which will hamper the gilding size) or may actually be cornstarch instead. Not all papers need to be talced, but it does no harm and is safer to use it if you are unsure about which papers need it. To apply the talc, hold the book vertically on its’ tail. Flex open the top edge to the right and dust in the talc with either a soft brush or your fingers. Flex the top edge to the left and repeat. Talc is a very fine particulate and care should be taken not to breathe it in while applying. Work in a well-ventilated room.

After the talc has been applied do not bang the book around very much or the talc will sift out of the book.

Gilding Boards – If your gilding boards are not prepared, this needs to be addressed. Gilding boards are usually made of beech, oak, maple or other straight grain wood. They are about 1 - 1.5 centimeters thick, along one long edge and taper down to about .5cm thick, along the other long edge. This tapered shape helps the press apply greater pressure to the bookedge. The boards are about 10cm wide and vary in length, depending upon how large the book, to be gilt, is. A couple of useful lengths to have are 20 cm and 30 cm. If the boards are much longer than needed, the extra length will become misshapen during the scraping and sanding, so choose boards just a bit longer than the edge you are working on. The thicker edge of the boards needs to be planed to an approximate angle of 70° in relation to the inside surface. This reduces the amount of wood you have to deal with, while scraping and sanding. A small hand plane will work fine for redressing the angle.

Note the direction of the wood grain and, on the inside surface of the board, pencil an arrow showing the direction. The grain direction is determined by observing the grain pattern on the face of the board. The direction, in which the wood grain is angling toward the edge of the board, is the grain direction of the wood. Plane the wood in this direction. Sometimes the grain is quite parallel to the edge of the board, in which case you may need to use trial and error to determine the direction. Place the wood, long, thick edge up, in the press and plane using a small block plane. If the plane is creating tiny voids in the wood then you are probably working it in the wrong direction. Work the plane in the other direction and note the difference. From time to time, use will require you to redress the edge and restore the angle.

The gilding boards should be laid on the book with the grain direction of the wood going in the direction in which the scraping and sanding will go. For top and bottom edge gilding this means the wood grain should run from the spine to the foreedge of the book. For foreedge gilding it won't matter. Try to have the grain direction of both boards going the same way when placed on the book. When you are ready to lay the gilding boards on the book, lightly moisten the inside of the boards, as you place them. Do this by licking your hand and swiping it onto the inside of the board or licking the board itself. The moisture will "grab" the book and hold the board to it. Take two gilding boards and something of equal thickness (possibly a third gilding board). Lay two boards on the bench and place the book on them so the bookedge and one board are even. The other board, or object, acts as a support to keep the book level. Place the third board on top of the book lined up to the edge. This will help keep the book and boards lined up while you lift the book and gilding boards into the press.

Open the press to the approximate distance, necessary to receive the book and gilding boards. Take the book and boards and carefully lower them into the press. If you can, place one hand underneath the book, to prevent it falling through the press. Lower until 1 cm, or less, of the book is above the cheeks of the press and tighten slightly. Check to see that the book edge, cover boards (if any) and gilding boards are accurately aligned. If not, you can lightly tap the cover boards and gilding boards with a backing hammer, while holding the book, to bring them into alignment. If much realigning is needed, it is best to remove the ensemble and begin again. When satisfied with the placement, tighten the press considerably. If the pages are not tightly held, they will flex during burnishing

causing the metal leaf to flake off. The press does not have to be tightened to the extreme, but the book will need a good stiff pressure.

Scraping and sanding – Provided the edge of the book has been carefully trimmed and all boards aligned, the next process is to scrape the edge. A cabinet scraper, like those used by woodworkers, is the best tool for this procedure. Its shape should be elliptical. Flat scrapers work the entire edge of the book, removing more paper and gilding board than necessary and can be difficult to control. With the scraper, you are merely trying to smooth the edge and remove anomalies, because your initial trim, with the guillotine or plow, created a flat edge. An elliptical scraper will allow you to work only the areas, which need it.

The scraper needs to be sharpened in a different manner than that of a knife. The working edge of the scraper needs to be at a 90° angle from the larger flat surface. It is not sharpened to an apex, like the edge of a knife. To do this, place the scraper in a vise and, using a metal file, work the edge to create the 90° angle. Turn the scraper around and work the edge from the other side. This will create a burr, which does the scraping, on both sides of the edge. When you have a burr, take the scraper out and hone the edge on a sharpening stone. From time to time lay either flat side of the scraper on the stone and work as well. Move from flat side – to edge – to other flat side repeatedly. Doing this refines the burr along both sides of the edge. The final step is to turn up the “cutting” edge of the scraper. To do this, hold the scraper in one hand. With the other hand take a smooth steel burnisher or the shank of a screwdriver and slide it along the edge while holding the burnisher at an angle of 90° to turn the burr up. Work the burr up on one side, turn the scraper around and do the same on the other side. Burnish again with the burnisher held at 85°. It is this burr that does the scraping. From time-to-time the scraper will need to be redressed with the burnisher. To do that lay the scraper on its side, hold the burnisher flat against it and run the burnisher over the burred edge. This will knock down the burr. Hold the scraper in your hand and redress the burr at an angle as before.

When scraping the edge, work from spine to foredge of the book. The folds at the back of the signatures could be chipped out if scraping toward the spine. Confine the scraping motions only toward the foredge. Hold the scraper with two hands, tilted away from you, at an angle of 45° to 70°. Working from the spine to the foredge, scrape the edge in light, short strokes. The scraper should be moving forward as it comes in contact with the edge so marks are not created by sudden contact with the edge. As you near the foredge, the stroke of the scraper should be lessened and pulled up, so as not to chip out any of the paper on the foredge. The whole edge may not need to be scraped; you are only trying to get rid of any areas, which are inconsistent and to smooth the surface. The edge need not be dead flat, like a mirror, but should not have any dips or raised areas, into which, the gilding size can pool or run off. An application of bole and gilding size (see below), before scraping, will make the edge damp, allowing easier scraping. The edge doesn't scrape well if overly damp so use caution. If the scraping is not going well, wait a minute to allow the bole to dry a bit and try again. Soft paper can suffer in the scraping if the paper is too damp. Use only enough bole and size to give the edge a thin coat. The removal of the bole, as you scrape, will also indicate where you have scraped. Once the edge has been scraped, lightly sand.

For sanding, use aluminum oxide sandpaper. It will not blacken the edge as some other fine graded papers can. Choose very fine grits like 220 and 320. Always use your fingers to hold the sandpaper, not a sanding block. The block is flat and will not conform to any undulations in the edge. This will cause a lot of undo sanding. The use of your fingers will also allow you to feel if the edge is getting too hot from the friction of sanding. Heat can cause the sizing (used to keep printing or writing inks from feathering) in some papers to fuse. Fused paper sizing will produce an edge that will not accept the gilding size. Starting with the 220 grit, sand in a straight line, parallel to the edge. Scratches will be caused if you move the sandpaper across the edge, or at angles to it. You will find these scratches difficult to remove and they may show in the finished edge. Hold the sandpaper between thumb and forefinger or both hands. Place the forefinger against the gilding boards to use as a guide. This will help to keep the sandpaper straight. When satisfied that you have an evenly sanded surface, graduate to 320 grit. Using a soft bristle shoe brush, brush off the edge from time to time while sanding and especially when changing grits. Any grit from a larger grit paper, left on the surface, can cause scratches when using a finer grit. At no point, during and after the scraping and sanding, should you touch the edge with your hands. Any oils or dirt, which get onto the edge, will affect the gilding size. Using the shoe brush, dust the edge free of any sanding residue.

Sizing - The choice of gilding sizes varies considerably. A solution of egg white and water or a thin solution of starch is the most common. Parchment size and gelatin size can also be used. Sizes are something, which become personal to the binder. Some people have better luck with one than another and it is wise to try a few different ones before settling on one.

To make the egg white solution, separate out, the white of an egg into an airtight container. Using one half of the eggshell, add 3 – 5 half shells of distilled water to the egg white and whisk together well. Let the mixture stand overnight and strain, through fine muslin or coffee filter, the following day. The solution will last, in the refrigerator for several days.

When using starch, most commercially available starches, corn, potato, laundry, etc. will work. You can also get starch from laboratory supply companies. One thing to be aware of is whether there is any silicone in the starch. Some companies add silicone to the starch to keep it from packing down during shipping and to make it pour easily, but it will make gilding very difficult. To prepare the starch, start with 175 ml of cold or room temperature distilled water. Pour off a small amount of the water into a saucepan and the rest into a teakettle. Mix a teaspoon of starch into the smaller quantity of water, in the saucepan, until it is thoroughly mixed. Bring the teakettle to a boil and mix that water into the saucepan. Place the saucepan on the heat and stir constantly, being careful not to let the mixture boil. That will cause the starch to thicken too much. Stir for a few minutes and take off the heat. If a skin forms strain the mixture through muslin or a coffee filter.

Parchment size is made by boiling small scraps of parchment or vellum in distilled water. Strain the liquid through a filter as with the other types of sizes. Add warm water, as necessary, to get the right consistency. Most sizes are very runny with just a slight degree of viscosity.

To make Gelatin size, mix one teaspoon into 150ml of boiling distilled water. Stir until completely dissolved and cool.

All of the aforementioned sizes need to be stored in the refrigerator. They will last only a short time. Any size you use must be kept covered so it is free from dust. When using it, decant off the amount needed. Do not put your brush into the larger amount, as that will contaminate the size. Whichever size you choose, refrain from making the size too thick. It will be more difficult to achieve a good burnishing. The thinner the size you can use, and still get the leaf to adhere, the better. The amounts given in these recipes are approximations.

The choice of sizing has something to do with the nature of the paper you are gilding. Egg white or starch work well on nicely sized writing or printing paper, and starch may also work on some of the less well-sized papers. Gelatin is better on the softer papers. Many fine printed books of today and those from the early 20th century are printed on "art paper" which tends to be soft and pulpy. Those papers can be more difficult to gild than the better-sized papers of earlier times. Some of the more common printing papers used today, may even be a bit easier to gild than art papers.

In gilding you are trying to create a glass-like surface on the edge of a clump of paper. To do this, there are two things to consider regarding the paper. First - the size needs to set upon the edge of the pages and not soak into the paper. You are trying to adhere the leaf to the very surface of the page edge. Any sizing, which goes into the paper, is not helping in that endeavor. Therefore the less sizing, inherent in the paper, the more the gilding size will sink into the paper and not hold the gold. Secondly - soft, pulpy paper is not rigid enough to stand up to the burnishing in later stages of gilding, causing the gold to flake off as you burnish. Add to this, the fact that soft pulpy paper soaks up a lot of size and you will see that gilding this type of paper is difficult. One way to address this problem is with the strength of the gilding size. A heavier size will make the gold stick better, but there is a tradeoff in that the burnishing will be dull or streaked. Satisfying the porosity of the paper, with a filler (covered below), helps to create an edge, which doesn't allow as much size to soak in. It is the combination of proper sanding, filler and size, which gives you the surface for gilding. The best papers to gild are handmade papers, which are sized in the vat. A weaker gilding size can be used and the burnishing will become quite brilliant whereas the soft papers will need a heavier size and the burnishing will be dull.

For several years I have been using PVA as a gilding size. I find it works better in some situations than the aforementioned sizes and certainly no worse. I use Jade 403 PVA, but any other PVA should work as well. To make the size, mix about a 1-teaspoon of PVA into 400 ml of distilled water and shake it vigorously. The solution is left overnight, and then poured into a clean container through a coffee filter to get out any dirt or large particles of glue. For particularly difficult papers the size can be made a bit thicker, but remember, that a thicker size will not burnish as well as a thinner one. The thicker size makes a more flexible, fluid surface for the leaf to lie on. Hard burnishing on such a surface may cause the leaf to move and be disrupted, but on some very soft papers that need to be gilt, you may have few choices. It may be better to get the leaf to stick and not worry about the burnish. PVA size has a very long shelf life as opposed to egg or starch size so it

is always ready for use. Using PVA size, like all of the other sizes, you still have to follow the steps methodically.

Filler – This is the base upon which the gilding size is laid. The filler accomplishes two things. It fills the pores of the paper and lends a background color to the gold. The act of filling the pores keeps the size from penetrating too far into the paper. This allows the size and the leaf to sit on the surface of the paper. Armenian bole (a reddish, finely ground clay) is most often used for this. Black lead (graphite, also called plumbago), gouache or any other finely ground material may also be used, separately or in combination. Sometimes a small amount of black lead is added to bole to give a richer deeper red.

Gold leaf is extremely thin – 1/225,000" thick. It is so thin that the thickness of the leaf is invisible without magnification. Even though leaf is highly reflective, an underlying color can influence the shade of the gold. The thicker leafs such as palladium, copper, and variegated may also be influenced by the underlying color but to a lesser degree.

Bole often is supplied in a cone, but also comes in powder. If you have a cone, use the edge of a knife to scrape some onto a small plate or shallow bowl. Using powdered bole, black lead or gouache, put a small amount onto a plate. Using a flat, soft-bristle brush, mix gilding size with the filler, until it is the consistency of milk. With the same brush, apply an even coat on the book edge. While the bole is still damp, take a crumpled and wadded up piece of Japanese paper and, using a circular motion, rub the filler into the edge, working from one end to the other. Do this until the edge appears dry and you achieve a slight polish on it. Using the shoe brush, brush the edge vigorously, from end to end. This will improve the polish. For very soft papers you may repeat this part of the process again. After rubbing the bole into the edge, apply a second, even coat, for color, and don't rub in.

Burnishing – Allow the edge to dry completely, then burnish by brushing the surface with shoe brush. After brush burnishing, polish the edge with an agate burnisher. This will consolidate the paper fibers, which were swollen by the liquid size. There are two types of burnishers, a flat burnisher and a dog's tooth. The dogstooth is an agate shaped like a canine tooth and bent to about 90°. The flat burnisher can either be perfectly flat or slightly convex. I prefer the convex burnisher, as it is less likely to dig into the book edge when using it. Both have wooden handles between 20 and 30 centimeters long and the agate (flat or dog's tooth) is fitted into a metal ferrule on the end of the handle. The agates need to be polished and very shiny in order to get a good burnish. As they are stone, it is advisable to keep them covered with a protective "sock" when not in use.

It is the flat burnisher we will use most. Before using a burnisher on the edge of a book it must be cleaned. Remember that any grease or dirt, which gets on to the edge can keep the gold from adhering. Some VM&P (Varnish Makers and Printers) Naphtha and a rag or paper towel will clean the burnisher nicely. As with the talc, when using VM&P Naphtha, use ventilation. Hold the flat burnisher in the right hand with the first two or three fingers around the front of the burnisher and thumb and other finger(s) in the back. Place the fingers of the left hand behind the agate with the thumb over the first fingers of the right hand. This will give you the greatest control over the burnisher. If you are using a job backer, or any press with metal jaws, tape some binders' board over the metal so the burnisher won't be ruined if you slip and hit the press. Approach the book from the side of the press and starting from the spine, gently and slowly, move the burnisher across the

edge from side to side until you get to the foredge. Do not burnish lengthwise as that can scratch the edge and in later stages remove the gold. Burnish completely from end to end three to five times.

Laying on the leaf – After the filler has been put on the book and thoroughly burnished, the edge needs several coats of plain size. With a flat, soft-bristle brush, apply a thin coat of size from spine to foredge starting in the center and working outward. It is best to use a brush, which when depressed upon the edge will spread out to cover the entire width. Any of the liquids, bole or plain size, are best applied in one continuous stroke. As this can be difficult, a small amount of back and forth may be needed. Keep in mind that when you apply a wet coat you are activating the underlying coats, which are already dried. It is possible to pull up some of the previous coatings by working back and forth. When putting down new coats try to be rapid, exact and cover completely. You will usually apply two or three coats of plain size before laying on the leaf. Two coats for better sized paper and three for softer ones. After you have put on the first coat, you will notice that the glistening character of the fresh coat will become dull fairly soon. It is after the coat has become completely dull that you apply the next coat. You can judge how the size is filling by the speed with which it becomes dull after each application. If the edge goes dull quite rapidly then you need more coats. You should, also, consider the humidity and temperature in your workshop. If the temperature is high and the humidity is low then the sizing will dry quite quickly even if the edge is well filled. The cooler or more humid your shop is, the slower it will dry. This too, can give a false sense that your edge is ready. It is only experience that will help you determine how many coats to put on. As stated before 2 or 3 coats will usually do it.

While the size is drying, the leaf can be prepared for laying on. For this you need a gilder's cushion, gilder's knife, pumice, leaf and a means to pick up the leaf. The cushion is a wooden board covered with vegetable-tanned leather, which is stretched over some padding. The padding can be anything; sheets of paper, felt, scrap leather or other material to build up and cushion the leather while giving a good firm surface. The cushion should be between about 5 mm thick. The leather is dampened and stretched over the board and cushion material with the reverse suede, or the flesh side of a skin, facing up. It is then tacked or stapled to the edge of the board and allowed to dry. The cushion is dusted with a small amount of pumice powder, which gets rid of any grease. Using the gilder's knife spread the powder over the entire surface of the cushion. The cushion is then held vertically, away from your work area, and the knife is used to slap excess powder off the cushion. Excess pumice might be transferred to the edge when gilding and ruin the result.

The gilder's knife is a blade about 25cm in length, sharpened along one edge and coming to a point at its tip. The backbone of the knife is usually thicker and flat giving the blade some strength. The knife is not sharpened as a knife would be for normal binding purposes. Where a typically sharp blade would ruin your gilder's cushion in no time, the gilder's knife works more like a saw. It is sharpened by dragging it across a sharpening steel at about a 70° angle. The knife needs to be kept free of grease. When the cushion is freshly pumiced, the sides of the knife can be wiped on the cushion to clean any grease off the blade. From this point forward, do not touch the cushion or the knife blade with your fingers. Any grease on these surfaces will interfere with cutting and handling the leaf.

Next, the leaf is cut to the correct size. Gold leaf comes in books of twenty-five leaves, with 20 books to a pack. Handling the leaf requires some practice and patience. The slightest breeze or sudden movement can cause the leaf to fly off the cushion and therefore be useless for gilding. Take a book of gold; lay it down on the left side of the cushion if you are right handed, or the reverse if you use your left hand. Open the first page by placing your forefinger on the paper leaf, in the upper fore-edge corner of the book, lightly pressing down and pulling the corner of the paper toward you. If your fingers are too dry, apply a very slight amount of moisture to your finger with your tongue. This will cause the paper to rise up so you can get your knife underneath it. Using only the knife, lay the page of the book open, exposing the first leaf of metal. Holding the knife flat, gently tap the cushion just in front of the fore-edge of the book until the leaf is folded over in half by the puffs of air. Slide the knife up to the folded edge of the leaf and gently blow the folded half of leaf over and onto the knife blade. The result is that your knife is now underneath the center of the leaf. Twist the knife a quarter turn and gently lift the knife and carry the gold to the other end of the cushion. As you lower the leaf, drag it and at the same time, rotate the knife underneath and away from the leaf. This will leave the leaf on the cushion, slightly ruffled and the knife free. Lean over the leaf, shape your lips to form the letter "P" and blow a gentle puff into the center of the leaf. The ruffled leaf will flatten out and is then ready to cut. You can lay out as many leaves as your cushion can hold. Don't lay out more than you will need for the gilding at hand, as the gold is easily disturbed. Follow the same procedure, but before you give the final puff to settle the next leaf, hold your knife between it and the preceding leaf like a fence. This will keep you breath from disturbing the leaf already laid out. To cut the leaf, rest the knife on its heel, poised over the leaf so that the length of the blade covers the leaf. Pivot the knife down, by its heel, onto the leaf and with a gentle back and forth "sawing" action, cut the leaf. Never pick the knife up from the leaf, but draw its full length across and off the leaf. If you pick the knife up it will carry the leaf and disturb it. If it is taking more than one back and forth motion to cut the leaf, or if the leaf is tearing instead of cutting, the knife needs to be honed again. Each time you hone, drag the flat of the knife across a section of the pumiced cushion, which has no leaf on it. When you have cut the leaf, place a small box (the top of a gold leaf box works well for this) over it so as not to disturb the leaf while you set up for laying it on.

There are several tools you can use to get the leaf from the cushion to the book edge. Gilder's frames, gilder's tips and even pieces of paper can be used for this purpose. The gilders' frame looks something like a wooden letter "U", the corners of which are squared not rounded. A second bar crosses from one upright to the other about 2.5cm above the bottom bar. The space between the uprights is around 12cm as is the distance from the upper crossbar to the top of the "U". Between the uprights is stretched a fine piece of thin silk organza which is glued along the uprights and the bottom bar. At the top of the "U" the edge of the organza, crossing from one upright to the other, is doubled over to present a firm straight edge. There is a removable piece of wood, which is placed between the uprights after the organza is put on. This keeps the organza taught. The frame is good for laying on full sheets of leaf and as such is more often used in production situations. The silk of the frame is dragged across the gilder's hair or face, to pick up a tiny amount of grease, and is then laid onto the leaf, leaving about 2-3mm of leaf projecting beyond the silk. The leaf can then be safely carried to the bookedge.

Another way to transfer the leaf is with a gilder's tip. The tip is made with hair from a squirrel's tail sandwiched between two pieces on thin card stock. They come as singles or

doubles. The double has more hair than the single and is used to pick up heavier metals such as silver and palladium. For gold leaf, the single is all that is necessary. If you were thinking of using other metals for gilding, the double would be the best choice as they are only a bit more expensive than the single and can be used for any type of leaf. The double is also easier to use. As with the gilder's frame, the hairs of the tip are dragged across the gilder's hair or face to pick up grease and then laid upon the leaf, leaving about 3 millimeters projecting beyond the tip, for sighting purposes. One thing to note when "greasing" the tools, is that in the wintertime there is more static in the air and rubbing the tool on your hair can charge the tool with static. The static will repel the gold or cause it to fly up to the tool as you are positioning it above the leaf for pick up. In this case the leaf will be misaligned on the tool and most likely wrinkled or torn. To avoid this, breathe upon the tool, after greasing, with an open mouth. The slight moisture will dissipate the charge and then you are ready to pick up the leaf. This is more important on the gilders' frame and tip than when using paper.

Another method for laying on is to use paper. Scrap handmade paper works well for this as it has a bit of tooth so the leaf is not held too closely to the sheet. Any stiff paper will actually work. Cut the paper to a size slightly wider than the leaf, maybe 12cm wide and 7-8 cm deep. It is greased in the same manner as above. The advantage of this method is the low cost. You are using scrap paper that may have no other use, and the paper is a bit easier to control than the tip. To lay on full sheets of leaf, the frame is still the best. As the frame is rigid and the tip has some body to it, those tools are positioned over the leaf and pressed down onto the cushion, leaving the 3mm of leaf projecting beyond the tool. That is sufficient to adhere the leaf to the tool. With paper you may need to gently rub the backside of the paper as it is in contact with the leaf in order to adhere it well enough. The paper is also better for gilding the foredge. The paper can be slightly curved to follow the curve of the foredge. The tip and the frame, being more rigid, require more skill to release the leaf in the arc necessary to follow the foredge curve.

Any of the tools for laying on need to be kept clean. A build up of grease can make the leaf difficult to release from the tool and thus tear it. The grease can also be transferred to the edge and mar the finish. With paper, you just throw it away when it is too greasy. If you do very little gilding, then just start with new pieces each time. The tip or frame need to be cleaned using VM&P Naphtha and a cotton ball. In a well-ventilated area, saturate the cotton ball with the naphtha and rub through the tip hairs or the frames silk while the tool is lying flat on clean paper. The naphtha is a good degreaser and will dry quickly. Whichever tool is chosen, there should be enough of them to load up the amount of leaf needed, for covering the edge. If three pieces of leaf are needed to cover the edge then three of the tools are needed. You can pick up each piece of leaf, one after the other, as you apply them, but if you are new to gilding, it is better to have the tools already loaded before laying on any of the leaf.

Use the shoe brush to vigorously shine the edge and then apply the final coat of sizing. This layer of size can be a bit thicker than the first coats but should not be too deeply pooled. Experience will help in judging the amount of size and how many coats are necessary. Keep the edge slightly moist through the entire gilding process. Don't allow the edge to completely dry out at any time from when you apply the first coat of size to when you lay on the leaf. If the edge dries out completely, the leaf may not adhere. When laying on the leaf, having a bit more size makes the job easier. You don't have to resize as

you go and wrinkles in the leaf will flatten out better, as the size dries. After applying the size pick up the first gilding tool and hold it over the edge as flat as possible and in very close proximity to the edge. The 3mm of leaf showing on the tool should be over the edge and onto the gilding board opposite of you so you can be sure the edge is completely covered with that piece of leaf. The tool is slowly lowered until the free edge of the leaf comes in contact with size. If the room is quiet, you can hear the "kiss" as the leaf releases from the tool. Pick up the next loaded tool and proceed in the same manner overlapping the previous leaf by 2 mm. Do this until the edge is covered. If the sizing is drying out before you get the next piece of leaf on, apply more, running it up to, but not onto the previous leaf. If you see any breaks at this time you can transfer appropriate size pieces of leaf to the missing areas. Breathe on the area with an open mouth to activate the size and lay on the repair.

Setting and Burnishing - Outside of getting the leaf on flat, this is probably the most important aspect of gilding. After the leaf is laid on, it will appear shinny where there is excess moisture underneath. When the shininess disappears it is time to set the edge. This is done with a soft, padded cloth. A piece of cotton flannel or cotton batting works well. Do not use cotton balls. The loose fibers can catch on the gilding boards or the book boards (if gilt in boards). These fibers can interfere with setting and burnishing the leaf. Using the cloth, lightly press down on the edge and pick it straight up. Do this across the entire edge, working from spine to foreedge, and repeat again. It is a good habit to draw the flannel across the palm of your hand in between pressings to remove any moisture that may be transmitted through the gold and on to the flannel. Do this three to four times gently increasing the pressure.

The next step is to burnish the edge through paper. After setting with the cotton, give the edge some time to dry before burnishing through paper. You want to burnish through the paper when the edge still has some residual moisture, but is not too damp. Depending upon the conditions in your shop, this can vary from immediately after laying on, to around fifteen minutes. To determine when to burnish, breathe on the edge with an open mouth. This will create a fog on the edge. The fog should disappear in about 3-5 seconds.

Dry mount release paper works the best for this procedure. This paper is coated with silicone and is hard and smooth. Baker's paper can also be used but only if it is very smooth. You can also use any common book paper if you wax the side, facing up, with beeswax. The important things to note is that the paper has to allow the burnisher to move smoothly across it and that any bumpiness, even the tooth of a laid paper or a watermark, can transfer to the edge. Take the paper, cut larger and wider than the edge, and lay it over the edge. Test the edge first by burnishing with the flat agate only a few passes. If there is no disruption to the edge then proceed. Start at one end of the edge and move the burnisher back and forth, across the edge, lightly and smoothly. Do this four or five times. During this initial setting with the burnisher, you can also move the burnisher lengthwise to the edge two to three times to insure a good adhesion. This will be the only time you can use the burnisher along the edge of the book. To do so without the protection of the paper would cause the edge to be scraped and the leaf to come off. All future burnishing is to be done across the edge.

Give the edge a little more time to dry, depending upon conditions about 30 minutes. Breathe on the edge again. The fog should disappear in about 1 second. If it takes longer you may need to wait a bit longer. Another method, sometimes used before burnishing, is to lightly tap the edge with the agate burnisher. If the edge is dry enough, it will give a faint "ping". There is a danger, however, that this method may dent the edge if hit too hard. The breath test is the safest.

When dry enough, very lightly burnish the bare edge, 2-3 times, with the agate. The number of times insures complete coverage with the burnisher. The next step is to wax the edge and burnish to luster. The wax is used to help the burnisher glide across the edge without damage so that pressure can be increased with the burnisher to deepen the luster. The method is to take a piece of beeswax in one hand and lightly stroke it with the thumb or fingers of the other hand and transfer the wax to the edge by lightly rubbing. Sometimes a soft cloth is used for this, which is fine, but the cloth should be discarded at the end of the day. Wax, which will harden on the cloth, can scratch the edge the next time the cloth is used. It is safer to use the hands, but be careful to apply the wax in very thin coats. Burnish the edge with a bit more force than previously used. Apply more wax and increase the pressure. If the burnisher is held at the correct angle, a considerable amount of pressure can be applied and a brilliant luster achieved. In all direct burnishing, it is best to hold the agate nearly perpendicular to the edge. This pushes the gold down as opposed to holding the agate at an angle and pushing the leaf ahead of the agate. Generally the edge is burnished 2-3 times, waxing in between each. Too much burnishing on soft papers can cause the gold to flake off.

A slightly different effect can be achieved without burnishing directly on the edge. You can get a soft, dull sheen by burnishing through the paper several times. In this case, you would not beeswax the edge.

When the edge is satisfactorily burnished, the book and gilding boards are removed from the press. Lay the boards and book on their side and hinge the top board away from the edge as opposed to lifting it straight up. Otherwise the gold on the edge might be damaged from the board coming away too roughly. Turn the book and remaining board over and do the same on the other side. You will find the pages are stuck together from the sizing and pressure. Holding the book flat and a few inches off the bench, slap the book against the bench. The resulting shock will loosen the pages. If all pages are not completely loosened, fan the edge in both directions.

Repairs – There will be times when repairs need to be made to the edge during the gilding process. There are two optimal times to do this. The first time is when you are laying on the leaf. If you notice a hole in the leaf, charge a piece of flannel with grease, as you do for laying on. Immediately pick up a small piece of leaf with the flannel. Breathe on the spot, with an open mouth to reactivate the size and press the leaf into place. Go ahead and set the edge and burnish through the release paper as you normally would. When it is dry, gently brush any excess leaf off the spot with the flannel. At this point you can treat the edge as you would normally, by direct burnishing, waxing and burnishing.

The other time for repairs is after the first direct burnishing. The repair is performed in the same manner as above. If the repair is unsuccessful, take a very fine brush and apply a small amount of sizing on the area of loss. Immediately place the repair leaf on top of the area

and push down quite hard. This will set the repair and you should be able to go on with the rest of the process without waiting. The key consideration with repairs is to keep them from showing in the finished edge. Repairs made at these times are less likely to show up. Also, any extra leaf, which can be brushed away will further a good result.

A word about cleanliness. The PVA size is susceptible to small particles forming in the solution during storage. It would be best to strain the solution each time it is taken out for use. All brushes and containers should be kept clean. A beautiful edge can be marred by the smallest of particles underneath the leaf.

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EDGE COLORING

Colored Edges - A simpler, but no less beautiful method for edge decoration is the use of color. Colored edges allow for more variation than gilt edges. Edges can be colored solid, mottled and sprinkled and more than one color can be used. For a solid edge, the best results are achieved if the edge is prepared in the same manner, in which it is for gilding. Carefully trim the book, talc and place it in the press. Scrape and sand the edge as with gilding. If the edge needs to be dampened for scraping, use plain size.

Gouache, watercolor, ink or acrylic paint can be used to color the edge. The paint should be thinned with gilding size, to a consistency of cream. Some of the older books suggest the addition of sweet oil, such as olive oil, added to the mixture, to make burnishing easier. Using a sponge or brush, apply a thin, consistent layer of color, working from spine to fore-edge. When the edge is dry, apply another layer. In most cases this should be enough to make the edge solid. If the color doesn't go on in a smooth consistent manner, the press may need to be loosened. This will allow for better penetration. Usually, however, this does not need to be done. Using the shoe brush, polish the edge as you would after applying bole for gilding. Apply beeswax and burnish with an agate.

Sprinkling - For sprinkling, prepare the edge as with the solid colored edge by scraping and sanding. Take the book from the press and lay it on the edge of a bench with binders' board on top and bottom, to protect the front and back of the book. A weight is placed on top of the book (or books) and the color is prepared as if for a solid colored edge, the color being just a bit thinner, and poured out into a shallow dish. A piece of hardware cloth (heavy screen with 1/4" - 1/2" mesh) is stretched and stapled, across a small wooden frame (about 25cm x 25cm) to give it enough rigidity to allow the screen to be held in one hand. With the other hand dip the shoe brush into the dish to charge with color. On some waste paper, flick excess color off the brush and onto the waste paper by rubbing the brush across the screen until you achieve a layer of fine spray. Once you have regulated the quality of the droplets, turn toward the book edge and splatter. As you will see from the waste paper, the first several times you rub the brush across the screen, the droplets are large and varied. Once some of the excess color is off the brush and screen, the droplets

become finer and more uniform. Another thing to look out for is a build up, on the screen, of foam from the brush rubbing across the screen. Be aware of this and bang the screen frame on the waste paper to remove the foam if it occurs.

Alternately, you can use a glue brush and iron press pin or heavy pipe to splatter the edge. The brush is charged with the color and then hit upon the iron pin causing the color to be flung off the brush in droplets. Regulate the size of the droplets using waste paper.

Several different colors can be applied to an edge to give variation. As with the solid colored edge, burnishing the edge will give a nice sheen and the beeswax will protect the color. After any of these treatments, place the book in the press and burnish as with the gilt edge.

Other things to try are to sprinkle rice, small seeds, sand or other small consistent sized objects on the edge before sprinkling. Do this on the white edge or after one color has been put on. You can even do this several times to build up a complex layering of color. Melted wax can be dripped or splashed on the edge before coloring or after an initial color has been laid on. The wax can be used in sprinkling or solid colored edges. After the color is dry, knock the face of the book on the bench to loosen and break off the wax. Return the book to the press and burnish.

Another striking method, for decorating the edge, is with flakes of leaf. Place the book into the press, scrap and sand the edge as with gilding. Color the edge as a background to the flakes. When dry, brush burnish the edge. Apply a layer of plain size. Using a tea strainer and a toothbrush, put some leaf in the strainer and brush the leaf through so it falls on the wet size. When the size is dry, burnish through paper, then wax and burnish with an agate. Use several types of leaf, palladium and gold, variegated, etc. and experiment with screens having different size mesh. The smaller the mesh, the smaller the leaf flakes.

Many of these methods can be used in combination. You can do a solid gilt edge and sprinkle it with gold of a different alloy giving a subtle effect or even palladium creating silver flecks on the gold edge. Colored edges can be built up by sprinkling numerous different colors or shades of the same color. Each edge can be treated differently. The instructions given here should allow you to get the basics down so you can expand your own vocabulary of methods.

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