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TO INVESTIGATE MATERIALS  
AND THE LIFECYCLE OF THE DRAGONFLY

Degree Programme in Fine Art  
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## THE PURPOSE OF THIS THESIS WAS TO INVESTIGATE MATERIALS AND THE LIFECYCLE OF THE DRAGONFLY

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The purpose of this thesis was to investigate materials and the lifecycle of the dragonfly.

The purpose of this study was to investigate the Lifecycle of a Dragonfly. The idea was to demonstrate the three stages of the Dragonfly's life, the egg, the nymph and lastly the dragonfly.

The script Cnut was analysed and studied, and a practice book produced. Versals were also analysed and studied, and a practice book produced. The colour systems were investigated in colour swatches, these were red, blue and yellow, cyan, yellow, magenta and black, and two red, two blues and two yellows. Different types of Vellum were also investigated and discussed. Different types of Gilding glues were also investigated on paper and vellum. These materials were investigated to be used in the pieces of calligraphy.

A Vellum piece was produced and three pieces illustrating the Lifecycle of the Dragonfly were produced.

It was concluded that the two blues, two reds and two yellow colour system was the best one to use for calligraphy as it produced the widest range of colours, also in the use of painting other colours could be supplemented easily in the illustrate the Lifecycle of the Dragonfly. The result of the Gilding experiments was that Gesso and Gums were suited for Vellum and Paper use. Reindeer Vellum was found to be the most suitable for use with Calligraphy.

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# 1 INTRODUCTION

So my thesis is about investigating materials and using them in the subject of the lifecycle of the dragonfly. The materials investigated were the colour systems, red, blue, yellow and cyan, yellow, magenta, black and two reds, two blues and two yellows. I will also investigate different types of vellums and gilding glues on both paper and vellum. The subject of the lifecycle of the dragonfly was chosen because I was interested by the ways in which I could illustrate this subject using calligraphy with the material research. In the research for materials I decided I wanted to re read the knowledge I knew but also go outside these boundaries. This is particularly true for the colour research which I had a basic knowledge from college work already but wanted to improve upon this. I want to create three pieces of calligraphy using these materials and the hands cnut, versals and roman capitals. The three pieces would illustrate the three stages of the dragonfly's life which would be the egg, the nymph and the adult dragonfly. Dragonflies are beautiful and interesting subjects. The colours of them are endless and I decided this would be an interesting subject to research with colour theory which is such an important part of calligraphy. I also want to produce one piece on vellum which would be more of a scientific view on dragonflies.

## 2 THE DRAGONFLY LIFECYCLE

### 2.1 Introduction

So the reason I chose this subject of Dragonflies is because I find them quite amazing and unique. Dragonflies are from the order Odonata and the suborder of Anisoptera. They have many characteristics like multifaceted large eyes. Their bodies are elongated with four transparent, strong wings. They are agile flyers with shining coloured markings with beautiful iridescent wings. This particular detail caught my interest immediately when looking through information on them. That I could have a real play with the colour of the lettering and I hope my swatches and work show this.

Dragonflies are found in most continents except Antarctica. They are most common in rain forests of the following countries; Malay Peninsula, Singapore, Sumatra and Borneo. They can be traced back over three hundred million years ago, back to the dinosaur age when they were much larger animals. There are over five thousand different species today with four hundred and fifty living in the United States of America.

So I investigated what sort of area to study for my project and decided upon the lifecycle of the dragonfly. The lifespan of a dragonfly varies upon the type but generally lasts between one and three years. There are three stages; the egg, the nymph and the adult dragonfly.

## 2.2 The Egg

So to get to the first stage a male and female dragonfly must first meet. The male when ready will usually fly about marking off its territory and warning off rival male dragonflies. He will find a female during flight, he then attaches himself to her by grabbing her head with his legs. They mate during flight if all parties are willing. Shortly afterwards the female is ready to lay her eggs. The female dragonfly can produce up to one thousand, five hundred eggs. The female dragonfly will lay her eggs generally on plants in water or sometimes just drop them in to the water if she cannot find suitable plants. Different types of dragonflies will lay the eggs in different places. The eggs will hatch between two and five weeks later in to larvae. These larvae or nymphs will live in water, some prefer an acidic boggy pools while others prefer a large clean pond.

## 2.3 The Nymph

The dragonflies are usually in this stage as nymphs for between three and five years depending on size. So most of a dragonfly's life is spent as a nymph. The nymphs are generally hard to find as they are under water and do not come out during the day. The nymphs can be affected by a water mite which can cause death, it affects the gut and can cause an infection. They are camouflaged and dark brown in colour. They look like some creatures from out of space. They have no wings and a crusty lump

hanging on their backs. The nymphs or sometimes known as Naiads are very good predators and can eat food equal to its own weight in a short period of time. They have an unusual structure to eat with which is called a mask. This mask is a long hinged lower lip which can be extended at speed to obtain prey using two hooks. They are carnivorous, so eat mosquitoes, other larvae, aquatic insects and worms to name a few. These nymphs' will molt their skins between eight and seventeen times during this stage of their life. The first stage of a nymph's life is called Prolava, in this stage they are not very active. Then during the nymphal stage it will become more active and hunt and swim. It has the same body structure as an adult dragonfly except there are no reproductive organs or wings. The nymphs have a strange respiratory system, they breathe through their anus underwater. This cavity is quite large and has special folds for the exchange of gases. To inhale the nymph will pump water into the chamber and exhale by pushing the water out. This system has a definite advantage as when the nymph is threatened by a predator it can pull its legs against its body and push the water out quickly out of its anus and move quickly forward away from the enemy.

So when the nymph is ready to transform in to an adult dragonfly it will instinctively crawl out of the water and up the stem of a plant. If the nymph stage is completed at the start of wintertime it will stay in the water until it is warm enough. The nymph will shed its skin on to a stem of a plant, this skin is called the exuvia. This is called the metamorphosis stage, the nymph will stop eating and its respiratory organs will take in air for the first time.

#### 2.4 The Dragonfly

Once the nymph has shed its skin and now is a newly formed adult dragonfly it will have to wait a few hours after emerging for its wings to dry out. During this stage the adult dragonfly is exposed to predators, but also strong winds and ships as would be near water. This is called the 'teneral' stage. This word is latin, which means soft or delicate or tender. Once the adult dragonfly is flying it is an agile predator. It will eat a whole variety of insects like gnats, flies and mosquitoes, managing to keep the population down on pests like these. The adult dragonfly will also eat bees, and bee keepers consider the dragonfly to be a pest. Adult dragonflies must also be careful of

predators themselves particularly of birds, lizards, frogs and fish. Dragonflies are excellent fliers, they can fly up to forty five miles per hour and at all directions. For example backwards, straight up, down and either side. Their wings flap up to thirty times a minute. The adult dragonflies live only for approximately two months, so you could say they live for the moment.

It is also important to note that adult dragonflies are harmless creatures, they do not sting or bite. They have no teeth, the family name Odonata comes from the Greek word for tooth. But they do not, instead they have a strong mandible that will crush the prey. If someone picks up an adult dragonfly there may be a chance of it biting if the mandible is near the skin in self defence. Species which are rare or large might be able to do this but none are poisonous. Adult dragonflies are curious creatures and sometimes give the wrong impression when flying around. So once the adult dragonfly is flying the circle starts again by seeking out a mate, producing eggs, then the nymph and finally back to the adult dragonfly.

### 3 CNUT

#### 3.1 History

I have always wanted to study Cnut as I wanted to study the pen manipulation as it is completely different to anything I have done before. While studying Cnut through my one hundred day practice book I was able to also go to a workshop led by Christopher Haanes, a Norwegian Calligrapher who has developed this in his own work and is very well known for it. It was a two-day workshop in London and we generally studied the technique of pen manipulation with the italic hand but he did show us ways to use it with other hands like rustic and foundation for example. So through learning Cnut hand and using pen manipulation I can develop it further and use it with other hands.

So the manuscript I chose to study was called the Arundel Psalter, MS 155 which is held at the British Library in London. The manuscript is a Psalter and Prayer book in

Latin. The page sizes are eleven and three quarters times eight and one quarter inches or two hundred and ninety seven times two hundred and ten millimeters, it contains one hundred and ninety three folios. It was written by Eadvius Basan who was a scribe of Christ Church Canterbury between A.D. 1012 and 1023. It has been discovered that there are ten other manuscripts which Eadvius Basan wrote which would include Eadvi Codex in Hanover, a Gospel, the Cnut charter of 1018, also some pages of the Harley Psalter and the Verspascion Psalter.

In this manuscript the beginnings of gothic compression can be seen, there is a rhythmic movement with firm structure with lightness of weight. This script is very similar to another manuscript I looked at which was the Benedictional of Aethelwold which I also studied. The serifs are wedge shaped with a linked r and a, an up right form of the t when ligatured with the r and t. The headings are in rustic capitals with large Versal initials on each three lines high.

### 3.2 Canute the Great 1016 - 1035

I thought I should say a little bit about the history of the era. So therefore the son of Seveyn Canute became the undisputed king of England in 1016. The rivals, Ethelred's surviving sons and Edmund's son fled abroad Canute the Great married Ethelreda's widow Emma, the Church of the time did not recognize her as his wife. During his reign Canute also became the king of Denmark and Norway. Canute used English and Danish Earls to assist in the English Government during his absences in Scandinavia. He was a second generation Christian for reasons of politics as well as faith. Between 1027 - 8 Canute went on a pilgrimage to Rome. He was buried in Westminster and his empire failed to survive after his death.

### 3.3 Analysis of Cnut

So when looking at the manuscript the writing to me is the main event, it is not a lavishly decorated manuscript. So I feel the main thing about the script that makes it stand out and look interesting to me is the pen manipulation. So at the start of most of the letters the pen angle is between twenty five degrees to thirty degrees. Then the pen angle is made steeper during the stroke and develops a waist, especially on the



down straight strokes, it then gets flatter towards the end of the stroke. This manuscript was no doubt written with a quill and this would be easier using a quill compared to a metal nib which I used. Also when creating a waisted stroke you could of course use pressure as well as the pen manipulation, this is what I generally did when writing Cnut. When looking at the starting point of the strokes of some of the letters you can see that pressure was used as well as the pen manipulation. Most of the descenders and ascenders are usually three nib widths in this script but some of the letters do go to four, for example the P's and a large A which I found in the manuscript. The tail of the F for example was two nib widths as was the L's and the X's. I found the x height to be five nib widths, the same as italic. When writing out this script I would think in my head that I would write it like italic but it would look like foundational. Both of these scripts I really enjoy and found it very enjoyable using elements of both when doing the practice book. The widths of the letters varied slightly sometimes between two and three nib widths. I found the O was three nib widths but letters like the E and A to be two and a half. The N and the M's were two nib widths as was generally the spacing between each of the letters. The nib widths between the words was between three and three and a half. The interlinear spacing was between seven and nine nib widths. The serifs consisted of club serifs to start with on the first stroke then became tick serifs on the outgoing strokes. The outgoing strokes for example on the M's, N's and U's were slightly flattened. The club serifs were probably done with pressure first and then some pen manipulation took place. There was a letter slope on this script like italic which is five degrees, in this manuscript it was between fifteen and ten degrees, sometimes not even a forward lean but sometimes a backwards lean, for example I found an F that was leaning backwards. So in some respects similar to italic, I think it is the way you interpret this script to make it your own which I have done. I have also seen some italic versions of Cnut but wanted a cross between the two. This shows when carrying out the arches, so I wanted an arch like foundation but done like italic so slightly branching up as done in italic and so continuing the stroke and not lifting off as in foundation. Some of the serifs when analysing the script could have a double stroke or could of been done with pressure. Some letters were joined in the manuscript like the R and the I, also the T and I were also joined as a stroke. When there was a word which began with an F and a L, the cross bar of the F was joined to the L, also in some instances the crossbar of the T would also be joined to the next letter like a Q

for example. Although I did branch the arches to look like foundation, the script could of been done with a lift of the pen like in foundation. So the letter of B, D H and L all have the similar starting stroke of a heavy club serif, they also have good corresponding characteristics. There were several versions of the F, some with a cross bar, some without, but there were also some joined double F's in the manuscript. The E had a slight extender on the flat line after the curve occasionally. The O was very round like foundation and you can see this throughout the letter shapes. There is also a cross bar on some of the descenders of the P. I found most of the letters had only one version apart from those mentioned.

#### 3.4 The Manuscript, Benedictional of Aethelwold

The Benedictional of Aethelwold dates to the 10th century England. It is highly decorated manuscript and is lucky to have survived Anglo Saxon England, it surpassed the Lindisfarne Gospels, (Knight, 1984, E3). So that is where it differs to the Arundel Psalter in decoration. The Benedictional contains twenty eight full page miniatures. There are nineteen pages of text which are surrounded by elaborated decorated frames and had has two historical initials. This is an important document which although similar to the Arundel Psalter is highly decorated.

The actual manuscript is written on vellum. The size is two hundred and ninety two times two hundred and twenty five millimeters with the text space two hundred and ten times one hundred and forty millimeters. There are a lot of leaves in this manuscript. It has a dry point ruling with double vertical guide lines twelve millimeters a part. The boundary lines of the text are re-enforced by pencil lines. This manuscript is written using Caroline Miniscules and Rustic Capitals, or Square capitals or uncial depending upon the importance of the occasion. In the headings of the benedictions small uncial characters are used except for the heading of the first benediction which are in gold square capitals with a historical initial. For the text initials and Amens small red uncials are used except for the Benediction of Aetheldreda the Amens are in gold. There are twenty eight full pages all except the last with either rectangular or arched decorative frames. There are twenty pages of decorative frames either rectangular or arched.

## 4 VERSALS

### 4.1 The Manuscript, Second Bible of Charles the Bald

I decided to study Versals as well as I have always admired them very much. The manuscript I chose reminded me of Roman capitals. I particularly liked the size and proportions of the letters. The manuscript is called the Second Bible of Charles the Bald, MS LAT 2, this is held at the Bibliotheque Nationale. The size of each page is seventeen inches times thirteen and one quarter inches. It has four hundred and forty four folios and the actual size of the Versals are two inches. It was written in the south of Paris at the Abbey of St Amand between AD 871 and 877. This second Bible of Charles the Bald does not have a great deal of figurative decoration unlike the first Bible of Charles the Bald and the Grandual Bible. These two manuscripts are both from the Abbey of St Martin, Tours. The first Bible of Charles the Bald is a product of the Franco Saxon School which is known for its classical simplicity of beautiful monumental capitals within its restrained use of interlacing (Knight, 1984, E2). There are books with this Bible and each has a decorative opening. The first Book of Kings, the Palms and the Epistle to the Romans has a huge page of capitals. The New Testament (Matthew) and the Old Testament (Genesis) opens with a double page spread of lovely large capitals. The titles can be found on the left and the start of the words on the right. On the New Testament the opening capitals are alone without decoration borders. These capitals were gilded then outlined using a quill in vermillion. They relate very well to classical Roman inscriptions which is probably why I like them so much. The scribe probably related the Versals to these inscriptions seen at first hand. The scribe related weight and serifs to calligraphy. There are plenty of capitals on other pages which are small and heavier with restricted space.

### 4.3 Analysis of the Second Bible of Charles the Bald

I chose the Second Bible of Charles the Bald, MS LAT 2 for the Versals analysis and practice because the construction is so like Roman Capitals. But they appear more grander, with elegant stems and the size and structure of them indicates this. So this manuscript was undoubtedly written with a quill, I wrote this script with both a quill and a metal nib. I generally prefer using a metal nib but wanted to try with both.

When looking at this script I see beautiful thin serifs particularly on the letter A, with a fine serif on the top, there were two versions of this letter, one being the classic A shape. The B, C and D there were only one version of each, lovely linear structures. The letter E did not always have a straight back in the manuscript but sometimes it was round, like the O. The G was slightly different in some circumstances with a curly crossbar or sometimes it was a classic G. I really liked the classic shapes of this script and it was a very slow script to write, construction consisted of three strokes, with a slight waist.

## 5 COLOUR SWATCHES

### 5.1 Introduction

So when deciding on the subject of the life cycle of the dragonflies I thought that colour would be ideal to investigate with this subject. The colours of the dragonflies wings are enhanced by a microscopic ribbed structure of individual scales on the wings. The colours are scattered and vary depending upon the angle of reflection.

So I started looking at what colour systems' artists' use. I enrolled for a ten week water colour painting course to learn about the colours painters use, after all I think they are the experts in this subject. The tutor Karen Rice used the two reds, two blues and two yellows system and also added a few other colours like the earth ones. The other systems I looked at were red, blue and yellow and also cyan, yellow, magenta and black otherwise known as CYMK. I carried out colour swatches for all three

systems in water colour and gouache in my studies.

## 5.2 Two Reds, two blues and two yellows

So the two red, two blues and the two yellow system is commonly used by painters. They produce a wide range of secondary colours but dark colours are a bit of a problem particularly if these are used in printing as black would have to be added. But in painting earth colours would be used like burnt umber or burnt sienna. These colours are useful for all subjects and will enliven the piece of work whereas black will make it look flat and deaden the piece. So creating smokey darks without using any black. So when choosing your two reds you would choose a warm red which has an orange bias like Cadmium red and a cool red with a purple bias like alizarin crimson. For the two blues you would choose a warm blue which had a purple bias like ultramarine blue and a cool blue with a green bias like cerulean blue. For the two yellows a warm yellow with a bias to orange like cadmium yellow and a cool more muted yellow with a green bias like lemon yellow. So these are important notes to remember to obtain the most variety of colours when mixing for secondary and tertiary colours. The secondary colours would lean towards a colour bias depending on the colours mixed. The tertiary colours will tend to be more muted shaded colours which can be placed next door to different colours to enhance their brightness.

## 5.3 CYMK

CYMK is a subtractive colour model which is predominately used in colour printing but I think when used in calligraphy will produce a different and individual effect. So the four colours or inks used in printing are cyan, yellow, magenta and black which is the key colour. In printing this model works by partially or entirely masting colours on a lighter or usually white background. The ink will reduce the light that would other wise be reflected. As the inks subtract the brightness from white this model is called subtractive. To produce deeper black tones unsaturated and dark colours, black is used instead of a combination of cyan, magenta and yellow. This also saves on money and ink. So I used this process in my swatches and found when

making a colour darker with black using gouache the colour was very dull and not bright and exciting at all.

#### 5.4 Red, blue and yellow

So the last system I investigated was red, blue and yellow. This is a historical set of colours used in painting. These generally are magenta, yellow and cyan. These were combined like the other systems in the swatches to get the widest range of colours. In the 18th century RYB became the foundation of the theory of colour vision. In the past the colour green was added to the mix. These three primaries are pure colours which cannot be created by colour mixing. The primary colours when mixed make secondary colours. Each colour has its own complementary which sits opposite on the colour wheel.

So I think all three systems have a place when using colours but some are more useful than others and produce more of a variety of useful colours. The CMYK system uses black to darken a colour mainly to save money, on inks but in painting and calligraphy this colour system darkens and deadens the piece. Colour systems used by scientists and painters are entirely different and this system shows this. The RBY is really the precursor to the two reds, two blues and two yellows although I could not find any evidence for this. During my research doing the swatches it produced limited colours. Lastly two reds, two blues and two yellows produced the most variety of beautiful colours. This is because it uses colours that have an orange, green or purple bias so producing the greatest range of colours that can ideally be used. All three systems are useful as will all create a unique piece whether it would be successful just using RBY is another thought.

#### 5.5 Other Colours

So when I enrolled for the water colour painting course I also learnt about other colours which would be added to the mix of two reds, two blues, and two yellows. These were the earth colours, which are very useful and can create some beautiful effects. The earth colours or ochres were the first colour paint used, this was iron oxide. In the classical times the best iron oxide came from the Black Sea City of

Sinope. This area is now called Turkey. The iron oxide was usually stamped with a special seal known as 'sealed sinope'. This later became words for red ochre. Red Indians in North America painted themselves with ochres as they believed it shielded themselves against evil. Ochre comes from the Greek meaning of 'pale yellow'. The meaning changed to something redder or earthier eventually. Ochre is now loosely used to describe almost any earthy pigment. Found abundantly in a variety of tones red, violet, yellow and green earths. Ochres have been used constantly throughout history by all civilizations. Ochres which contains hermatite crystals are usually red orange and red violet. Ochres made with yellow iron oxide are goethite and are yellow a lone. Small amounts of manganese oxide mixed with goethite produces more brown tones known as sienna and umber.

So I decided that I would use some ochres in my colour studies for the dragonfly pieces. This is because they produce individual and quite sparkling colour variation especially when mixed with blues which enriches their colours. The colours can get quite dark this would be good to be used for the writing. I feel writing in a piece looks better the darker it is, but the backgrounds or illustrations should appear light and airy with the variation in the colours. I found this out by carrying out colour studies with them see figure 1.

*Figure 1 examples of colour studies.*



So yellow ochre is full of warmth and glow, it has a semi transparent quality, especially good for painting. It can be used for washes or backgrounds. The best yellow ochres are found in France, other top quality pigments can be found in Cyprus. Burnt Sienna is a lovely colour, a brown with orange hues in it and shows off its best when mixed with a blue. Historically the highest quality pigments came from clays found in Italy near a town of Sienna, also parts of Cyprus and the areas around the Middle East. Venetian merchants imported pigment into Europe from the Middle East. During the 14th century Italians produced a range of hues by roasting sienna which led to the creation of burnt sienna. This colour has good undertones of warmth and a little goes a long way.

Burnt Umber is the darkest earth colour. It is a natural dark brown which leans towards orange. A little Burnt Umber warms the pigment taking away the heat of a colour like cadmium red for instance. It creates an under glow, and can be used instead of black. This colour creates very dark hues and is ideal for using in calligraphy when mixed with blues.



So I have decided I want to combine my ochres with some blues to create a wide range of colours which I use in my pieces about the lifecycle of the dragonfly.

So Cobalt Blue is a neutral colour, it has no colour bias and is not hot nor cold. It is also very good for mixing greens, and useful for a landscape or seascape piece of work.

Cerulean Blue is leaning towards green so has a green bias. It can create subtle tints and shades of colour. It was discovered in 1805 by Andreas Hopfner. George Rowney reproduced this colour in 1860 in England. The name Cerulean comes from the Latin Caeruleus which in turn is probably derived from Caelum meaning sky or heaven. It gradulates as a water colour mediums so particularly good for backgrounds, also when mixing it in gouache if left will separate from the other colour.

Ultramarine is the staple of many palettes, it is a particularly useful colour. It will create depth and strength in painting and pieces of calligraphy. It is a deep blue colour made by grinding lapis lazuli in to powder. During the Renaissance times it was more expensive than gold and very fine indeed on a painting. Some paintings were never finished because it was so expensive to use. During the 14th and 15th centuries it was imported by Italian traders but only the wealthiest patrons to the arts could afford it. It was particularly found on religious paintings. It is a warm blue with a purple bias. It creates lovely purples and lovely greens with umber too. There is also a french ultramarine which is the synthetic alternative. Jean Baptiste Guimet made the synthetic version in 1828 which the pigment more accessible. The colours are close with subtle differences.

So after my colour investigations which include reading and practical work with colour swatches. I have decided to use a combination of ochres and blues in my three pieces. This I hope will help to form a unity between the pieces so they work together.

## 6 VELLUM

### 6.1 Research on Vellum

So part of my study was to investigate different types of vellum. So my first port of call was William Cowleys, the only vellum maker in England. So I received in the post samples of parchment and vellum to experiment with. Parchment and vellum are very different, parchment is sheepskin or goatskin and vellum is calfskin. Parchment is particularly greasy and this grease is difficult to remove completely so therefore difficult to get crisp letter forms. It is also not easy to remove mistakes or errors either. It is of course cheaper than vellum as a slightly inferior material.

So at Cowleys vellum and parchment are both prepared in the same way. They are first soaked in vats of lime, this is so that the skins swell and the hair follicles enlarge so that the hair can be removed. Interestingly all the skins that are used are a by product of the meat industry and are not killed solely for their skins. Summer is a particular good season for this as the hair falls out easily. In the winter this is a harder process so work is carried out mainly in the summer. When the hair is removed the skins are then stretched out on wooden frames. This is under tension at all times, the Parchmenter then scrapes the skins with a curved blade, a Parchmenters knife is made from a piece of steel which is razor sharp. I have seen this process being carried out and it is very skilled work. One false move with the blade and the skin would be ruined. The aim is to achieve a reasonably even surface. A lot of water is used constantly during this process. Some skins are bleached to whiten them and then left to dry naturally.

So I experimented on the following types of vellum, manuscript, kelmscott, natural calf skin vellum and classic calf skin vellum, also reindeer vellum which I brought from a supplier in Finland. These were all calfskin vellums, but different types. The calf skin vellum is the calligraphers, illuminators and painters favourite for dept, clarity, luminescence and fine detail that can be achieved. So all of the vellums were prepared by using a fine grade sand paper. Sanded until it felt like suede. Some people will also remove the grease with pumice which is rubbed over the surface and then brushed away. I found I preferred to sand the vellum with a fine grade sand

paper until it felt like suede then brush Gum Sandarac over the vellum prior to the writing. This was the most successful for me.

Although the same sort of skin each vellum was slightly different. The manuscript vellum can be a white or a light cream colour and is prepared both sides. Cowley's produce four different grades of finish. The surface is abraded to raise a nap, a key to providing a velvety writing surface. They range from finish one which is not abraded which is particularly good for painters or botanical artists. As calligraphers we use finishes two, three and four, with four the coarser. The vellum has two sides, a flesh and a hair side, the hair side reacts better to the pen and is the preferred side to use. The flesh does not often take the ink well. Kelmscott vellum is prepared with a specialist organic coating, this is particularly popular with the botanical artist and watercolour painters. Natural calf skin vellum has variations due to the skins natural features, it has light to dark cream pigmentation. This is particularly popular with book binders. It is prepared on one side only. The final one classic calf skin vellum is prepared on one side only. It is bleached during the process which results in a creamy surface. It has subtle variations in surface tone and character. Popular with painter and book binders.

So I experimented using goat skin vellum and sheep skin parchment. The goat skin vellum is natural white, it has a prominent grain structure which is unique to each skin. It has variations in colour and texture and pattern being more noticeable in the natural than the white. This vellum is not good for the pen but very good for book binding, as dyeing the skin will enhance its grain features. The sheepskin parchment is white or light cream and usable on both sides. It is lighter and thinner than vellum so mistakes would be difficult to erase. Although inferior to manuscript vellum it can be used with the pen. It has a soft smooth surface. So in conclusion in my experiments the manuscript vellum and reindeer vellum was the best for using the pen on and achieving the best result.

## 6.2 Stretching Vellum

So I decided to do a trial piece of stretched vellum to see if I could use this in my main pieces. I first of all cut the pieces of vellum with about a two inch flap all

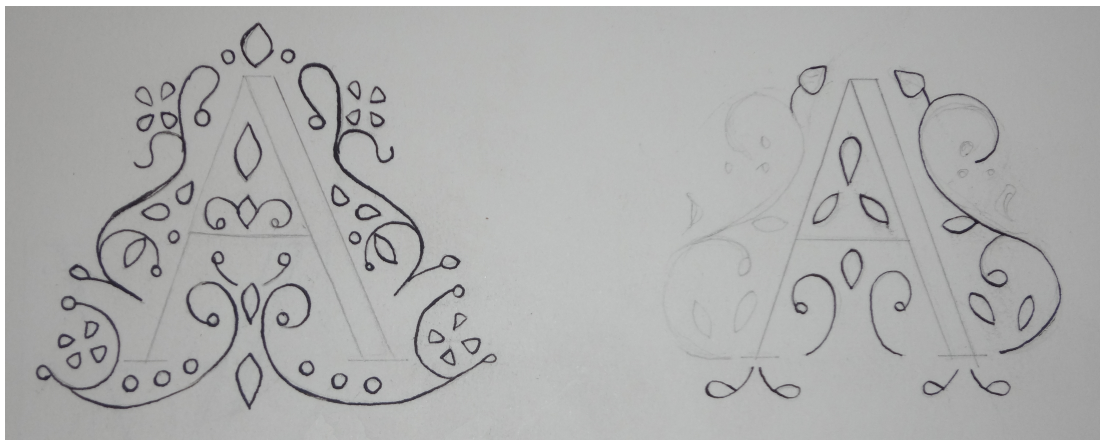
around the main writing area. I then prepared the vellum using a low grade sandpaper so raising a nap and achieving a surface like suede. There is an option to prepare the vellum after you have stretched it but I decided that would be too much of a risk. I think you would probably have to be careful of the corners of the stretched vellum when sanding it. The vellum I chose to use was reindeer, I feel that this was the best option for me. It is relatively similar to cows vellum but a lot cheaper option. The size of my stretched vellum piece was A5 so therefore as small I decided to use two pieces of grey board glued together to stretch the vellum over. If the piece was larger then I would of course used a firmer surface like plywood. I glued the two pieces together and after each glueing I put the board under weights so the board did not cockle. I sanded the edges down so they were smooth and even. I then covered the boards with BFK Rives and after drying under weights sanded down the edges again. I dampened down some newspaper and white paper and laid this on the piece of vellum and then placed weights on top and left till the vellum was slightly damp. Some people use a sponge but I didn't want to over dampen the vellum. I then glued one side of the vellum and then pulled the other opposite side to stretch the vellum across the board. I then stretched the two other opposite sides., glueing along the edge only. The vellum board was then placed under weights for it to dry flat. Doing it this way was successful but it was very important because I was using grey board to place the stretched vellum under weights after each glueing so it would dry flat.

### 6.3 The Vellum piece

So the impulse for this piece was seeing the facsimile of the Arundel Salter. I loved the fact that some pages of this manuscript there was just a gold capital letter on the top of the page and then beautiful writing. I wanted to create my own version of this in a trial piece. I also wanted to experiment with stretching the vellum too. I picked a factual quote about dragonflies as I had decided that this piece would be all about the writing. The script was Cnut that I decided to use as in the Arundel manuscript. The main problem I had was creating a solid layout with definite margins around so the writing had to be worked out that it ended the same on each line. So I spent a lot of time working these how to ensure a solid rectangle. I practiced many times to get the correct effect. I create a gold capital A with some decoration around it in black in to tone in with the writing. The decoration consisted of a fine line of curves written

with black sumi ink to correspond with the writing which was also in black sumi ink. see figure 2. The gold A was in gesso, this I did first then laid the gold many times to create a good solid covering. This was also practiced many times before carrying it out. Then with a copperplate nib I inked in the decoration around the A. I then finally wrote out the quote, I had previously marked out the lines and margins and these were then rubbed out afterwards. I think the piece was successful for a first time. It was quite hard writing on the block after all the preparation of it.

*Figure 2 example of decoration.*



## 7 GILDING

### 7.1 Research on Gilding

I also experimented with various specialist adhesives on vellum and paper. On both of these surfaces most of the adhesives did work which was particularly interesting concerning vellum. That modern day adhesives would work on a surface that is historical. But when using the adhesives you have to look at the effect, the shine, the way that the gold looks afterwards and whether it is smooth. So although they all worked I did not get the effect that I wanted on all of them.

So the first one I tried was PVA, this was quite thick so created an edge, but if you want to dilute it then the brush marks will not show as much. It is usually applied

with an old brush, it is left to dry then reactivated with the breath and metal and gold leaf placed quickly on top. It is particularly good for quick things on paper. I particularly liked some of the newer adhesives like Miniatum. Miniatum comes in two forms an ink and a normal one, they are both very easy to use with good results and very like to PVA. Acrylic Gold Size was also good but important that enough size is applied to get the stick. Another adhesive I tried was Improved Gold Body which creates a cushion like gesso but cannot be used in the pen. The edges are very hard to get a stick with so sometimes dilute PVA can be used to get the gold to cover.

I particularly liked using Gum Ammoniac, which is a natural adhesive which can be seen to be used in historical manuscripts. It can be brought already made but I have used brought and found it very hard to use. If successful you must shake the bottle a lot to mix the ingredients well, but then you get air bubbles which can cause problems when laying the gold. I prefer to make my own using the crystals which are soaked in water for a few days, then the mixture is passed through a ladies tight to remove the stones and little bits left, so the mixture becomes very smooth. I found when using these adhesives it is important to lay enough especially when writing with it. It creates a very good shine and can be polished with silk.

So I tried Gesso which under good conditions can create a stunning mirror shine but does take practice. So you can as well as laying gesso with a brush or quill, you also write with it. Once laid you can use a knife with a curved blade and scrape all the areas of the gesso to smooth the surface out. To tidy up the edges and remove any air bubbles. So making the gesso really smooth, then using a burnisher the gesso is polished and then re activated using your breath and then the gold would be laid. So the polished gesso will react in the same way to a mirror. When you breathe on it the moisture will stay on the surface ready for the gold to be laid. The gilding is best done when the degree of humidity in the atmosphere is about sixty five to seventy five percent. This is important as too little humidity means insufficient moisture for the gold to stick or too much the gesso will soften under burnishing.

I did some trials on paper using gold. See figure 3. I wanted to investigate using Gum Ammoniac and Gesso together, so using a raised gum and a flat gum to see the effect. So I tried two different methods, one putting the gesso on first, applying the

gold then the Gum Ammoniac then the gold, the other was gesso, then Gum Ammoniac and finally all the gold. I waited approximately twenty to thirty minutes between applying each gum so they would dry successfully and not mix with each other. The aim was to have a nice raised effect with the gesso and a smooth effect with the Gum Ammoniac. There was no difference in the outcome of the two methods, they look the same. I used transfer gold first to cover the gums then used loose gold to get round the corners where the two gums meet. When applying the loose gold before brushing off I used glassine paper and a burnisher to really get into the corners, where the two gums meet to get the coverage of the gold, which worked quite successfully. I then burnished the gold, another thing I tried was to just to burnish the Gesso and not the Gum Ammoniac which looked different, but I liked it the most when both were shiny. So with this method I laid the Gesso, left to dry then applied the gold, then burnished, then laid the Gum Ammoniac, left to dry, then applied the gold, then re burnished the Gesso. I have now combined the gilding trials with words. In the figure 4 I have used Gum Ammoniac between the letters, then laid the gold and burnished, I thought this could be used for a heading. In figure 5 I used Gesso first then laid Gum Ammoniac a round the gesso, left to dry in between and then laid the gold and burnished. As this line is in the poem three times I thought I could perhaps make a feature out of it, obviously I don't think I could use both these features in the same piece as too much gold.

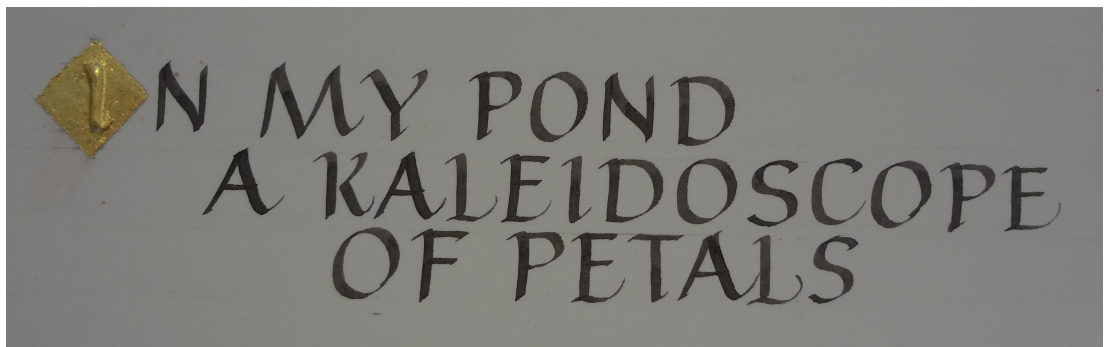
Figure 3 examples of trials with gesso and gum ammoniac.



Figure 4 gold between the letters.



Figure 5 gum ammoniac and gesso.





## 8 THE FINAL PIECES

### 8.1 Introduction

So I have decided to investigate the three stages of the lifecycle of the dragonfly. I have decided to do this by using paper and making three pieces of calligraphy which will be a triptych. I have decided to keep the layouts quite similar but to do different things with them using materials.

### 8.2 The Egg

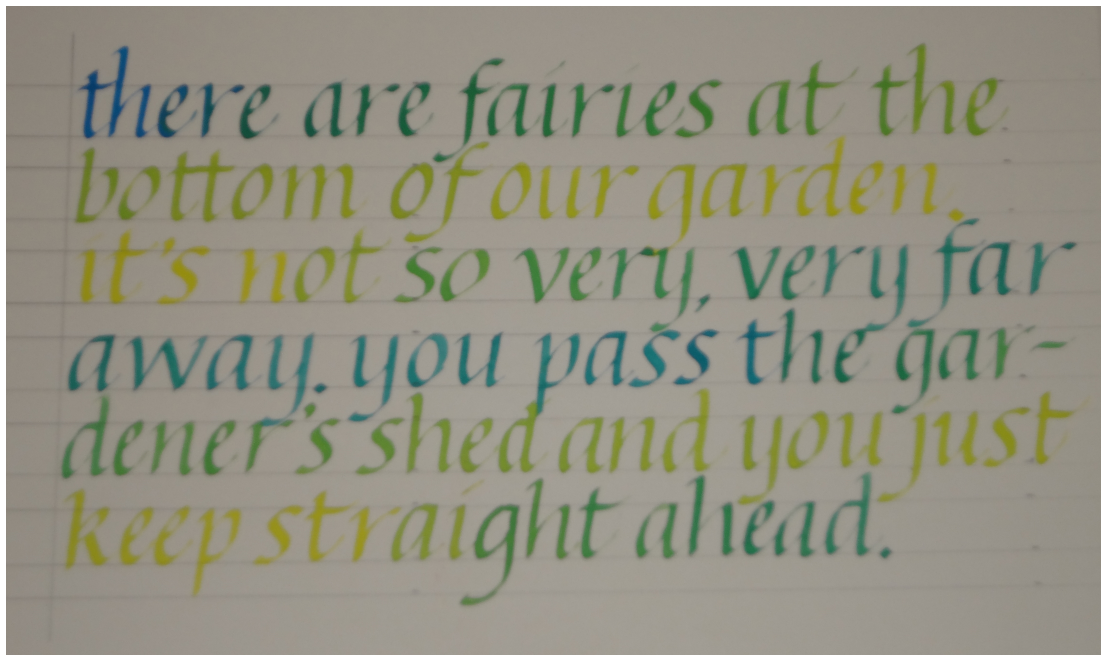
The egg stage will purely be on creamy paper, I thought this would illustrate the gooey egg stage of the lifecycle by the colour. I found it hard to find a poem on this stage of the lifecycle so found one about a pond and imagined the eggs to be in there with the plants. This would be its kind of habitat during this phase of being an egg.

I started off using Cnut for the hand for this piece but have since decided that it would not look right as there are not enough words and the lines are quite short when doing the cut and paste. So I have decided to use Roman Capitals which I really like and combine them with the use of gold. I want the design of each of the three pieces to be quite similar but the hands could be different. I want the design of them all to be similar so they work together as a triptych. I think the line spacing will be different to the other pieces but the overall size hopefully will be the same.

So I have rewritten the layout of the piece in Roman Capitals, and played round with serifs. I decided I would like to have slab serifs but finding them hard to do so went back to San Vito which has slab serifs and wrote the piece out in San Vito. So using San Vito slab serifs on the Roman Capitals. I have also decided to use the gold in between the letters on the heading, the colour scheme will be using a mixture of Cerulean Blue and Burnt Sienna, using colour change in the pen, see figure 6. So mixing six shades of Cerulean Blue and Burnt Sienna and have a gradual change of colour throughout the piece. I tried doing this without mixing the individual colours but it did not work out very well so decided it would be better if I mixed the colours individually. The colour scheme on each piece will be a blue and Burnt Sienna, I

particularly like these colour ranges and the lettering looks better in a darker colour too. These earthy colours relate to nature too, the lifecycle of the dragonfly and all things natural. Using these blues and Burnt Sienna will also make the three pieces relate to one another and work as a triptych.

*Figure 6, trial of colour change in the pen.*



So I have written out two trials of the piece on paper, one in black ink to practice the writing and one with the colour change in. This I think has worked out quite successfully and I am pleased with it. The layout looks good too, I think I just have to practice the heading a bit to space it out, so there is room for the gold in between the letters. The main text was done with a number three nib and the heading done with a two and a half. The serifs look good on the Roman Capitals too, and I have laid the gold for the heading so getting a good ideal how it will all look on the vellum. I used Gum Ammoniac as the glue for the transfer gold which I made myself.

So the layout is slightly off centre, I tried a few layouts, including altering the line endings and just centring it but it did not look good. So I went back to the original layout that the author did and tried then centring it and then slightly off centring each line, this version looked the best.

The words of the poem are as follows:

in my pond  
a kaleidoscope  
of petals

red like moms hot beets  
juniper berries  
and cherry mesquite

in my pond  
a collage of dreams  
for my fantasy

yellow as the sun  
ripe lemonettes  
and bright egg yolks

in my pond  
a bouquet of joy  
for my heart's deploy

blue indigo  
azure delights  
cerulean splash  
8.3 The Nymph

The nymph stage will also be on paper, demonstrating that the nymph is in between two important stages, it has left behind the egg and now growing in to a dragonfly eventually.

So I have decided the layout will be centred as it suits the writing, I did try just off centring the lines but it did not look right with the writing. I am going to use the Cnut hand for this piece. I experimented with the heading and because the lines are not as long as the heading, have split it in to two lines. I have decided to use flat and

raised gold in this piece on the heading and decoration at the bottom of the piece. So the M in the word nymph on the heading will be raised using gesso and around it representing an egg in an oval will be flat gold using Gum Ammoniac. At the bottom there is an egg shell in raised and flat gold, representing the nymph which has left the egg. The colours I will be using for the writing will be a mixture of cobalt blue and burnt sienna.

The words of the poem are as follows:

The life of a larva  
began as a nymph  
an alien creature  
no wings yet crusty hump  
hanging on to the back

In water they grow  
marshy areas and ponds  
calmer backwaters  
they grow.

They develop  
eating away into  
beautiful dragonflies.

#### 8.4 The final piece

So the final piece is about the Dragonfly's winged stage when they emerge as an adult. To me this is the stage that the dragonfly will crave, this is the dragonfly living its life to the full, flying around free as a bird. So I wanted to create this sort of feeling in the piece.

So to me I concentrated on the writing to create a flowing free feeling using the hand Cnut. I made the hand particularly flowing and flourished slightly on the endings of the strokes. I progressively developed this as I wrote out out and practiced the piece.

I decided that the piece would look good with a centred layout after I experimented with the layout and trial pieces. I kept with the blue and burnt sienna theme and mixed quite a dark colour mixture, then I used a watery version of the colours with the decoration. I decided to draw and paint flying dragonflies, three in fact of different sizes flying around the writing. The colours that I used were Ultramarine and Burnt Sienna. The piece was written on Fabriano 5 paper. This piece to me evolves a happy carefree feeling of living life to the full. It is interesting to note because of the three subject areas I found it hard to find suitable poems and quotes so altered and made my own up.

The words of the poem are as follows:

I cry at night for a part of me that aches  
a dragonfly friend I once had  
a spirit none can break  
is surely gone by now

It was not a mistake  
when all alone we bend the rules  
though I still cry at night  
that creature was a mystical sight.

I used to believe in a bearded man  
a bunny bringing gifts at night  
I believed in something far away  
beyond my truth, a fake charade.

And now I see  
the dragonfly wings beat on  
alive in memory  
hope for eternity.

## 9 CONCLUSION

So I wanted to make three or four pieces representing the Dragonfly, three pieces are illustrating the lifecycle of the dragonfly and one scientific view piece. I think the lifecycle pieces work well together as a triptych. The colours are all similar with a mixture of blues and burnt sienna. I have also used gold on two of them, the egg stage with flat gold and the nymph stage with flat and raised gold. The dragonfly piece is more about the flourishing writing as the dragonfly emerges from being a nymph, free and flying, also with illustration. They are all similar sizes as well. I enjoyed learning Cnut and found it very satisfying to do. The Roman Capitals with similarities to San Vito was good also. Cnut and Roman Capitals are good reading scripts as I wanted people to read the poems and quotes, this was an asset.

The one hundred day practice books I did with Versals and Cnut were very interesting. This is because I saw my progress throughout the pages, from day one to day one hundred, I wrote a page a day. The books I wrote from in both scripts were about bugs, creepy crawlies and dragonflies.

At the exhibition they were hung side by side in order, the egg, the nymph and then the dragonfly. They were double mounted with the colours being cream and a dark blue, which fitted well with the colour scheme. The scientific vellum piece was displayed in a case.

During this project I have worked hard on getting some of the techniques to be of a higher standard, particularly the flat and raised gold gilding. This was the purpose of doing this and I think I have improved but with more time will get even better. But now I am sure of the way in which to improve and what materials to use through experimentation done during this project.

The colour research was very important to me as I wanted to re-visit and improve. I think I have done this, I have a huge selection of colour swatches now of different colour systems and have experimented with other colour combinations that I didn't know about at the start of my research. This will hold me in good stead for future work. I really enjoy colour and want to make this a feature in my future work.

The vellum work was a hard thing to do, writing on another surface. I found it particularly stressful when stretching the board but pleased I completed this. When using this material it is only the start, which I will continue in my future work. I really enjoyed and felt very satisfied when completing the vellum piece. I would like to revisit vellum again and now with the knowledge I have gained will be more confident.

So all in all I have enjoyed this final project and feel it was successful in many ways. The material research was particularly useful for the future work. Illustrating the lifecycle of the dragonfly was an exciting prospect and I feel I have done this to the best of my abilities.

## REFERENCES

Knight. S. 1984. Historical Scripts. New York: Taplinger

Robertson. M. 1998. Bugs, The Encyclopedia of Creepy-Crawlies: UK. Quadrillion.

Ball. P. 2008. Bright Earth, The Invention of Colour. UK: Vintage.

Morgan. M. 2006. Illuminated Letters, A treasury of decorative calligraphy. UK: Quartro.

Prescott. A. 2002. The Benedictional of St Aethelwold. UK: Folio Society.

Beccaloni. G. 2010. Big Bugs, Life-size. UK: Natural History Museum.

Lovett. P. 2015. Illumination, Gold and Colour. UK: L. Cornelissen and Son.

Cnut The Great. URL. [https://en.wikipedia.org/wiki/Cnut\\_the\\_Great](https://en.wikipedia.org/wiki/Cnut_the_Great) (accessed June 2016)

RYB Colour Model. URL. [https://en.wikipedia.org/wiki/R\\_Y\\_B\\_color\\_model](https://en.wikipedia.org/wiki/R_Y_B_color_model) (accessed May 2016)

URL. [CYMK Colour Model. https://en.wikipedia.org/wiki/C\\_Y\\_M\\_K\\_color\\_model](https://en.wikipedia.org/wiki/C_Y_M_K_color_model) (accessed May 2016)

URL. <http://www.colormatters.com/color-and-design/color-systems-rgb-and-cmyk> (accessed June 2016)

URL. <http://www.williamcowley.co.uk> (accessed September 2016)

Illumination, Gold and Colour, Patricia Lovett

URL. <http://www.britroyals.com/kings.asp?id=canute>