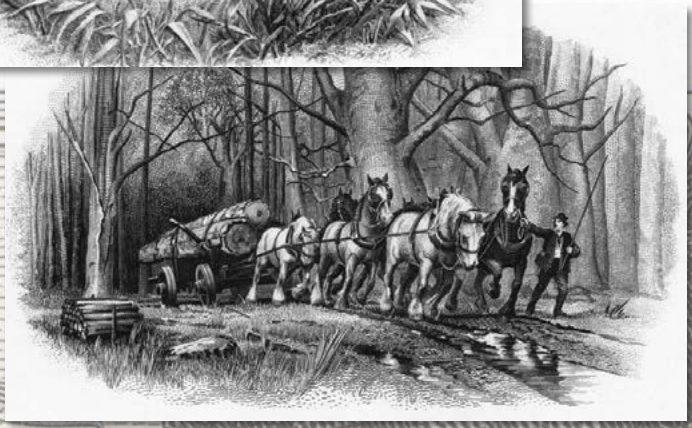
Chris Matthews: A Career In Engraving (Part 1)

By Glenn H Morgan FRPSL

Glenn Morgan talks to engraver Chris Matthews, a craftsman who has transitioned from traditional burin engraving/etching onto steel dies, through to 'engraved' on computer and who recently 'engraved' Royal Mail's Long to Reign Over Us miniature sheet.



Figs 1 to 3 Images from the Bradbury, Wilkinson vignette book which were inspirational in Chris's early career and still fire his imagination today

Christopher Matthews, born 1960 to parents William (Bill) and Joyce, seemed pre-destined for a creative career path. His father had joined security printers Bradbury, Wilkinson (BW) in 1937 as an artist/designer, an interest maintained throughout his 91 years, submitting 11 stamp designs to the GPO, along with his many banknote designs. Bill's whole career was spent with BW, meeting Chris's mum there pre-war where she was working in the accounts section.

Inspirations

I started by asking Chris about his inspirations and he cited fellow BW engravers, particularly Chris Broadbridge, claiming that his attitude to the craft and his whole demeanour suited him the most. In fact, Chris B was how he had wanted to see himself as an engraver when he qualified. *(Technical expressions used below are explained under Terminology and are highlighted at first use within the article in* ***bold*** *text.)*

Stimulation continues to come from early 20th century **engraving**s in the BW **vignette** books (*Figs 1* to *3*) now held by De La Rue (DLR) and these volumes really fire his imagination to this day.

Chris said that: 'The textures and depth that these old masters of the craft could achieve was just beautiful. However with changes in **inks** and printing machine speeds, it would make it virtually impossible to print these sorts of images well today. Chris also marvelled at Slania's abilities, but even he had produced his share of 'pedestrian' looking engravings. This was probably due to the inferiority of some of the source designs. Chris added: 'While the quality of the final engraving will ultimately be the responsibility of the engraver, he is simply converting the design into a printable image and may not be culpable for any poor quality looking stamps that result!'

Education and employment

Excelling at maths, physics and chemistry at school, Chris thought that he would become a mechanical engineer and took his Cambridge University entrance exams, but eventually decided that it was not for him.

1980 to 1986: Bradbury, Wilkinson

Always artistic, Chris loved to draw and paint as a child, and so when his dad said that BW were seeking engraving apprentices he put himself forward. He was meticulous, a good copyist, and top of the class in technical drawing, meaning that this choice of livelihood would be a perfect fit and so readily accepted the offer of employment that followed.

Fig 4 A photograph of Chris doing a trial vignette for Malaysia as an apprentice at Bradbury, Wilkinson

Chris was apprenticed for four years under the tutelage of several journeymen engravers, including the well respected Chris Broadbridge and Alan Dow, who engraved The Queen's portrait for the Bank of England, spending three months at a time with these journeymen

ensuring a well-rounded understanding of the craft. Chris produced engraved elements for a few issued banknotes from year two of his training, but no stamps until later.

BW initially sent its three engraving apprentices—Chris (*Fig 4*), plus Gary Procter and Tony Maidment—to the Sir John Cass School of Art for two days a week to gain a wider view of fine art, to include classes in life sketching in pencil and charcoal, still life painting and sculpture in both clay and Perspex.

I expressed surprise at the inclusion of so many aspects of art perceived by me as irrelevant to engraving, but Chris explained: 'It expanded my knowledge of fine art and my overall artistic confidence increased, which transferred to my engraving work. I believe that engraving should not just be a flat copy of something, but deserves to have some life about it. Thanks to my time at John Cass, I continue to strive for this.'

Following the sale of BW to DLR in 1986, some engravers left so, as a sweetener, they promised to train Chris as a portrait engraver (still seen as the pinnacle of engraving), but the promise was not met soon enough and so he also left following approaches by Harrison, who had decided to start printing banknotes. It was a difficult decision, but DLR had just moved to **photopolymer** plate-making from steel, seen as a lesser method of **intaglio** plate production frowned upon by the engravers, whereas Harrison intended using **Kobex** plastic moulding, considered far superior and more akin to the original steel transfer method.

1986 to 1997: Harrison

Chris received additional training from Joseph Keen (1919–2004), the Dean of English portrait engravers, working on around half of all Harrison banknote designs, perhaps 25. Chris said that it was not until 1986 that Harrison had its own in-house engravers. Eventually Harrison also chose photopolymer, to compete on time and cost with other printers, now being considered an acceptable way of getting an intaglio image onto paper. Hand engraving consequently gave way to drawing with ink on **Kodatrace** as an original master **die** was no longer required, latterly moving on to Adobe **Photoshop** and **Illustrator** software, of which more later.

1997 to date: De La Rue

When DLR bought Harrison in 1997, Chris worked initially in Quality Control (QC) at Basingstoke as no more engravers were required at that time, later becoming Studio Manager in charge of QC and pre-press assembly. After 15 years he is now 'back on the bench', 'engraving', four days a week from the studio in his home and one day at DLR's headquarters in Basingstoke.

Creating an intaglio die

For over 140 years methods of engraving and platemaking scarcely altered, but during Chris's time in security print from 1980 onwards print processes have dramatically evolved.

The intaglio method, variously known as recess, line-engraving, copperplate/steel engraving, or siderography (transfer engraving), all relate to the same process (Gravure works on a similar principle, but lacks the raised imagery (tactility) and therefore much of its collector appeal). The aim of intaglio, indeed all processes, is to get ink onto a **substrate**, with each engraving method achieving this.

Vignette and portrait engravers tend to use either square or lozenge-shaped gravers, the many other types were generally employed in lettering or ornament creation.

For intaglio hand engraving or **etching** of a die, different types of **burin** (*Fig 5*) are used to generate up to 30,000 recessed lines, dots or dashes for various textures (*Fig 6*), giving engraved stamps their unique raised and tactile feel. **Pointing-in** lines through a wax covered die then etching with acid can give a similar result.

Intaglio has been popular with British philatelists since the 1840 Penny Black and has subsequently been used for high values 1913–77 and 1988–2003 and on occasional commemoratives and prestige booklets. It has also been widely utilised around the world, only starting to die-out when other processes like gravure and offset improved. Intaglio, perceived as slow and expensive, is now generally used where it would enhance a design.

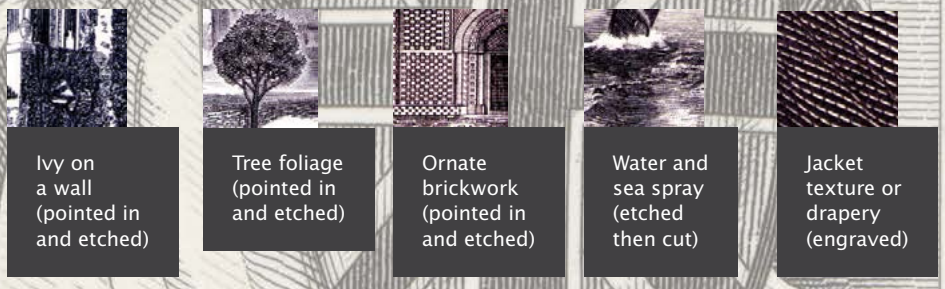
French stamp engraver Pierre Albuisson states that intaglio production in France is not 100 percent more expensive than offset as claimed, just 10–15 percent dearer and that myths were peddled about comparative costs to justify switching away. Through his campaigning, the process again thrives in his homeland and in Scandinavia and Eastern Europe the engraving scene is also healthy with strong collector interest providing increased sales and justifying the extra expense.

Hand engraving

Rarely undertaken after year 2000 by British security printers, the design image and text were **dry pointed** onto the surface of the die in reverse then cut into the steel die with a graver to varying depths below the surface. Ink was applied to the plate, excess wiped off and the substrate pressed under great force against the die by an impression cylinder, squeezing into the inked grooves, extracting it and transferring image to paper. The design became a mirror-image of the die with the stamp now viewable normally ('right reading').

Progress proofs could be made during the die creation process to check quality and accuracy, although Chris rarely felt the need to do so until the die was approaching completion. Instead, he put a mix of talcum powder and black ink into the recesses of the die, giving a black and white image when viewed under a bright diffused light, thus showing progress without the daily proof pulling done by some engravers.

Above: Fig 5 Different types of burin tip



Figs 6 Different engraved textures, as created by Chris especially for this article

Etched engraving

A steel die is coated with wax by melting it on the preheated die. A special wax ball placed in a silk cloth is rubbed across the hot die. It is then spread thinly by rolling with a smooth rubber roller. It must be free from dust and fluff. Once the die cools, the wax forms a smooth acid resistant surface.

A tracing is then prepared by placing a piece of clear acetate (film) over the subject to be 'engraved'. With a very sharp steel point, Chris traces around all the detail and structure of the image, using a dotted line to outline different tonal areas. The finished film resembles a sort of painting by numbers. The **burr** is then scraped off the film carefully, so it doesn't breech the wax layer, and it is dusted with an orange powder (graphite can also be used). This film is then placed face down on the wax covered die and burnished to transfer the image in reverse onto the die.

The line content is then drawn through the wax with a more rounded steel point using a set of **parallels** to rest against for greater control, being held off the surface with a thin cardboard frame. Different divisions of line and structures are drawn depending upon the subject, animal, building, landscape etc., to best describe the surface texture, taking into account foreground, distance and relative tonal values.

Once the whole image has been created in line-work the die is prepared for acid-etching by painting the outside edge and any other areas not requiring etching with shellac or bitumen.

Acid is then painted on various areas increasing the width and depth of lines, matching the original artwork for tone and texture. Areas not wished to be etched further can be 'stopped out' by use of the shellac. Depending upon the size and complexity of the image, it can take up to a day to acid-etch a complex image, with the acid only attacking the bare metal and not the protected areas. The acid is 'killed' with water; the wax ground is then removed with solvent revealing the image beneath. Rarely is it finished then. It may require re-etching deeper in certain areas or 'tickling up' with a graver 'pushing up' the whites or adding crossings to increase tone.

Hand drawing

Hand drawing has been a major transition towards engraving by computer today. The image to be 'engraved' is enlarged to four or five times size, depending on the subject. A piece of Kodatrace is placed over it. The 'engraving' is usually commenced by pencil sketching out the required line structures. Once happy with progress, 'Rotring' or similar pens are used to make the image permanent in black ink. The line structures utilised in the drawing are the same as those used in steel engraving.

The finished image can then be progressed to platemaking and print, either photographically or by scanning at high resolution (8000 dpi) as a one-bit tif file (black and white). This scanned image can then be opened in Photoshop and converted to a greyscale tif so that it can be edited, before sending to computer engraving equipment.

Computer engraving

Ever since the inception of computer use in graphics it has been the 'Holy Grail' in some quarters to be able to input a photograph of the subject; portrait or vignette, press a button and get a computer generated engraving. Although this is possible to an extent, the finished piece looks very much computer generated. There are bespoke software packages supposed to help this process, however it now seems to be accepted that the computer is only a tool like any other, therefore just an aid to a qualified engraver.

Chris now uses Photoshop and Illustrator software to create his engravings. He uses his many years of experience to manipulate the tools creating images that have all the quality and look of the older methods. Using a **stylus** and tablet is fairly intuitive and the software makes certain tasks easier, particularly ensuring that line weights are printable and that engravings can be modified more easily if required. There is one draw-back over the other methods and that is that you have to make judgements about the image on a computer screen at various magnifications and resolutions which don't always correspond very faithfully to the finished print. The benefit of drawing on Kodatrace is that you have something tangible in your hand to review instantly. Of course you can send data to an inkjet or similar printer, but this will only be a guide.

Chris stated: 'Surprisingly for an electronic process, the final engraving can have a real charm about it, much like the etched method. By using 'dodging' and 'burning' tools in Photoshop I can lessen (dodge) or fatten (burn) lines, much like etching a die with acid, but on screen'. It also enables artwork to be resized and 'flipped', working as it will appear when printed.

Photopolymer plates are now used regularly by artist-engravers for proof prints, ensuring results match the image required for the production run and avoiding expensive, time-consuming reworking later on.

Wrong assumptions

One real surprise was how a die may be engraved traditionally in five weeks, but a computer-based engraving may take six to eight weeks. Likewise, while a computer enables elements to be cut-and-pasted into an artwork, there is the danger that it may look 'homogenised', like an identikit image, so great skill is required to avoid this problem. Another revelation is that Chris deems this latest method of 'engraving' to be every bit as skilful as hand engraving, it just utilises a different skill-set.

With the stamp design now produced as an engraved die by one of the above methods and with the proof pull approved by the customer, Chris's work is complete and it is time for the job to progress to the pre-press and printing stages, which are beyond the scope of this article.

Glenn's in-depth interview continues next month during which Chris discusses his many postal-related engravings, including the 1988 Castles high value definitives and Chris's personal favourite, the 1990 150th anniversary of the Penny Black miniature sheet.

A Burin

A Burr appearing

Terminology

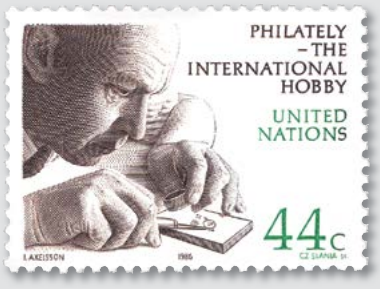
Burin. A French term for a range of tools used to incise the design and lettering in reverse into the die. More commonly known by UK engravers as a graver.

Burr. The curl of metal that results from pushing the burin across the surface of the die. Also the rough line created when tracing the detail of an image on gelatine film.

Die. A highly polished metal block, usually of soft steel, that the engraver cuts the required design into.

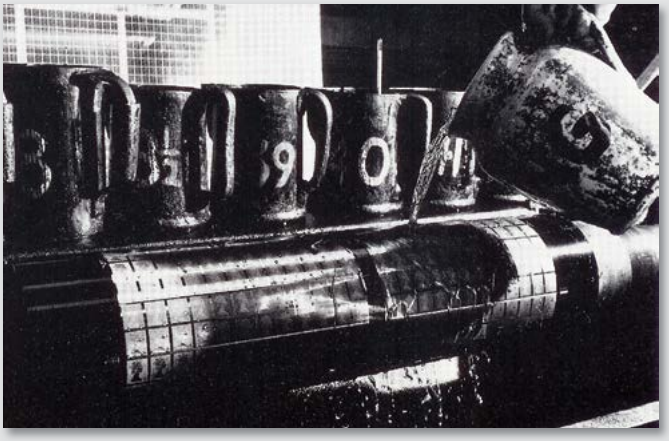
Dry Point (Pointing-in). A hard-pointed 'needle' of sharp metal used when incising an image into a die. The tool is closer to resembling a pencil than an engraver's burin. 'Dry Pointing' refers to drawing detail onto the die so that it can be made permanent with a graver, 'dry' meaning no use of acid.

Engraving. The art of transferring the imagination of an artist-engraver onto a medium that can be used to replicate onto a plate or cylinder and to later print multiple times onto a substrate.



An engraver working on a Die

Etching. The use of acid to etch an image into a cylinder or die, as in this 1979 Harrison photo depicting preparation of a gravure cylinder.



A picture of etching in progress

Illustrator. A scalable vector graphics editing software program from Adobe. It is especially suited to work on portrait engraving.

Ink. To print by intaglio the ink has to be oil-based and viscose (thick). It quickly develops a dry skin over its surface, known as curing, but is said to never fully dry. Other printing methods utilise specific inks that are much more fluid.

Intaglio. Pronounced 'in-taly-o', this is an ancient process relating to a design that is incised or engraved into a material.

Kobex Moulding. A thermo plastic that moulds itself to the design on the die, under heat and pressure creating a raised impression. This is then given a thin silver coating to act as an electrical conductor and copper is grown onto the Kobex to create one of the many individual images that go towards making-up a full plate. They are joined by the use of Radyne Welding equipment.

Kodatrace. This special kind of tracing paper is made of a frosted acetate film, used with pen and ink to create enlarged engraved-looking line work.

Parallels. A drawing aid made of two strips of wood or brass, linked by diagonal bars used commonly by navigators on board ship to plot their course. Engravers use them to rest against whilst 'pointing in' to gain better control, also to help create series of parallel lines if required, for skies, etc.

Photopolymer (for intaglio). Photopolymer is a photosensitive material in sheet form that is exposed to UV light through a positive film. The light shines through the clear sections of the film and hardens the polymer. The plate is 'washed out' with water and the exposed areas are left to form the surface and the unexposed area is washed away.

Photoshop. Image-editing software from Adobe that enables a digitally captured artwork to be manipulated on-screen as a bitmap.

'Pointing-in'. Drawing through the wax ground with a more rounded point to later be etched.

Stylus. The electronic equivalent of a pen or pencil, but linked wirelessly via a tablet to software that captures and saves onto a computer the work undertaken by the artist-engraver.

Substrate. The material that the intaglio image or stamp is printed on to. Usually this would be paper, but it may even be made of silk or other polymer or hybrid material these days.

Vignette. The central image area of a stamp, such as Chris's engravings of the castles. Any image other than a portrait i.e., animal, building or landscape, etc.