

## Innovation in Enamel

Transcript of the paper presented by Jessica Turrell at the Innovation in Enamel Symposium held at UWE, Bristol on 15<sup>th</sup> July 2010

Image numbers refer to the linked PowerPoint presentation

*(image 1)*

This morning's presentation will discuss the project I have been undertaking for the past three years here at UWE, entitled *Innovation in Vitreous Enamel Surface for Jewellery*.

To give you some insight into my background, I studied for my jewellery degree at Central Saint Martins where I was introduced to enamel by Jane Short and Fred Rich. Jane, in particular, inspired me to develop the necessary patience, and devote the time needed, to become skilled in enamel and my final collection and my practice after college focused on the creation of enamelled jewellery using traditional techniques such as cloisonné and champlevé.

*(image 2-7)*

Over the years my own work has gradually moved away from this more traditional practice and now involves a number of techniques more readily associated with large-scale and panel enamelling. I use a lot of etching in my work, building up layers of enamel over an underlying etched surface and then abrading the layers back in a process that reveals what has been concealed. I have developed an experimental approach to enamel that allows me to achieve an ambiguous and expressive surface quality. The development of my personal practice has reinforced my conviction that enamel has huge potential as an expressive and innovative material.

Along with these changes to my technical approach I have become increasingly interested in the conceptual aspects of contemporary jewellery, seeking out work that is concerned with more than beauty and tradition, work that addresses contemporary issues and that is expressive in its choice of materials. I have also become increasingly aware that within the contemporary jewellers community there is little recognition of the expressive potential of enamel. I also recognize that many of the jewellers who do specialise in enamel are unwilling to move beyond a traditional and highly skilled practice in order to explore a more contemporary approach.

In 2006 it was suggested that I apply to the Arts and Humanities Research Council for a grant under the Fellowship in the Creative and Performing Arts Scheme. It seemed obvious, based on my engagement with both jewellery and enamel, that I should submit a proposal for a research project that would investigate the potential for enamel in contemporary jewellery practice, and make an attempt to understand the factors that might motivate the apparent antipathy towards enamel common in the contemporary jewellery community. I also aimed to develop strategies by which this negative attitude might be overcome. I was delighted when my proposal was accepted and in September 2007 I embarked full time on the three-year practice-led project.

### The two strands

The project has consisted of two distinct strands of research. The first of these was the practical and technical research while the second was a theoretical exploration of the place of enamel in contemporary jewellery practice.

*(image 8)*

As part of this second strand I undertook contextual research and the results of this research reinforced my opinion that most enamelled jewellery practice falls into one of three main categories, (and let me emphasise that through out I am referring to enamelled *jewellery* and not three-dimensional and panel work) The first of these categories is 'fine' enamel, which is highly skilled work (or work that strives to be highly skilled) that concentrates on traditional enamelling techniques to create work for a mainstream or commercial market. The second,

that I have called 'new enamel' is work that itself engages with contemporary ideas but where enamel is used simply to add a paint-like layer of colour to the surface of the piece using only basic techniques. The third category, that I have termed 'innovative' refers to work where the two practices of *fine* and *new* overlap and the artist is able to demonstrate both a knowledge and understanding of the material and a desire to use enamel to explore contemporary aesthetics and concerns.

My research showed me that majority of British work falls into the first category, while the work of a small number of enamellers, particularly younger artist, falls into the second category. What proved to be a rarity was British work that would fit with this project's definition of innovation.

Of course this does not imply that there is no innovative work being produced in the UK. While I continue to discuss the theoretical aspects of the project I am going to show a selection of images from an international group of artists that clearly demonstrate that enamel practice can be exciting and vibrant. This is by no means a definitive selection but includes some of the work that will be included in the Innovation in Enamel database currently under construction. ([image 9-44](#))

I believe that there are a number of factors that contribute to enamel's status as an overlooked or dismissed material. I would briefly summarize these as follows:

If, as it appears, there is an expectation that contemporary jewellery practice should be underpinned by ideas, it might be argued that it is no longer enough to make work that is merely concerned with the status of the materials or the evident skills employed in the making process. In this context the issues of beauty and decoration commonly associated with the use of enamel could be considered outdated.

Enamelling is a difficult skill to acquire; to do it well requires time, patience and perseverance. Firing a piece at temperatures in excess of 800 degrees centigrade, sometimes many times over, puts the piece at risk and this can be a risk many jewellers are unwilling to take. If colour is required it is increasingly acceptable for this colour to come from a wide variety of materials such as paint, pigments and plastics, all materials that don't carry the burden of value and tradition.

There is a well rehearsed argument about craft practitioners who reject skill in a bid for fine art status which I don't intend to go into here except to acknowledge that there is trend for deliberately 'sloppy' craftsmanship in contemporary jewellery that extends to the use of enamel where immediacy and freshness are sometimes valued over work that demonstrates the high levels of skill associated with traditional enamelling.

Clearly the quality of teaching and technical instruction available to students is significant if complex skills are to be passed on in a way that encourages exploration and innovation. It would appear that there is a lack of specialist enamel teaching and poor or non-existent facilities within many higher education institutions. In general where enamel does form part of the curriculum a set of rather prescriptive traditional practices are passed on that can alienate all but the most determined. Alternatively students are introduced to the basics and then left to muddle along as best they can. This is not always the case and there is of course some excellent teaching in the field but much of the innovative work being made can be traced back to a handful of influential tutors who introduce enamel in a much more open and experimental way, calling on industrial and large-scale techniques that allow for more of a sense of personal expression.

I was disappointed to see how little enamel work was on display in the collections of this year's crop of British jewellery graduates at New Designers.

([image 45-47](#)) With the exception of graduates from Edinburgh College of Art, where there seems to be a developing enamel culture, those who were working with the material

reported that they had often had to go outside their department to find information. When we have examples of colleges worldwide such as Halle in Germany, RMIT in Australia and many of the American colleges including Kent State University, Cleveland Institute and East Carolina University, where enamel is a core part of the curriculum and where exciting and experimental work is being produced, it is incredibly discouraging that this enthusiasm about the potential of the material is not conveyed to the current generation of British students. It seems that in the present financial climate this situation will only get worse as department budgets are cut and visits from specialists and oversees tutors become an unaffordable luxury.

I hope that this afternoon's session on enamel in education will provide a forum for a more in depth discussions of an issue that is important to all of us with an investment in the future of enamelling.

I have written in greater detail about the theoretical aspects of this research in a paper entitled *Surface and Substance* to be published in the journal *Craft Research*, later this year. The paper will also be available online for anyone wanting further reading.

My aim has been to demonstrate the potential of enamel through a variety of approaches. One is, as I have said, to identify innovative contemporary enamel jewellery within the terms of the projects and to disseminate this work as widely as possible through a number of projects, which includes: a fully searchable and publicly accessible database; a major international touring exhibition due to start in 2011; the publication of academic papers, events like today's symposium and a paper that I will deliver at the Association for Contemporary Jewellery conference next week. All of these events are aimed at raising the profile of contemporary enamelling and exposing as wide an audience as possible to its potential.

#### Practical Work

In order to develop the practice-led element of the project I set myself what might have appeared to be a relatively simple brief. This was to take the non-traditional approaches and techniques for mark making in enamel I had developed over the years prior to the start of the fellowship and apply them to a three-dimensional jewellery form. I choose this approach because I believed that in doing so I would develop techniques that other enamellers could use and that might promote experimentation and investigation.

I believe that one of the factors that hinders experimentation is the need to avoid risk. When a piece has been painstakingly constructed enamellers are understandable unwilling to push the boundaries of what is possible and maybe risk failure. My proposition was that if a three-dimensional piece could be created relatively easily, with no solder joints that might be harmed by the high temperature firings and that had the potential to be replicated any number of times this might allow the enamelling process to be approached with a greater sense of freedom and playfulness.

Whilst early on the practical aspects of the research involved investigations into fusion and laser welding, and trials of the interaction between enamel and a variety of different types of solders, it quickly became clear that a detailed investigation into the technique of electroforming was going to be the most productive strand of research.

As a simple explanation of electroforming it can be defined as the process by which metal particles are deposited onto a base form through the process of electro-deposition in a layer that is thick enough to be self-supporting. It is possible to electroform on a metallic base or to use electro-conductive coatings to make many other non-conductive materials suitable for electroforming. Generally if the form is to be enamelled it must be possible to remove the base material thus leaving a hollow form.

[\(image 48-54\)](#)

Electroforming has been used in conjunction with enamelling by a number of artists, particularly in the USA where the most notable exponents are Jamie Bennett, Maria Phillips and June Schwartz who has been making vessels that use a combination of electroforming and enamel techniques since the 1960s. This image, which I took when Elizabeth and I had the opportunity to visit June in 2008, shows the electroforming equipment in her studio in California.

Although aware of the work of these and other artist I was unable to identify any formal published research regarding the combination of enamel and electroforming

My first step was to take a short course at the Jewellery School in Birmingham where senior lecturer Les Curtis has developed a high-tech electro-deposition laboratory. After the course Les was generous enough to provide me with ongoing support as I went about sourcing and building an electroforming system at UWE.

*(image 55)*

This 100-litre tank is designed specifically for the production of copper electroforms. Electroforming in silver has not formed part of this project in part because of the costs of materials but more significantly because the silver process uses a cyanide based solution and without a dedicated lab (and a technician happy to handle cyanide) it was not possible to meet the rigorous health and safety requirements.

*(image 56-60)*

The following set of images show the stages of the electroforming process.

*(image 61-62)*

One of the aims of the electroforming research was to be able to make a repeatable form. To this end the next task was to undertake research into mould making and establish which expendable mandrel (or base-form) materials were most suitable for this.

Most of my samples used wax as this is easy to cast, can be carved and shaped and is simple to remove once the electroform is complete.

*(image 63-65)*

I also undertook a strand of research with my colleague Dr Peter Walters where we investigated the potential for creating base forms through the process of rapid-prototyping using a Z-Corp 3-D printing process. We began by scanning a group of hand carved forms and inputting the data via a computer programme.

The objects were then built using the Z-Corp system where layers of powder and binder are printed to build up a three dimensional object. The finished objects were then impregnated with a hardener that allows them to withstand immersion in the electroforming solution.

As with all of the non-metallic objects used in this process the resultant forms were coated with an electro-conductive paint, in this case one that is copper based, before being electroformed.

The potential of this process, which Peter and I have not had the opportunity to explore further, is that the object, once scanned in, can be digitally manipulated to alter shape and size or simply created using a digital platform which would allow for the creation of more complex forms than could be made by hand.

*(image 65-67)*

As well as trialling a variety of mandrel materials, there were other trials that investigated suitable electro-conductive coatings and their applications.

*(image 68)*

There followed trials of the electroforming process itself, looking at all the variables of time, current and temperature to provide a smooth surface of the correct thickness to be enamelled. De-lamination, where the metal layers separated when the final form was heated and air pockets formed was one of the problems that needed to be solved.

*(image 69-74)*

In addition to the electroforming trials themselves further investigations were undertaken to consider the best methods for the application of enamel to a three dimensional form, including trials of various adhesives, stiling and firing tests.

*(image 75-76)*

I currently have some of the pieces made as a result of the electroforming research on display at Contemporary Applied Arts in London. Unfortunately I do not yet have good photographic records of these pieces beyond the two images shown here.

One of the main issues with electroforming is that the chemical composition of the solution in the bath is constantly changing in response to ambient temperature, use and the passage of time. Different proportions of additives need to be added to keep the solution in balance. In order to do this accurately the whole process needs to be performed under controlled conditions preferably with a computer-controlled system that collects and collates all the data, where the chemistry is regularly analysed and additives added as required.

At odds with this approach I have consciously designed and built an electroforming set-up that is as simple as possible, one that relies on observable results to keep the solution in balance and that, whilst not cheap, could reasonably be replicated in any enamel studio. As a consequence the trials have been less rigorously scientific than would be the case where the equipment is more sophisticated, but this does have the advantage that it more realistically reflects how the system would be run in a studio environment, and is therefore more relevant to the individual practitioner.

There will be an opportunity to see the equipment and samples I have been discussing and a chance to ask any questions you have in the studio just before lunch.

Early on in the project someone suggested that whilst this was a practice-based project it was sensible to keep a clear separation between the practical research and my own studio practice. This has proved to be good advice as I think the level of scrutiny to which I had to subject every stage of the process would have made the whole making process frustratingly slow if finished work had been the goal. In the end, although there is finished work as an outcome of this project I would consider this work to be sampling.

*(image 77-88)*

In line with the advice I have continued to make the body of work based on text and mark-making that I have been working on for the past four years. This work includes both jewellery and larger scale pieces which often use delicate and barely legible veils of words to serve as a metaphor for the fragility of memory. In both my jewellery and my larger work I strive to create work that has a tactile delicacy and that rewards the wearers close attention with an intricate and detailed surface. I use etching techniques to create delicate layers of barely legible handwritten text and repeated marks that reference handwriting practice. These etched pieces are often made up of multiple layers with overlays of monochrome mark or text uppermost allowing for glimpses of underlying enamel in bright jewel-like colours. By being partially concealed and protected the underlying colour is imbued with a preciousness and intimacy that it might not have if more boldly displayed.

*(image 89)*

Come September when the project is complete I anticipate that I will have the opportunity to build upon the knowledge I have gained during the last three years to develop a body of more personal work which brings together these two strands of practice; the personal work

and the research. It will be good to have time to reflect on all aspects of the research and I hope to be in a position to share much of the knowledge and skills I have gained.  
Thank you.