

Beijing 2025
Surface Landing
Stephen Bottomley Beijing 2025

Introduction

1

My name is Professor Stephen Bottomley. It is a great pleasure to be here today.

Thank you to the Beijing International Enamel Art Creation and Exchange Exhibition members, for this kind invitation.

I am a designer-maker, a craftsman and a curator and I work at the Glasgow School of Art as the Head of the School of Design, which is in Scotland in the United Kingdom.

(2)

I will begin by telling you a little about Glasgow School of Art, established in 1845, and the city of Glasgow.

Glasgow is the largest city in Scotland, the fourth largest in the UK with a population of around 650,000. Located on the banks of the River Clyde It is famous for its Victorian and Art Nouveau architecture, a rich legacy of the city's 18th–20th-century prosperity primarily due to trade and shipbuilding.

Named a European Capital of Culture in 1990, a UNESCO City of music (2008) and a learning City in 2024, it is notable for its architecture, culture, and its warm and friendly people.

A city saying is that the “people make Glasgow” and they are the heart of the cities humour and pride.

(3)

Spanning a 30-year career I have worked at several key UK Art and Design institutions, each with strong historic links to Jewellery and Silversmithing, (my core specialist area).

Before joining the Glasgow School of Art in 2022, I was Head of School of Jewellery at Birmingham City University (2017-22). Previously I was Head of a Department of Jewellery and Silversmithing at Edinburgh College of Art/ University of Edinburgh (2008-17) and Course leader of Metalwork and Jewellery at Sheffield Hallam University (2004-2008).

So, I have had the privilege of working across the United Kingdom in some of its oldest institutions that emerged from the Arts and Crafts movements of the 19th Century as Municipal Schools, all of whom had enamelling then as key parts of their curriculums.

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Edith Nelson Dawson, wrote of enamelling and its significance in her 1906 book on Enamels
‘Enamelling must be taken seriously; it entails work of both mind and body.

As for it becoming once more a living thing in our midst, as it was in old times, one can hardly believe it possible that, in these days of rush and hurry, this gentle little art could revive to so great a distinction.’

(4)

My own practice has been enriched when I have been afforded the opportunity to see my work from another’s perspective and through the lens of another’s knowledge. Schön describes a framing design process “when a practitioner becomes aware of his frames, he also becomes aware of the possibility for alternate ways of framing the reality of his practice.”

These images of some of my back catalogue of work reflects my interest in a range of materials, structures and forms. These include objects that move with the body, articulating as they inhabit their temporary landscapes through riveted and hinged units (Fan Brooch 1988 and Helix Bangle 1990) and surfaces explored through embossed and enamelled textures.

(5)

The title of my talk, “**Surface Landing**”, translates as a controlled touchdown or landing onto an unfamiliar surface, such as a planet, celestial body, but I use it in the wider context of unfamiliar landscapes of craft. So here we go 3,2,1 blast off!

(6)

Born in 1967, two years before the Apollo 11 moon landing – I grew up in the era following the ‘Race for Space’ and space age has remained a constant cultural influence on my craft augmented with digital design and manufacture.

As a Designer and a Maker, I am inspired by the scientific evolution of materials that are available to us as contemporary makers to explore, and excited by how science and technology extend Craft’s practice, including the art of enamelling.

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It is said “Science enable exploration; Exploration Enable Science”

But truly it is

Creativity + Science enable exploration; Exploration Enable Science + **Creativity**

(7)

Elizabeth Turrell has been a highly influential figure in my career. When I first met Elizabeth at the start of the new millennium she was directing the enamel studio as the Centre for Fine Print Research in Bristol, and is one of the UKs leading experts on vitreous enamel. Trained as a ceramicist, she understands the fire arts of ceramics, glass and metal that all have a shared use of kilns.

Elizabeth also has an amazing breadth of knowledge and signposted me to manufacturers and how they work with the same medium, but on very different scales. She would always explain what enamel was, not assuming an audience would necessarily know. So in homage to her work I follow her example here today.

“Vitreous enamel is also known as porcelain enamel or glass metal.

This metal/ceramic/glass combination allows the end product to share the best properties of each material. It offers the possibilities of metal combined with a glassy, corrosion resistant skin that is fireproof. This material used since ancient times is still evolving and developing with the advent of new technologies and challenges”. E.Turrell 2022

Vitreous enamel is made by smelting naturally occurring minerals, such as raw silica, feldspar, borax, soda ash, and sodium fluoride . Ceramic enamel frits contain finely ground glass mixed with inorganic pigments to produce a desired colour.

(8)

Vitreous enamel has been used by artisans for at least 4000 years.

As just mentioned, it’s base ceramic constituents, glassy flints and silica sand.

(9)

The inclusion of metals to the ceramic and glass through fire and fusion create an alloy that shares the properties of all its constituent parts as well as fundamental geological precedents.

(10)

Ceramic enamel frits contain finely ground glass mixed with inorganic pigments to produce a desired colour. Pictured are examples of Galettes of enamel from the 1860s, these are the poured and cooled discs of the mixed recipe, that can be later broken to grind into enamel power.

Colour is made by the additions of metallic oxides and salts e.g.: blue - cobalt oxide, and arsenic, yellow - antimony acid and silver oxides, green - cupric oxides, chromium oxides, red - gold chloride, cuprous oxide, purple - cobalt oxide and manganese dioxide, black, combination of ferric, chromium, cobalt, and cupric oxides, brown - ferric chloride, manganese carbonate.

(11)

Jewellery enamels for sifting or wet packing

Top Image: Industrial or wet-process enamel - application can be by spraying, pouring or brushing

Bottom Image: Enamel 'frits' before the milling process to create wet process/industrial or slip enamel

(12)

19th century recipe for flux (clear glass) for copper and gold that is melted together in the crucible. That you can see being lifted from the furnaces 'glory hole'.

4 parts silica, 6 parts minimum, 12 parts nitrate of potash, or 4 parts optical glass, 3 parts minimum, 6 parts nitrates of potash

(13)

In these short video taken in 2018 in Stoke at Milton Bridge' one of the UKs best enamel manufactures. We had just arrived at the factory for a visit from Birmingham. Here you can see the magical moment this molten alloyed mixture is poured from the crucible onto cold steel to create a disk, that could have been poured as a Gallette, but here is broken into lump for grinding as powder in the factory. Here Milton bridge are pouring an expensive order of red transparent enamel for a customer in India, expensive as Gold is the metal that gives red enamel its colour in this mixture.

(14)

This Dutch 17th Century print shows enamelling as is one of the 'Fire Arts' sharing a close relationship with ceramics and glass. Enamel possesses a luminous hard wearing and durable material qualities that make it easy to clean and ideal for a range of both small- and large-scale applications.

The technologies to produce this material have of course evolved over time as this later 18th century kiln illustration from Encyclopaedia of Trades and Industry 1763

(15)

These wonderful photographs capture artisans utilising the materials for their art.

The image of Ernestine Mills, an Arts and Craft artist and suffragette (1871-1959) shows her in a protective mask to protect her face from the heat and goggles from the light of the kiln.

'Enamelling must be taken seriously; it entails work of both mind and body.

As for it becoming once more a living thing in our midst, as it was in old times, one can hardly believe it possible that, in these days of rush and hurry, this gentle little art could revive to so great a distinction. '

Edith Nelson Dawson, Enamels, p.197 1906

(16)

Kiln design continued to progress with available fuels, to resemble more closely what we are familiar with in our studios today

(17)

A craft heritage material, enamel has many positive attributes and is used for a wide range of applications, from the decorative arts, to cookware, baths, signage and architectural cladding.

Enamel is a permanent material normally perceived as bonded to a metal; it can be transparent, opaque or opalescent. Its colour will not fade, its surfaces can be glossy and brilliant, or matt and textured. This makes it a wonderful material for industry.

This video was taken in Stoke, at Milton Bridge enamels, in the West Midlands in 2019

(18)

There have been amazing applications of industrial enamel.

After the 2nd world war, Lustron Homes were pre-fabricated house, made of steel coated with porcelain enamel, and manufactured like cars and transported across the USA for quick assembly.

(19)

Enamel art was also being created on a large scale. The enamel paintings of Polish born artist Stefan Knapp (1921-1996), who escaped relocated to the Britain during the second world war, was often on a monumental scale – with panels many meters long.

This research by one of my distance-based PhD students working in Gdansk Poland, Catia Weslowska, gives attention to the preservation of paintings made of enamel on steel as an artistic form of expression, The study engages with the concept of conservation and preservation of materials and original location.

Provoked by the negligent displacement, destruction or dispersion of site-specific enamel on metal paintings her thesis contributes to the problem by establishing a conservation protocol defined by the nature of the works of art, the artist's original intention regarding location and the social impact after the destruction or removal of the work.

As you will notice- Knapp was an excellent publicist and often wore Skis to work on his large-scale steel panels when applying his enamels with mops and buckets of vitreous liquid enamels.

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(20)

Three images of large-scale enamel installations

1. 1973 Olstyzn Planetarium, Poland, Stephan Knapp
2. 2022 Kings Cross signage, A J Wells Ltd
3. Edgware road, Jacqui Poncelet, textile designer, 1.8 x 1.2 metres, produced by A J Wells

(21)

At an **Art and Industry enamel symposium**, I organized in 2022 at the Glasgow School of Art

We had among the speakers on the day that included Elizabeth Turrell on ZOOM, the

following in person speakers

(left to right)

David Gatrell, Senior Commercial Manager, A J Wells & Sons

Cátia Weslowska, PhD student,

Stephen Bottomley

Yinglong Li , PhD student

Whose excellent PhD research research study focused on innovation in the traditional process of plique-à-jour.

Through the study of different theories and repeated studio practice, this study has put forward a new enamel craft production method and visual language, and expanded the boundaries of plique-à-jour. Yinglong published his PhD in 2023 and now teaches at Guangzhou University.

(22)

I will talk a little more about my Praxis.

“Design is iterative, interactive and a social process best undertaken in real-world situations”

(Schön)

Returning to the beginnings of my own practice and experiments with enamel. These began after studying on my first Masters in the late 1990s at the University of Brighton and an exchange to Rhode Island School of Design, where I had explored Moiré effects involving

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photographic transfers and fine art print etching processes in the transfer of computer screen images to metal.

(23)

A research projects 2004-7 with the Fortuny Museum in Venice had given me access to incredible textiles designs by the artist Mariano Fortuny, that I digitally scanned and modelled to carry over into metal and enamel works

The director, at that time, Sylvio Fuso, wrote in the 2007 catalogue:

“The preservation of the asymmetry of Fortuny’s patterns in the finished jewellery is particularly effective and clever. The effect of the small imperfections on the metal (purposely achieved by Fortuny in his fabrics as a result of great experimentation) permeates it with an almost undetectable sensation that eliminates the possibility of a trivial relation between materials and drawing”

(24)

I worked with a fine metal water-jet cutting company who were used to cutting clock parts and were willing to work at a detailed fine scale, where each element was an abstract shape – with few straight lines or curves. Like nature, for example leaves on a tree, they are not identical or mirrored, the variations are important and organic and achieves a more natural balance.

(25)

I utilised industrial enamel techniques to create larger scale pieces on the lightweight, flexible thin steel sheets.

Yellow Drape Necklace 2008, Steel and enamel, Photograph: John K McGregor

Exhibited Playing with Fire touring enamel exhibition, 2008-10

(26)

Photographic etching was also used to create a stencil for the exhibition’s theatre display light, as well as pieces of metalwork work for the touring Tech-Tile exhibition, 2007/08.

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Industrial enamel techniques to larger scale pieces that involved the scanning of textile designs in Venice at the Fortuny Museum, enlarging them and laser cutting them through thin sheet steel with industrial manufacturers.

(27)

The **Heat Exchange**: international enamel artists group exhibition, curated by Elizabeth Turrell and Beate Gegenwart, toured in the USA, UK, Holland and Germany and to several UK venues. It was conceived as an exchange of enameller and kiln users approaches to their materials.

In 2011 I had brought industrial ground diamond dust from India to pursue workshop tests attempting to fuse it to enamelled surfaces

Enamelled Silver sheet was very resistant to this fusion, resulting in serious 'pinging off' after firing.

(28)

Engineers working for companies like NASA have developed familiar metals with intricate highly uniform structures that allow for the totally even and dependable exchange of heat and energy. This innovation has led to a modern reinvention of familiar base metals like copper through new material science as super-efficient 'heat exchangers', for space rockets and aircraft engines.

My research explored their material properties for craft practices, and what may be achieved with them, in this case, the stable fusion of diamond dust to applied vitreous enamel surfaces on the copper foam.

(29)

The value of the Craftsperson's perspective, and the lens they bring to bear, has been well described by Sennet 2009 in his pragmatic accounts of craft and the depth and value of tacit knowledge acknowledged.

Craft can include heritage skills as well as emerging technologies. Nicholas Cheng writes:

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“In my research, I consider craft as a discipline that is extremely elastic in terms of propositions and positions. Today craft exists in a highly dynamic space I will refer to as the World-wide Workshop- and essential for noticing, caring, mending, and negotiating the complex relationships that individuals and communities have with their socio-political, economic, and natural environment.” (Cheng)

I challenge enamel artists today, as all contemporary artists in the fine arts, to consider the word in which they are expressing their art in and the changing materials they can work with.

(30)

Further examples of works

Black And White Heat Exchanger, 2012, Silver, precious metal, copper, enamel and diamond dust

Moss Brooch, Silver, copper, enamel and rubber. Photos Shannon Tofts

(31)

In 2015 I was working as Head of the Birmingham School of Jewellery and refurbished the enamel studio there, as well as spending more research time in Bristol

Black and White Traces

Red & black Traces 2015 Steel, enamel, rubber and steel. Photo Shannon Tofts

(32)

FERROcity was an exhibition of enamel art I co-curated by myself with Elizabeth Turrell, then as visiting Professor at the School of Jewellery and exhibited the work of twenty-two contemporary jewellery artists. Jewellery and objects by twenty-two contemporary makers (11 from the School of Jewellery and 11 invited international artists)

Displayed alongside gemmological samples and photography that explores the interpretation and influence of Iron as catalyst, material and fundamental element of life]

Each answered a call at the end of 2018 to respond to one common element, iron and for works to be shown within the Bavaria state mineral collections, München, during International Jewellery Week, 2019.

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The show was exhibited at Birmingham School of Jewellery, Beijing Institute of Fashion and Technology and AIVA Shanghai

(33)

Turrell's 'Widget' brooches are made from rusty pieces found in scrap yards in Germany and the United States.

The 'Watcher' badges are made from enamelled recycled stainless-steel watch backs.

Reversed and pinned in an elevated position they are now too able to see. The enamel technique is a combination of liquid enamel dipping, sifting and ceramic transfer.

While iron is a necessary mineral for many of the body's functions, including sight, too much iron can be toxic. The recycled steel watch cases are enamel badges depicting the human eye. The eye's symbolism appears throughout the history of art is "a ward from evil, a symbol of surveillance or simply a symbol of a shared humanity".

(34)

Another artist to use enamel in the exhibition was the Australian artist and RMIT academic Dr Kirsten Haydon. Her 'Studies of Sand : Iron scapes' series of brooches incorporate black iron sand from the Taranaki region of New Zealand. The iron sand formed by volcanic activity 2.5 million years ago creates the black-on-black enamelled images of beach landscapes and as silica were happily fired into the enamel.

(35)

My latest works embrace the disruption of applying traditional craft technologies to Space Age synthetic materials, for which they were not invented or intended.

The work was shown alongside the touring exhibition 'Moon Impact' while in Munich at the State Mineral museum where I had an aligned exhibition 'Satellite'. It was a great privilege to work again with geologists, as I explore and extend the material choices that I work with. The Earth formed over 4.6 billion years ago out of a mixture of dust and gas around the young sun. It grew larger due to countless collisions between dust particles, asteroids, and other growing planets, including one last giant impact that threw enough rock, gas, and dust into space to form the moon.

(36)

Two popular materials of our Anthropocene era are:

Silicon Discs

Silicon is one of the most common elements on Earth, making up 90% of the Earth's crust. Beach sand is largely silicon and the main constituent of glass production and crucial to the electronics industry. These silica discs are produced by melting silicon powder into cylindrical ingots. These are then sliced into wafer like discs that can be later printed with rectangular circuits by robots in vacuum laboratory conditions. These discs I work with are made in Munich, Germany for semi-conductors and part of a worldwide chip industry (worth an estimated \$500 billion).

Aluminium is the third most common chemical element on our planet after oxygen and silicon. A silvery-white metal it is the 13th element in the periodic table, binding easily with other elements, but pure aluminium does not occur in nature which is why it was not produced on an industrial scale until 1856 and exceeded the price of gold in the 19th century.

(37)

The 'Collider(s)', consist of silicon discs, enamelled, and attached to frames of sintered Aluminium.

The silicon discs are scientifically grown for the electronics industry, not the metal the enamel technique was developed and intended for.

The ground enamel dust is sieved as particles of vitreous enamel, bombarding the silicon disc. These scattered particles of ground enamel when fired at 900 degrees either fuse and bond or resist to spring away leaving only their starry marks of passage. The resulting surface reflects both a successful fusion of enamel particles, as well as the motes and traces of those rejected as part of the tension of this process

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(38)

"Look beneath the surface; let not the several quality of a thing nor its worth escape thee" was a quote from the Roman Emperor Marcus Aurelius 170AD. This general and philosopher simply asked we not take things for granted but looked deeper and questioned what we saw.

Good advice to any Artist, Scientist, Engineer or Teacher.

Wise words in an increasingly fast changing world, at a time of AI when we can not always trust our own eyes and the materials of our planet may soon no longer support its population, and we seek new planets to explore as our future environment becomes increasingly more challenging.

Thank you for listening to my talk and the help of my translator.