

History of the Blacksmith



Submitted to

Hereford college of Arts

In partial fulfilment of the requirements for the degree of

BA (Hons) Artist Blacksmithing

February 2013

Validated by the University of Wales

Full word count: 6948

Edited word count: 6008

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Introduction

In this dissertation I will take an overview of the role of the blacksmith from pre-industrial times charting the changing nature of the profession, what has been gained and what has been lost. In particular I will look at how craft skills, although on a much reduced level, have managed to maintain significance and how the client has changed from a personal contact to a more corporate proposal.

Blacksmithing in Britain is a very old craft with a long history dating back to the start of the Iron Age. From simple beginnings using stone tools man heated ore to produce knives and scrapers. Helped by advances in charcoal making and burning, smiths became increasingly important members of towns and villages. After the development in farming brought to Britain by the Romans (around 400AD) a thriving industry existed making agricultural implements and weapons.

Technological advances in the medieval period with water power resulted in an increased production of iron. Large quantities of cast iron were produced with the development of the blast furnace. Most of this was converted to wrought iron until Henry Bessemer in 1855 started to produce steel furnaces more cheaply and effectively. When mechanisation replaced manual labour during the Industrial Revolution, cast and wrought iron were used in making of the same machines that were the downfall of hand crafted Iron work.

By 1975 wrought iron was no longer produced. New materials such as resins and plastics, which were cheap to produce and consistent in performance were used to create many objects previously made and repaired by the Blacksmith.

The former role of the Blacksmith is in question, and yet the craft of hand forging still plays an important, if a little quiet, part in today's society. With mechanisation has come a lack of the individual one off product. Mass produced objects do not meet some people's desire for quality and design, the recent years have shown a greater need to be re-acquainted with the hand made.

Government sponsored regeneration schemes in the 1990's gave opportunities for artist blacksmiths to make a contribution to the cultural improvement of struggling areas of towns and cities in the UK. These were often places with a community based in industry such as steel and coal. The one off commission to celebrate an aspect of the town's history encouraged local pride and renewed an interest in the work of the Blacksmith. More recently the public funding for community commissions has disappeared due to ongoing cuts in all walks of life meaning the opportunities have diminished again.

What then is the role of the blacksmith in the 21st century? This is the question I plan to answer in this essay. By reviewing the historical existence of the Blacksmith and their role within communities I hope to understand if and how blacksmithing is relevant in the 21st Century.

Chapter 1: The Iron Age

The Art of Forging is an ancient process originally dating back to The Bronze Age. Traditionally forging is recognised as the work of the Blacksmith, this tradition must have begun with the discovery and use of Iron, in a time period marked as the 'Iron Age'.

When the Iron Age began depends geographically. In the Ancient near East it's believed to have started around 1300BC in Anatolia. The knowledge reached Greece by 1000BC and spread to the rest of Europe. The discovery was expressed differently according to its vast scope of time and place.

From slow beginnings, primitive man would have heated rocks on a campfire. At some point Iron ore's and their malleable state were discovered. There was mystery surrounding Iron and people believed it to have semi-magical powers, the blacksmith was deemed a sorcerer. It took a long time to evolve; the early iron workers had to understand the necessity in reducing the carbon content and the impurities. They would make iron with a crumbly and brittle nature. Sharper and harder than stone it was first used to form crude implements. Natural progressions occurred in the uses of iron and the skills of the blacksmith would develop.

In around 450BC Iron had spread across Europe and reached Britain. Iron was now comparatively easy to obtain but was high in value. The Romans had a thriving industry making agricultural implements and weapons. It's possible they had a guild of Blacksmiths as iron was an integral part of the empire. They found new uses such as domestic items and ornamental decoration. Other civilizations were also expressing themselves through use of iron. Extraordinary skills by the Longobardes (Northern Italians) created works of Art using gold and silver inlay on forged iron.

Workable Iron was achieved by what is known as the direct method. In Europe the Bloomery furnaces was used from about 500BC to AD 1500. The first stage was the preparation of the Iron ore and Charcoal. They would mine for ores with high iron content. Primarily Haematite was used, it could be found in two forms Anhydrous (red ore) and Limonite (brown ore). The charcoal had to be made and was of huge importance to the iron industry.

Today the Forest of Dean is the last place where regular demonstrations of a traditional forest kiln can be seen. It is built by first making a central chimney structure out of wood. Increasing lengths of wood are then stacked around the chimney then covered with turf. The chimney is then lit from the top and then covered back over. The stack is continuously watched over the course of between three to five days and left to smolder. An experienced charcoal burner could tell from the blue hazy color and smell of the smoke when the burn was complete. The stack would then be quenched and the charcoal collected. The aim is to heat wood with the absence of oxygen leaving charcoal - a form of pure carbon.

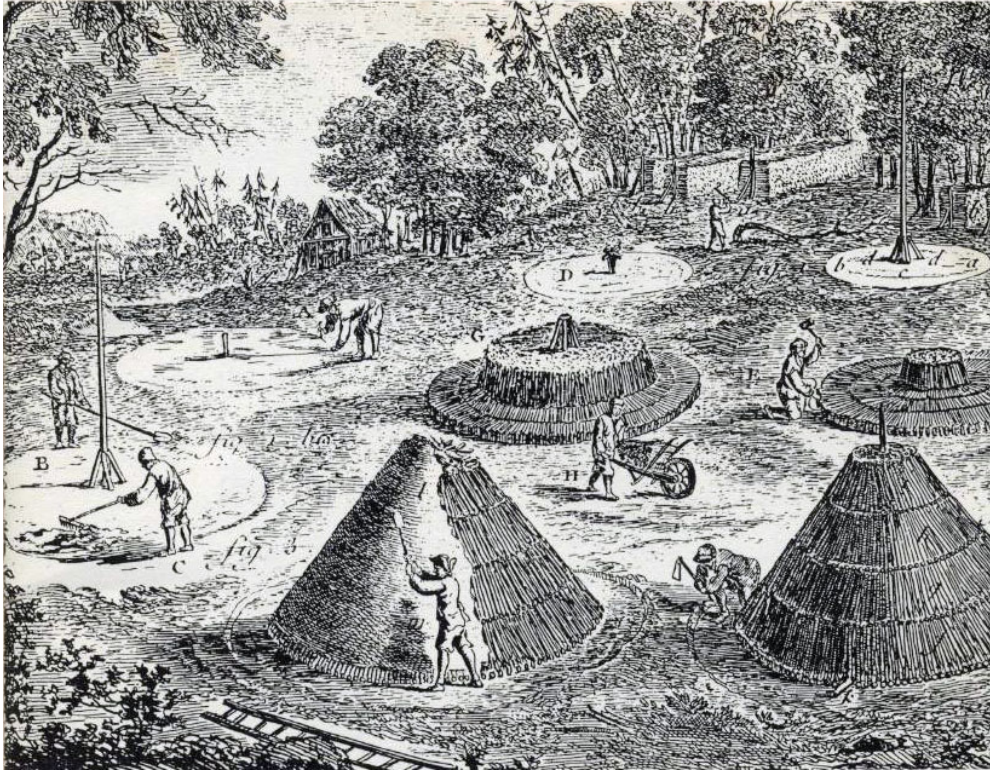


Figure 1

The second stage of iron making was to form the bloom. The process I've used is believed to have been in operation during the English Iron Age. It consisted of a chimney made from fire clay with bellows on opposite sides of the base. In between the bellows there is a blocked door that can be broken open when the bloom is formed. More primitive design was pits dug in the ground or made of stone. The Iron ore and charcoal are then layered up inside the furnace and ignited. The bellows increase the temperature and also help maintain a heat. This is important as the direct method doesn't involve melting the iron; instead tiny Iron particles form a spongy mass known as a bloom. The bloom is then removed from the furnace and taken to a fire welding heat; Hammering is required and at this stage it not only removes impurities but also fuses the billet together, when this is complete wrought iron is formed.

Abbeydale Forge-In, Sheffield

Elsbeth Bennie *photos by Elspeth, Niki Connolly, Sheffield Museums*

We held a very successful forge-in at Abbeydale Industrial Hamlet over the Easter weekend, in conjunction with the 'Something for the Garden' exhibition in the Winter Gardens as part of the Galvanize Sheffield festival. The project for the weekend was to make small panels inspired by the planting in the Winter Gardens, which is a contemporary glasshouse set in the heart of Sheffield. The finished piece will eventually go on permanent display there.

It was a lively event, with over 1000 members of the public visiting over the weekend. The children's forging station proved so popular that we had to send the overflow on to the main forging area, with archeology students and silversmiths involved in other areas of the festival keen to have a go. Sheffield University's archeology department built and ran a small bloomery furnace, eventually producing a small bloom by Sunday. Living history tours promoted the more colourful aspects of the museum's history, and musicians kept us entertained.

The main forging station was set up in the main courtyard, along with tables displaying members' portfolios and small pieces of work, so the blacksmiths got maximum exposure. Local blacksmiths also turned up to give us support, and we would like to thank Andrew Renwick, of Ridgeway Forge, in particular, for bringing along several anvils and other essential pieces of equipment.



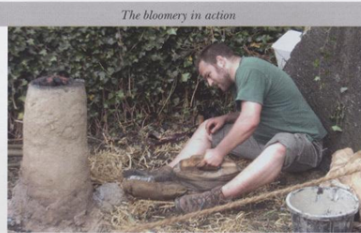
Sara Unwin from Galvanize Sheffield with Nick Pakham



Children's forging area



The bloomery in action



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Figure 2

Blacksmith tongs have been found in Egypt dating back to the Iron Age, The basic design hasn't changed. My tutor Adrian Legge once said that if an ancient Egyptian walked into his forge he would be able to start working because the fundamental process hasn't changed. I believe it is important to understand where we have been to know where we are going.

Chapter 2: The Middle Ages

The Romans had left England's shores in around 400AD and the Iron Industry here became dominated by the monasteries. The work of the Blacksmith in the dark ages was being shaped by religion. This influence would develop as artistically worked iron became a part in the construction of religious monuments.

At this time parallel to the general smiths specialist areas such as farriery; armourer, blade smith, gun smith, chain makers and nail makers existed. Surviving artefacts show another common use in medieval Ironwork was protecting wooden doors and chests. They are characterised through the use of intricate chisel and punch marks for detail on scroll work. A fine example can be seen on the hinges that were designed for Notre Dame Cathedral in Paris. They are now preserved in the Musee de Cluny, Paris, as they were replicated and replaced in the nineteenth century.

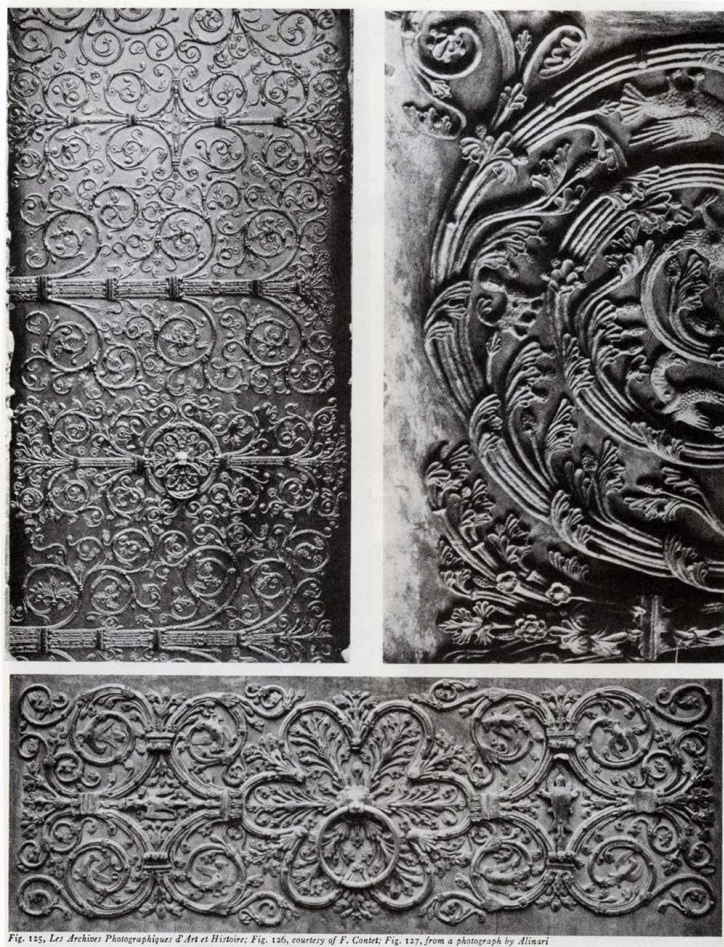


Figure 3

Blacksmithing was in its prime forging their own institution, the worshipful company of blacksmiths was formed in 1299 and the worshipful company of farriery in 1356.

The forging process was well on its way to being mechanised. Major technological advancement was made with the use of water power. Large blooms could now be refined

under a tilt hammer. Tricky operations such as crushing iron ore were made easy by the grindstones; even the bellows became water driven.

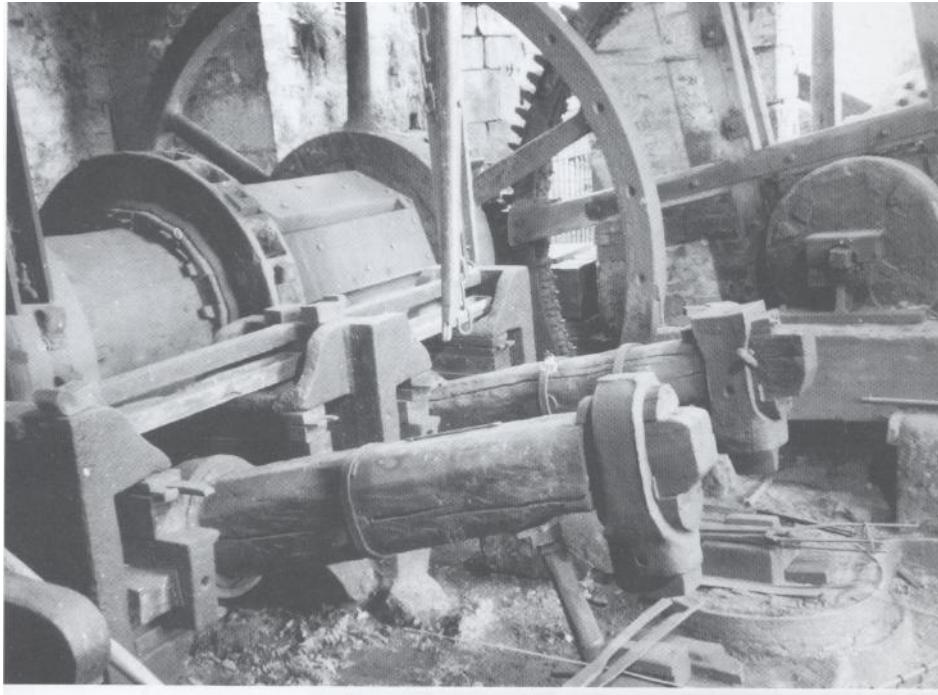


Figure 4

Scale and production had also increased and iron making had to meet new demands. Larger furnaces that could produce greater amounts of Iron were being explored. Significantly the Catalan forge perfected in northern Spain demonstrated the advantage of a taller furnace. Then towards the end of the thirteenth century The "Stuckofen" started to appear in Germany. The furnace revolutionised the process as the real availability of workable iron in quantity was achieved. It could produce 700 pounds of metal per heat and reached heights of sixteen feet tall. Even then more and more changes were added which lead to the advancement of the indirect smelting method and the medieval blast furnace.

The first stage of the blast furnace was to produce 'pig Iron'. Blasting charcoal with compressed air from huge bellows would melt the Iron ore inside the furnace. It's was then tapped and the molten metal is allowed to flow out into shallow trenches shaped in a sand box. The trenches gave Pig Iron its name bearing a resemblance of a sow suckling her litter.

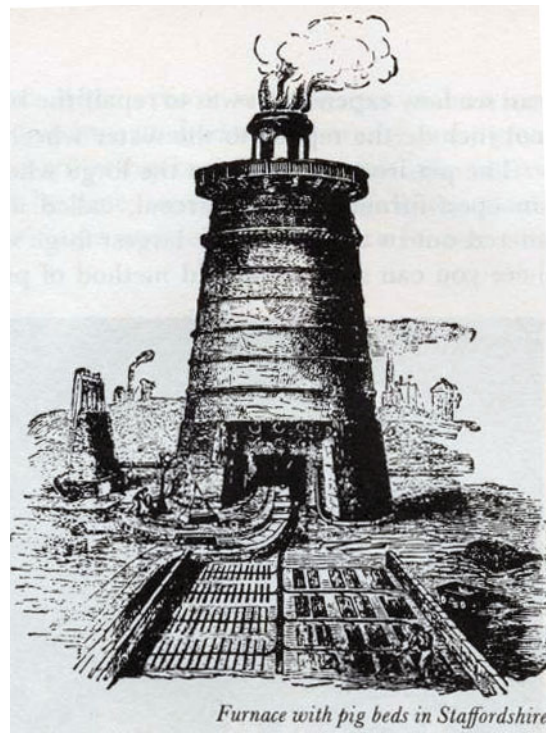


Figure 5

When solid the pig iron was very brittle from the amount of carbon absorbed from the charcoal. The second stage was to break the pig iron up into manageable sections and take it for re-work. Wrought Iron could be produced in a 'Finery Forge' where the pig iron would be melted a second time and refined under a tilt hammer. Also new to the market was cast iron, which was fashioned by re-melted pig-iron and mixing it with scrap iron. At first they found little use for the new material and so it was re-worked into wrought. Only cannon balls and cannon barrels were cast at the early stage.

By the late middle age (fourteenth - fifteenth century) Blacksmithing was a highly respected craft and was being embraced by Italian architects and designers. Renaissance design often beautiful and ornate became adopted in ironwork. The Palazzo Strozzi is a palace in Florence, Italy. The Ironwork was forged in 1490 designed by Benedetto Majano and Simone del Pollaiuolo two famous Renaissance architects. Nicolo Grosso was the master blacksmith who had worked the iron for the palace, he was considered to be on an artistic par with the architects.

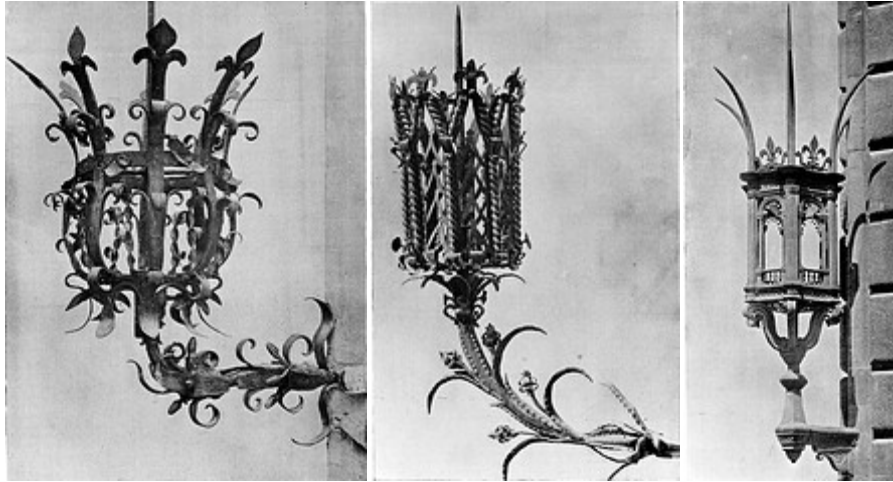


Figure 6

The Gothic style was the old fashion, though it continued in certain places up to the sixteenth century. Following the renaissance was the Baroque, Rococo, and Neo-classical periods. Many original works in these styles exist today and in some places they still practised. At the time it was a golden age for the Blacksmith and really represents the pinnacle of wrought iron. It was now produced with 0.4% carbon content making it very soft and easy to work, it could be shaped into fine details with great intricacy.

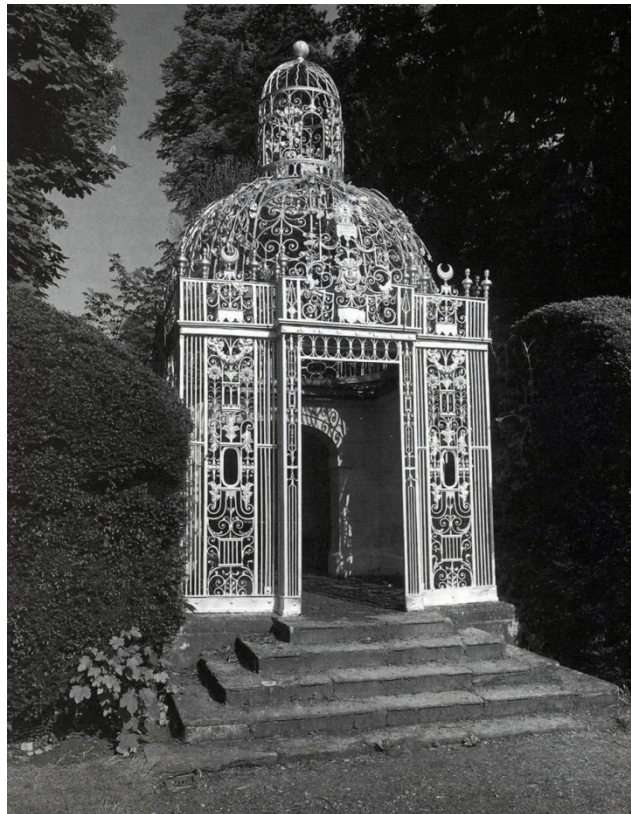


Figure 7

In Spain huge Rijas (screens) up to 9 metres high live in their churches and cathedrals. They were highly decorative with silver and gilding often applied to enhance the rich aesthetic. Cold carving is almost unheard of today but was quite sort after back then; the tricky laborious technique was popular in Spain and used to embellish the balusters.



Figure 8

In France architectural Iron Work blossomed. The ruler King Louis XIII was an armature smith himself and had forges built for his palaces in Paris for the royal blacksmith Rossignol. Symmetrical scrollwork and repousse became a theme for the Blacksmiths as decorative Ironwork was in demand. Gateways, balconies and stair railings were required for the new

palaces and mansions being built. A prime example is the Palace of Versailles in France, home to the most notable ironwork of seventeenth century.



Figure 9

The work of Jean Tijou set the standard for blacksmithing in England and he is regarded as the greatest Iron worker of the eighteenth century. Although not much is known about him it is thought he trained at Versailles. He was then brought over to England by William III to create screens and gates for Hampton Court. The aim was to compete with the palaces of Europe and they would need the best designers and craftsmen out there. Jean Tijou had evolved the Baroque style and brought with him a new technique called repousse. His work reached the absolute limit and elevated Blacksmithing to a Fine Art. Most of the work at Hampton court is still the original; a few sections are displayed at the Victoria and Albert Museum. He continued to operate in England working on St. Paul's Cathedral for the Leading Architect Sir Christopher Wren.

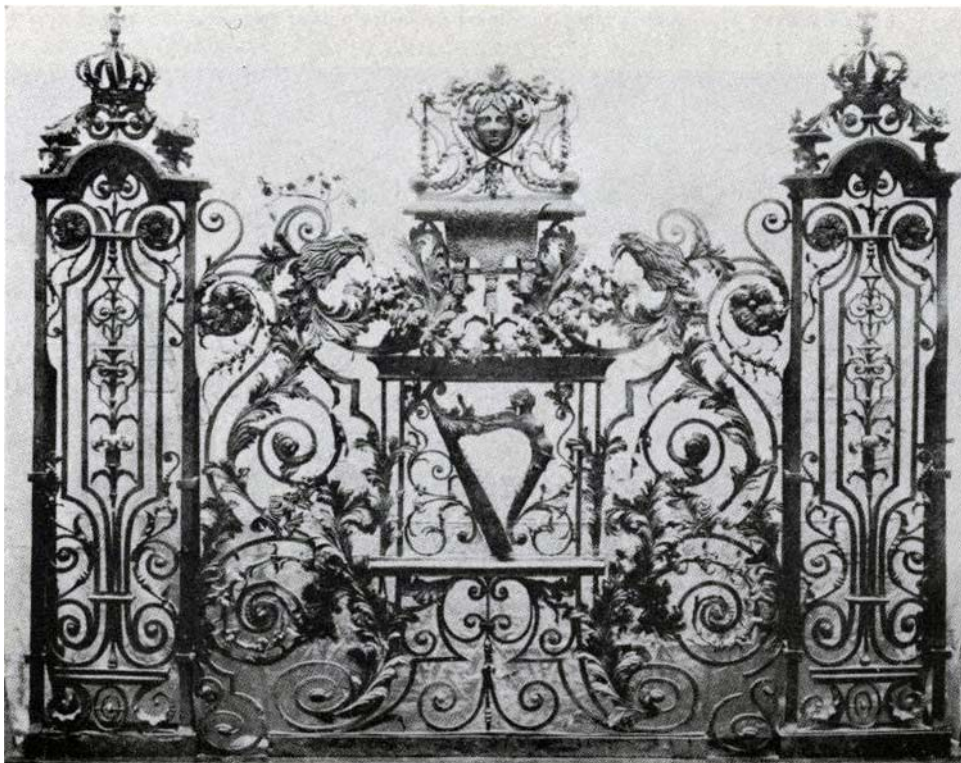


Figure 10

Large commissions at this time would have granted the Blacksmith an opportunity to really push the craft. With this high standard and established repertoire the mystery and magic that once surrounded the craft was gone and had evolved. From crude iron ore to advanced artistry and craftsmanship what could possibly be next?

Chapter 3: The Industrial Revolution

Cast Iron started being mass produced for architectural uses such as gates and railings. The foundries began to blossom as it was cheaper and less laborious to cast objects than have them wrought. The classical period was also changing and for the blacksmith it was relatively stagnant. The Neoclassicism style was opposed to highly ornate ironwork, simplicity and straight lines would dictate the new design. The blacksmiths requirement was to replicate the linear drawings devised by the designer and for the first time the Artist in iron was out dated.

In Britain charcoal making was having devastating effects on the woodlands and problems occurred when the demand for fuel increased. Abraham Darby was the first person to make cast iron using a coke fired blast furnace at his foundry in Iron Bridge 1709. His breakthrough would lead to coke becoming a replacement fuel for the iron industries. Producing coke involved a similar process two charcoaling wood, coal heaps were light reducing the impurities and driving of the sulphur the end product is coke, dark grey in colour with high carbon content with few impurities. The problem with smelting using coal was it made the Iron 'cold short' (brittle at a low temperature) this was because of the sulphur content.

The new fuel was used in Henry Cort's invention 'Puddling' which would replace the charcoal fuelled Finery forge. In this process a reverberatory furnace was used to convert pig iron into wrought iron. Molten pig iron in a bowl would be constantly stirred or puddled by workers with long iron rods. The design of the furnace draws the hot gases from the fire over the bowl of molten pig iron and up the chimney. The reaction de-carburizes and removes the impurities leaving wrought Iron.

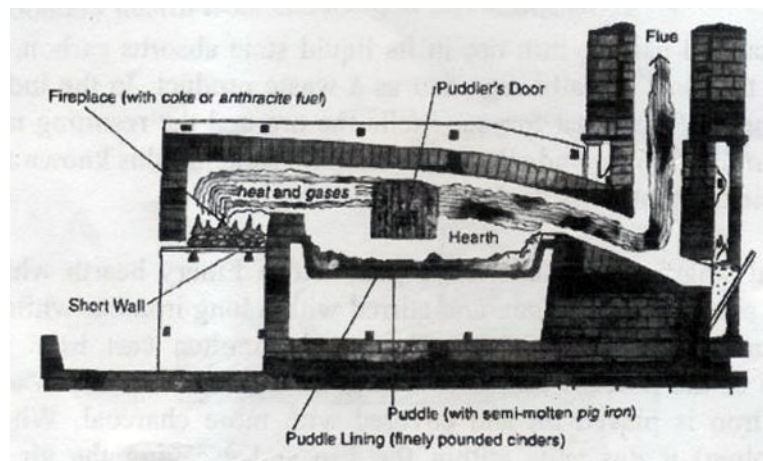


Figure 11

The lumps of wrought iron are then carted over to a power hammer to be drawn out. Once forged down to an adequate size the Iron would be fed through the rolling mill. Henry Cort had also made alterations to this process; the earlier version was called a slitting mill used in England around the 1590s. It had been water powered and would first flatten the Iron and then cut the sheet into strips by running it into revolving cutting discs. The problem was that they couldn't keep the heat in the Iron allowing it to be worked. Cort's adaption made a great

difference, to keep the heat he invested his time in making the design more efficient. His method involved cast Iron rollers with various sized swages, after hammering the iron it would be fed into rollers and grabbed with tongs on the other side. The process was speeded up by being able to pass the bar back through on a third roller. The swages would be used to determine the size of the stock required. Most 19th century applications of wrought iron, including the Eiffel Tower and the original framework of the Statue of Liberty used puddled iron.

This was a time of Ingenuity and invention starting in Britain, mining, technology, manufacturing and transportation, caused fundamental changes to the cultural and economic state of the country. The developments in the iron and coal industry are undeniably key inventions which triggered the Industrial revolution.



Figure 12

Steam power would become the most revolutionary development yet. The Industries located on the rivers had been dependent on waterpower. The steam engine meant they could now relocate, in the iron industry the furnaces could now be placed close to coal mines making the source much more obtainable and efficient. The use of steam power in the textiles factories had made Britain the greatest economy in the world. Locomotives allowed people to move goods at a rapid rate and over vast distance.

Blacksmithing and forging were used in a great range of Industrial activity. 'Big Pit' is a National Coal Mining museum situated in Blaenavon south Wales; here you can see a blacksmiths' yard that has been maintained since 1870s. A forge would be essential for working collieries of this scale. The blacksmith became an engineer for, machinery parts, pulley systems, drums, rail junctions and pipes. All manner of objects could be made from a simple sketch. General tasks involved making and maintaining tools and also farriery. At Blaenavon there were working horses (pit ponies) kept underground, the shoes would be made in the forged to fit each individual hoof and then taken and shod in the mines stables.

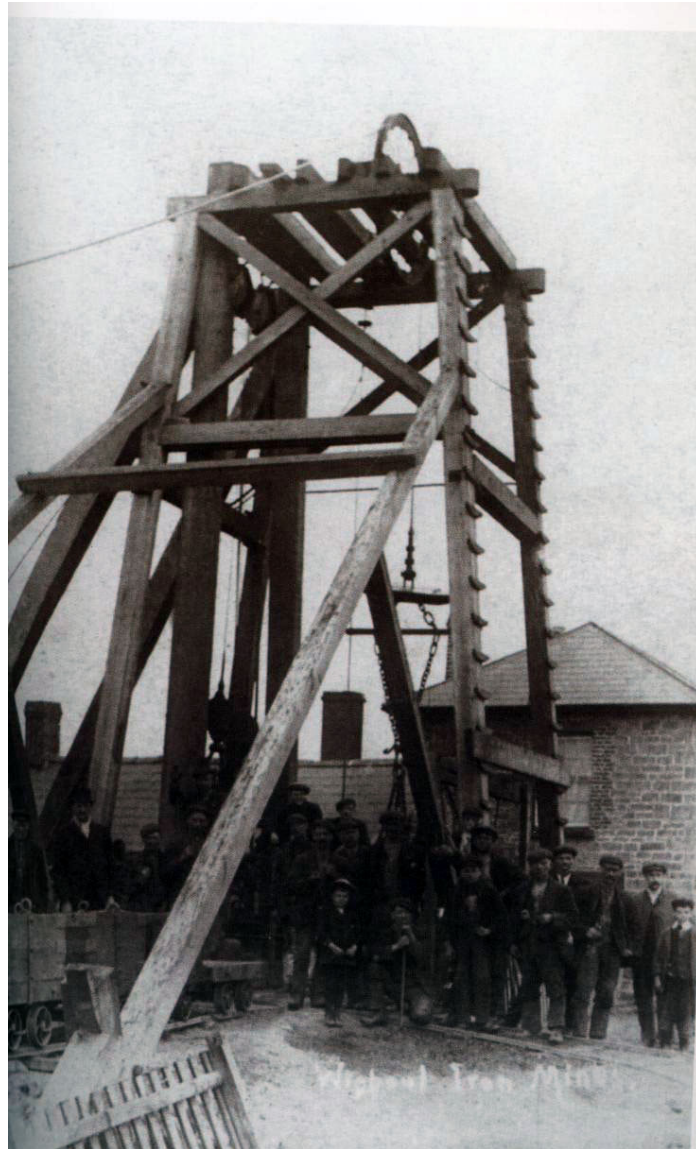


Figure 13

The work for the blacksmith recorded in north Wales at The National Slate Museum in Llanberis and the Llechwedd Slate Caverns in Blaenau Ffestiniog differ slightly. Blacksmithing in a sense is quite diverse because of the endless possibilities of forged Iron, It's Interesting to see how different industries utilized its qualities. The slate workings in Llanberis are also a good example of how self-sufficient the industry's had become for the

use of iron. The workshops necessary to produce metal objects for quarrying were built on site consisting of a saw mill, pattern loft, foundry, machine workshop, forge and tinsmiths. The work fabricated by the blacksmiths involved a very high standard of craftsmanship. Components produced in the other workshops came to the forge to be assembled often being riveted together. Operations such as making boilers, axles, wheels, and sprockets were performed. Different tooling was required for the quarrymen; the blacksmith would temper them to meet the needs for different kinds of rock.



Figure 14

Even more far afield was the ship building industry. Isambard Kingdom Brunel made work for the Industrial Blacksmiths by pushing the limits in construction. Brunel realised the limitation of the tilt hammer when designing the paddle shaft for his SS Great Britain. Tilt hammers and helve hammers move on a pivot, something this large would interfere with the motion. His paddle shaft would need to pass through the hammer and required vertical blows with plenty of room to fall. It was James Hall Nasmyth who solved the problem; the Scottish engineer became famous for his invention of the steam hammer. The Hammer revolutionized the processes in large scale forging; components like anchors could now be hammered out of one section instead of forge welding billets together.

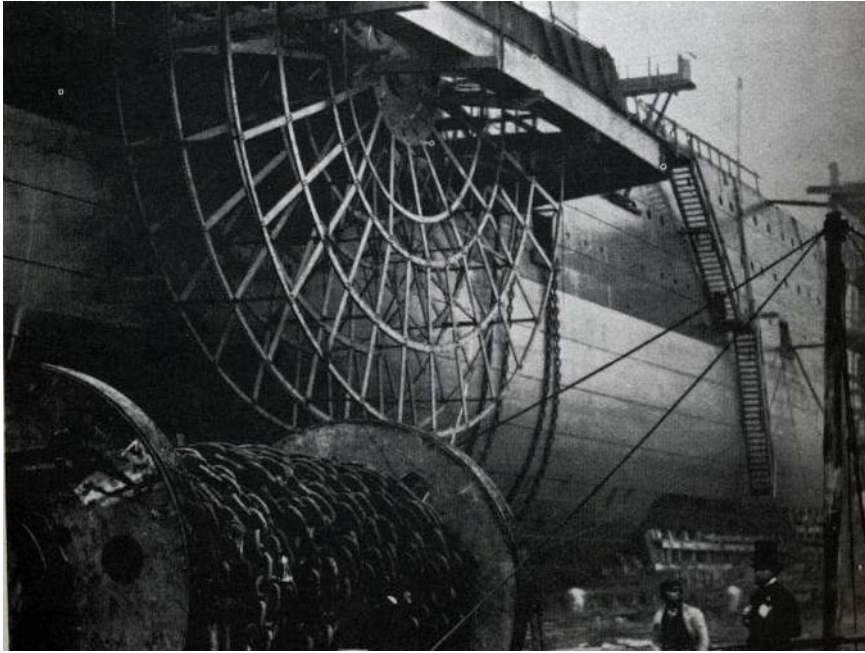


Figure 15

The SS Great Britain was the first Iron steam ship to sail the Atlantic and can be seen in Bristol docks. It was made entirely of wrought Iron; the plates were riveted together forming a water tight seal. This job was given to teams of men known as rivet gangs or bashers, fierce competition was evoked within the gangs to make them work as fast as possible. They were paid based on the amount of work they could do in a day regardless of time, this is known as piecework. It was hard dangerous work with a terrible wage; this was the case for most jobs during the industrial revolution. When working at a height the rivets were heated on the forge and thrown up, the workers had to catch them and bang them in before they lost the heat. Many children were employed as they could fit in-between small gabs, they too would handle the white hot rivets.

Similar jobs to riveting was chain making. Famous for the industry was in the west midlands which became known as the Black Country. The early days of nail making was also preformed here but was short lived being mechanized way before chain making. The both trades were relatively small in comparison to iron making, engineering and mining but this illustrates the wide use of forging. Large workshops for the manufacturing of chain cables were of great importance to the shipping industry. They gained an international reputation and made some of the biggest chains in the world.; the double bick anvil was designed to support large links whilst being shut ,this often required a chain maker a chain smith a four or five other men swinging hammers with two handles. Smaller scale operations like chain shops or one-hearth workshops in the garden were worked in by men and women. Specialized tools and techniques were very individualistic in this trade. The Tommy was a treadle operated hammer used to shut the links and finish them. They worked at small stations that had all the tooling to make the job as efficient as possible. The Black Country Living Museum, Mushroom Green Chain Shop and Avon croft are now home to this specialist process.

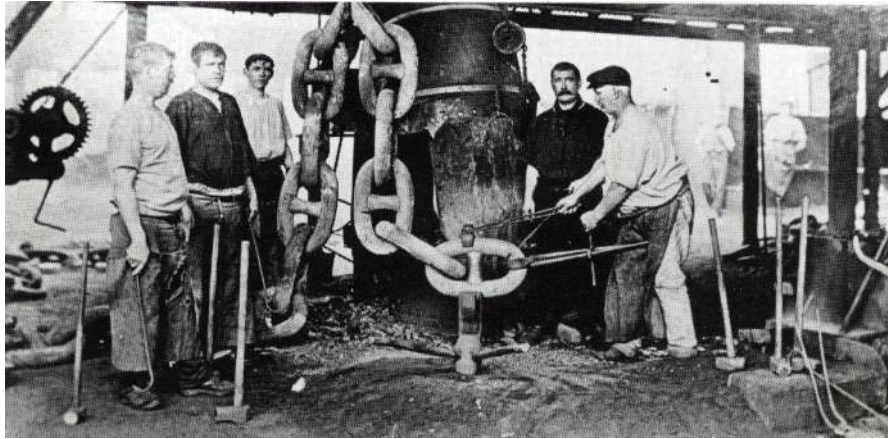


Figure 16

The next giant leap in the Iron Industry was the rise of Mild steel. Different properties can be applied to Iron, commonly known as steel making; in effect steel is an alloy of Iron and other elements. Wootz steel and Damascus steel are ancient knowledge. Billets of Wootz or Damascus would be fire welded into wrought iron to give the material toughness and durability. It could then have various heat treatments, processes in which the steel can be hardened and tempered altering the materials properties for its intended use.

Sheffield became known as the ‘Steel City’ and had internationally reputation. Many innovations such as ‘staybright steel’ and its leading designs in cutlery, silver ware and edge tools made it world famous. The fast flowing river don and Local resources were a huge advantage to its development during the middle ages. Abbey dale industrial hamlet was one of the largest water-powered sites on the River Sheaf and is now protected as a Heritage site. The original workshops remain functional and give a direct insight to the processes involved in making edge tools. The invention of Crucible steel also came from Sheffield, it was a satisfactory material used for many applications where hardness and durability was required. The steel was made in a crucible furnace and then sent to the forge. Large scythes made of wrought Iron were drawn out under a tilt hammer with the steel forge welded on to provide the cutting edge. This produced a high quality tool but the problem was the steel was expensive and difficult to make.

In 1855 Henry Bessemer patented his method of making steel from pig iron. He had been working on improving Iron production and managed to revolutionise steel manufacturing. When the Bessemer converter was finally complete it could produce mild steel cheaper than puddle wrought iron, it also increased speed and scale of production. The original black metal was being replaced, production ceased in Britain in 1976.

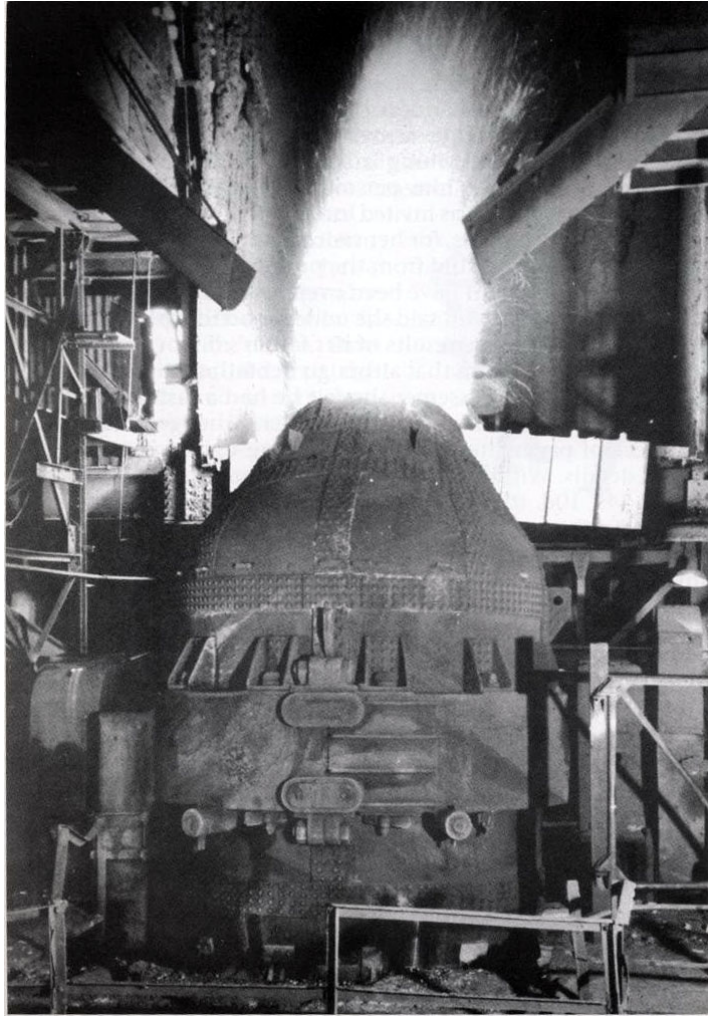


Figure 17

Chapter 4: The Arts And Crafts, Art Nouveau And Art Deco Movements

By the middle of the nineteenth century it was evident throughout Europe that manifestations against Industrialization were at hand. The excessive use of cast iron met the response of decorative wrought iron designed by pioneers inspired by the history of the middle Ages. Gothic and renaissance styles from the forge were displayed by numerous firms at the London International Exhibition In 1862. The world of Architecture took a particular dislike towards industrial methods of production which lead to the Arts and Craft Movement.

Engineering was the Art of the Victorian age; there inventions had changed the world and could be lionized for their breakthroughs. But it is in Art that human nature reacts when physical control becomes distant. People must have felt Impoverished produced decorative art formed soulless work. In a sense the engineers felt that anything could be achieved in metal, with things like the Iron Bridge and the great exhibition it came a time of the golden age. History has a tendency in repeating itself, the height of this industrial art from is reached and then the time for change becomes in motion.

The Arts and Crafts movement began to prosper in Britain by 1860, starting a revival for artistic craftsmanship. In designing the law and courts building in London, William Burges had made heavy use of the medieval aesthetic. This became a fashion and called for ye old blacksmith to produce retro designed candlesticks, fire irons and door knockers etc.



Figure 18

The Art nouveau movement began in 1890 and Wrought Iron became a significant addition to architecture once again. This time we can see the Art form breath new ideas and possibilities. Wrought Iron and cast iron took shape to form decorative sinuous and organic elements in the abstract and flamboyant design. Art Nouveau was New Art at that time and has left us with a

legacy of highly developed style. Many monuments can be seen today and are protected on a world heritage list in order to preserve the cultural importance.

It's now seen as an important transition between Neo-classicalism and Modernism, moving forward out of the nineteenth century into the twentieth. Decorative Ironwork had been through a huge decline, the forges operating in the eighteenth century would never be the same. The Ironwork now was being designed by the Architects and often the craftsmen remained anonymous.

Some of the Artists that are famously recognised for Art Nouveau such as Charles Rennie Mackintosh saw new possibilities for Ironwork in his designs. He was born in Glasgow during the Industrial Revolution and became involved in the Arts and Craft movement. During his career he explored many different approaches to making his work. He became a distinctive figure within Art Nouveau and when designing The Glasgow school of Art he reached an international reputation. His Style was ahead of its time contrasting between decorative organic motifs with strong square corners and subtle curves. The forged work is expressed through imagination and original design.



Figure 19

Brussels is the home of Art Nouveau designed by famous Belgium architects. Arguably the most exciting Wrought Iron work can be seen here. Victor Horta Is a very important figure in this movement. Most notably he designed his own house which is now the 'Musee Horta' Tribute to him for designed everything including the telephone. Elements in his designs really capture the way forged metal can give the impression of soft flowing organic forms. The Stairway of Tassel House gives the notion of movement with the impulse of a striking whip. He was discovering the possibilities for modern metal design but also managed to convert his ideas into stone. When this happened the sinuous and structural forms he applied in masonry were very successful and original compared to the current styles. He found stone to be both structural and sculptural.



Figure 20

Spanish architect Antonio Gaudí connected with Victor Horta's ideas and went on to create some remarkable work. He was born into a world of iron and architecture; it had been a Catalan tradition since the Middle Ages and his father's profession. As an apprentice he learnt in at the Sardà boiler making shop and the Ciré ironworks in Reus. Gaudí was keen to revive old techniques and styles and had no problem applying it to new values. Casa Milà or the La Pedrera (meaning Quarry) gives the impression of being constructed out of soft malleable materials. It doesn't have any kind of symmetry which made it controversial in design. Each balcony is different as they were each improvised in the forge. The Badia brothers had been trained by Gaudí and collaborated with the architect to produce the iron work. He used wrought iron extensively and established new technical processes and experimental design. The gate for Güell Pavilions is a good example of his creativity. The Dragon is constructed through using industrial parts like chain links and springs. It demonstrated an original approach when comparing it to the traditions behind blacksmiths that made the Rijas. Gaudí's Art Nouveau started where his predecessors left off...



Figure 21

Art Nouveau design lost reputation by 1914 in the Great War. Things became more streamline and modern in a sense it disconnecting their bond with tradition. Decorative Iron of any description faced along episode of decline. Mechanical innovation had also mechanised most industrial forging. New welding methods replaced processes like hot riveting and chain making. The military would employ people for farriery work, technically this is not blacksmith but it still combines some forging skills.

In the 1920's Art Deco emerged from the Interwar period. Mechanical power hammers and gas torches were becoming popular and opening new possibilities for blacksmiths. The French Ironworker Edgar Brandt's combined traditional smiting to the rising machine age. He produced a wide range of stylized work from domestic to gates, elevator doors and lamps. His innovative style was displayed in the famous 'Expositon des Arts Decoratifs' in Paris in 1925. The developing interest in Art Deco Ironwork was wide spread. Samuel Yellin was a Polish blacksmith who moved to Philadelphia where he opened a Forge and school of blacksmithing. He embraced the Art Deco style and also historical influenced such as gothic design. America had just started too grown and there were lots of opportunities for decorative Ironwork. At the peak of Yellin's career he employed up to 250 blacksmiths and was

churning out work in a wide range of commissions. His approach to blacksmithing wasn't hindered by the past; he let creativity fuel his design.



Figure 22

Chapter 5: The Twentieth Century

Flourishing Ironwork became stunted yet again as the Second World War became a reality. After that architectural modernism emerged and the classic blacksmithing styles wouldn't be recovering anytime soon. In 1920 the Bauhaus school of Architecture was formed, It would have a huge impact on style and design. Modernism in architecture striped away applied decoration and focuses on minimal and simplified forms. The concept has inspired many influential designers and the style continues to dominate in the twenty first century.

In around 1970 blacksmithing found another angle of approach and the craft was brought out of the shadows again. Work by the Italian master sculptor Toni Benetton was pioneering abstract ironwork. He was a visionary artist and his work demonstrated unique forms that inspired a generation. In Treviso he formed a school of blacksmithing were the core focus was on the exploration of sculpture and Ironwork. His son Simon Benetton followed in his father's footsteps, working alongside him from an early age. The Abstract work created by Toni and Simon Benetton have a distinctive understanding of the important values in sculpture.



Figure 23

Fritz Kuhn's was a master blacksmith and a driving force with architectural Ironwork. The war had destroyed lots of Iron work by tearing it down and converting it to ammunition. The Modernists were adverse to decorative work but ultimately the widespread regeneration schemes showed developing interest. In 1958 at the Brussels world fair Fritz Kuhn's gate triggered the possibilities of Decorative Iron work on modern buildings.



Bundesarchiv, Bild 183-2005-0930-501
Foto: Schwahn, Ernst E. | 1947

Figure 24

The gate was a stepping stone for Artists such as Albert Paley. At that time in America there was a renaissance of handmade craftsmanship, the schools and colleges made creative subjects more accessible and people were becoming more practically minded. Paley had started out as a jewellery student influenced by the times he found his way in to blacksmithing. He is now internationally known for his public art and commissioning. In his insight bridging the gap between modern architecture and Blacksmithing.



Figure 25

Chapter 6: Present Day

Forging is the core element that defines blacksmithing; the process is bound to the manipulation of Iron. It's never purely Art nor is it just functional craft, I'd say it lies somewhere in between. Art in the true sense is not constrained by the practice and understanding of one material. Even forged objects that are intended for a specific practical function will still carry an intrinsic appeal. In effect the work has qualities like no other.

Blacksmithing in the twenty first century is often confused in the public realm. The 18th century as we know was the golden age for ornate Ironwork. Nothing could match the quality coming out of the forge. There was a widespread demand which funded the movement for a highly developed style. Nowadays people who don't know the topic generally have the association that blacksmithing is a dying Art or think that it about shoeing horses. The world has moved on from the values of the 18th century. So although the rich history may appear to be the defining factor of what the subject is this is not the case.

The truth can be seen in the way history repeats itself. After the golden age the blacksmith was stripped of this reputation, the Industrial revolution formed a new sense of the word with the requirements for engineering and construction. Arts and Craft followed by Art Nouveau regenerated blacksmithing subsequently for new uses in architecture. A decline followed during the war years but once again even when it seemed all the odds were against it with Bauhaus and modernism bringing a revival to hand crafts. The subject constantly finds new ways to apply itself.

Today blacksmithing is still relevant because they can create things with mind heart and hand which industry is not able to make by mass-production. There is a wide range of occupations carried out by contemporary smiths. There are a few companies such as Sheffield forge masters that make huge forgings of components for nuclear energy. This heavy industrial use isn't regarded as blacksmithing but is in its origin. Many smiths would be classed as traditionalist's who reproduce work from the classical periods. They may also do restoration work that requires specialist knowledge. There is also scope for the artist blacksmith. This name is now used to help smiths label themselves for a more specific audience. The problem is that it's a hard to give the vast amount of things blacksmiths do a single name that covers it all.

In conclusion of this project I have explored the patterns of the blacksmith and shown in brief the development of the trade. I think that the present day has as much potential for successful smiths as any time in the past. Making truly original and innovative work can be achieved at any point in history. The way blacksmiths apply themselves is another matter, as IV shown in this essay there are and have been a vast amount of different requirements. The public opinion of contemporary blacksmithing can be influenced by good work. A continuing interest could lead to the next revival of the trade.



Figure 26

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The Forest of Dean

The Dean Heritage Centre

Clearwell Caves

Hopewell Colliery

Bristol

SS Great Britain

M Shed

Anglesey & North Wales

Britannia Bridge

Snowdonia National Park

Llanberis National Slate Museum

Devon

Finch Foundry

Greater Manchester

The Lowry

Greater London

Bettersea Power Station
The V&A
The National History Museum

Gwent, Wales

Big Pit National Coal Museum, Blaenavon
Blaenavon Iron Works

Sheffield

Abbeydale Industrial Hamlet
Kelham Island Museum
Wortley Top Forge

Midlands

Black Country Living Museum
Avoncroft

Oxford

Combe Mill

Ironbridge, Telford

Blist Hill Victorian Town
Tar Tunnel
Ironbridge Gorge Museum
Enginuity
Coalbrookdale Museum of Iron
Darby House

Interviews

Mr. E.A. Roberts is known to have been the last charcoal burner in the forest in 1947; luckily Gilbert Brain had watched and learnt the skills from MR Roberts as a nipper. In 1985 Pete Ralph was working for the Forestry Commission, Gilbert was looking to do a charcoal burn and called upon him for timber. With combined knowledge they built a forest kiln and successfully made charcoal. The basic principles of the process they were using are ancient. Pete Ralph continues to demonstrate the process in order to preserve its historical importance.