

USEFUL SOURCES OF FURTHER INFORMATION

Useful Contacts

The Heritage Officer and Conservation Officer in your Local Authority should be the first person to contact with queries regarding heritage and conservation work. In Co. Kilkenny, contact 056-779400. See www.kilkennyccoco.ie/eng/Services/Heritage/. For a listing of Heritage Officers in the country, see www.heritagecouncil.ie/.

Other useful contacts include:

Irish Artist Blacksmiths Association:

Architectural Heritage Advisory Unit, Department of Arts, Heritage and the Gaeltacht:

The Heritage Council,

Irish Architectural Archive,

Irish Georgian Society,

Royal Institute of the Architects of Ireland,

The Wrought Iron Advisory Centre,

Chris Topp & Co. specialize in the salvage and production of wrought iron for heritage wrought iron work:

Tel. (01) 462 2788

Tel. (01) 888 2000

Tel. (056) 777 0777

Tel. (01) 663 3040

Tel. (01) 679 8675

Tel. (01) 6761703

www.irishartistsblacksmiths.com/

www.ahg.gov.ie/en/Heritage/BuiltHeritageandArchitecturalPolicy/

www.heritagecouncil.ie

www.iarc.ie

www.igs.ie

www.riai.ie

www.realwroughtiron.com

www.christopp.co.uk

Useful Films

An Introduction to the Vernacular Forged Field Gates of Kilkenny (5min):

Advice on conservation and retaining vernacular field gates with interviews with a blacksmith and a farmer (14min):

https://www.youtube.com/watch?v=DCLOYKymjH4&list=UUDM6mTrAlh_1wB_VIZ-DmzQ

https://www.youtube.com/watch?v=pKA_-rW3-k&list=UUDM6mTrAlh_1wB_VIZ-DmzQ

Useful Publications

Department of Environment, Heritage & Local Government (2009), *Iron. The repair of Wrought and Cast Ironwork*

Department of Environment, Heritage & Local Government (2007), *Maintenance - the care of older buildings*

www.ahg.gov.ie

www.ahg.gov.ie/en/Publications/HeritagePublications/BuiltHeritagePolicy/Publications/

Further Reading

Bell, J. & Watson, M. (2011), *Donegal's Farming Heritage*. Donegal County Council

Rynne, C. (2006), *Industrial Ireland 1750-1930, an archaeology*, Cork: The Collins Press.

Ashurst, John. (1988), Ashurst, Nicola; Wallis, Geoff and Toner, Dennis, *Practical Building Conservation, Volume 4: Metals, Aldershot*: Gower Technical Press Ltd

English Heritage. (1998), *English Heritage Research Transactions, Metals, Volume 1*. London: James & James

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Glasgow West Conservation Trust, (1993), *Conservation Manual, Section 4: ironwork, Glasgow*. Glasgow West Conservation Trust.

Keohane, F. ed. (2001), *Period houses – a conservation guidance manual*. Dublin Civic Trust.

Hayman, R (2000), *Wrought Iron, Buckinghamshire*. Shire Publications.

Walker, B. et al. (2004), Historic Scotland TCRE Technical Advice Note (no.29) *Corrugated Iron and Other Ferrous Cladding*. Historic Scotland, Edinburgh.

Historic Scotland. (2007), *Inform Guide. Maintenance of Iron Gates and Railings - Conservation Repair and Maintenance*.

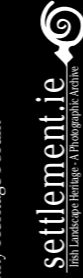
Dáithí Ó hÓgáin (2006), *The Lore of Ireland*. Collins Press

Dáithí Ó hÓgáin (1991), *Myth, Legend and Romance: An Encyclopaedia of Irish Folk Tradition*.

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THE VERNACULAR FORGED WROUGHT IRON FIELD GATE



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OUR HISTORY...OUR HERITAGE...OUR RESPONSIBILITY

The Vernacular Forged Wrought Iron Gates of County Kilkenny

The wrought iron field gate is an often forgotten and overlooked part of our cultural heritage.

This brochure is produced as part of the Kilkenny Field Gates Project to identify, record and raise awareness about wrought iron field gates in County Kilkenny. It illustrates and tells the story behind the vernacular wrought iron Irish field gate: its historical context; the skills and craftsmanship of the blacksmith; advice on best conservation practices; and practical solutions to adapting the gates to suit modern farming practices.

In addition to this brochure, field gates in 62 townlands in the vicinity of Thomastown/Inistige/Grauguenamanagh and Castletcomer have been surveyed and recorded. A number of short films and educational resources have also been produced.

Thanks to Shem Caulfield, Project Consultant, and to the project committee – Errol Delaney, James Eogan, Anna Meenan and Colm Murray.

This project is an action of the Kilkenny Heritage Plan. It is co-ordinated and funded by the Heritage Office of Kilkenny County Council, in partnership with the Heritage Council and the Kilkenny Heritage Forum.

I hope that you find the brochure informative and that it will prompt further discussion about the future of our wrought iron field gates.

Dearbhala Ledwidge
Heritage Officer
Kilkenny County Council
August 2014

Conserving Our Heritage

At virtually every crossroads throughout Ireland at one time there was a blacksmith's forge; a place once central to the rural economy; a place for congregating; for the repair and maintenance of farm machinery; for shoeing horses, and for making objects like wrought iron farm gates. Many, if not most, of these forges are no longer in operation. However in each locality there still remains evidence of their existence through a number of wrought iron field gates.

Each blacksmith had his own distinctive style and this local style is a key contributor to the richness of our landscape heritage. Apart from being beautiful functional objects in themselves, wrought iron gates and their pier settings, each tell a story. They symbolize the efforts of our forefathers and they remain prime examples of local craftsmanship in metal and stone.

The landscape and the objects contained in it are the very fabric of our rural heritage; they are what make us unique.

Landowners and farmers are encouraged to conserve and maintain these valuable heritage objects so that we can ensure that our blacksmithing heritage can be passed on to future generations. We will also have contributed to conserving the richness of our beautiful and unique living landscape.

I hope this brochure gives you an insight into the richness of our wrought iron legacy and that it motivates you to action.

Shem Caulfield
Author
August 2014

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9. ADAPTING GATES TO CURRENT NEEDS

Wrought iron gates, as well as being objects of beauty and heritage, also have a function. Gates are a critical part of farm infrastructure. Modern farming methods which employ bigger machinery can find the traditional wrought iron gate and its piers too narrow to negotiate. This has resulted in piers being demolished, gates removed, gateways widened and a variety of solutions developed to manage the larger gate opening. Below are a number of ideas & suggestions that will help to ensure that wrought iron gates are retained whilst remaining functional and addressing the need of modern farming.

A NEW GATE OPENING

Gateways are an excellent example of local craftsmanship and skilled labour, displaying the work of the stonemason as well as the blacksmith. Stone piers can also help define the particular character of an area. They should be retained and maintained in good order, using similar stone if it needs to be repaired and lime mortar with flush or resessed finish. Where a traditional wrought iron gate and its piers proves to be too narrow, a possible solution is to develop a completely new opening near the existing traditional one, retaining the gate and its piers in their original position. However, the creation of a new vehicular entrance may require planning permission. Issues such as tree or hedgerow removal and road safety will have to be addressed as part of the planning process. This is worth the effort to ensure that the original wrought iron gate and its stone piers remain intact.

HANG THE GATE

Wrought iron gates are very heavy and therefore should be hung properly in order to ensure ease of opening and closing. If not hung properly patience will be lost, the gate will become a nuisance and may eventually be discarded.

USE YOUR OLD GATE STOCK

Rather than removing and discarding old wrought iron gates, it is preferable to reuse old gates if at all possible. Where a gate opening has been widened there are a number of solutions that can see wrought iron gates reused. Two wrought iron gates hanging opposite each other will give a new wider opening. This will give the wrought iron gate a new lease of life, it will look attractive and will outlive any galvanized tubular steel gate. By placing a removable central metal pier between the gates it will allow the gates to be closed and locked securely.



Two wrought iron gates with removable central pillar



Some examples of wrought iron gates used in widened gate openings.



Extended wrought iron gate and ressed pier

EXTENDING A WROUGHT IRON GATE

If it is necessary to extend an existing wrought iron gate, a blacksmith experienced in traditional repair techniques should be engaged and similar materials and techniques to those used historically should be employed. The main method of extending a gate in the traditional manner is by hot riveting or forge welding. Ideally electric welding of mild steel to wrought iron is not recommended.

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8. CONSERVATION, RESTORATION AND REPAIR OF WROUGHT IRON FIELD GATES

Where a gate is in need of repair, then this work should be completed sensitively in order to protect our history and conserve our heritage for future generations.

REPAIRS

When repairing wrought iron gates, like-for-like should apply. Similar materials to those used historically should be employed. It is important that a blacksmith experienced in the use of traditional repair techniques and materials carries out any necessary repairs and that traditional detailing and methods are used. Forge welding and joining techniques such as scarf joints (see A, below), mortice and tenon joints (see B, below), rivets, and mechanical fixings are just some of the traditional repair techniques.

Electric welding or the use mild steel is generally not appropriate in repairs to wrought iron. Despite the relative expense, wrought iron is more durable and should defray the cost of maintenance over the lifetime of the gate.



Preparation of a mortice & tenon joint.



Making a hot rivet



Riveted repair to a traditional gate



Riveted extension piece to a traditional gate

RIVETING

In a forge, hot riveting is one of the primary ways of joining two pieces of metal together. The rivet is simply a bar with its ends hammered over to prevent it slipping out of the hole. It is a very effective way of joining ductile metals such as wrought iron. Rivets are heated, held in position with tongs while the protruding end is hit with a hammer to form strong reliable fixings. 2.5 million rivets were used in the construction of the Eiffel Tower.

FORCE WELDING

Welding is the joining of the same or similar kind of metal together. Unlike electric welding where a new material is introduced to weld or bond two materials together, forge welding causes both pieces to merge together as one without the introduction of another material. In forge welding the pieces to be joined are heated to what is generally referred to as "welding heat". The ideal heat for general forging is the bright yellow-orange color appropriately known as a "forging heat". This is one of the reasons why many blacksmiths work in dim, low-light conditions in order to see the glowing colour of the metal.

FIXINGS

Galvanised fixings can rapidly corrode and should not be used in wrought iron repairs. Stainless steel fixings are generally recommended.



Scarf joint repair



Forge welding

1. A BRIEF HISTORY OF IRON SMELTING IN IRELAND

700BC

700BC - AD1500 Small scale localized production of iron from bog ores. This iron was produced in Bloomeries. (see information panel 2 for details on Bloomeries)

AD1500 English smelters arrive with new smelting technology. They locate iron ore and use local timber to make charcoal to fuel large scale smelting furnaces.

AD1686 Charcoal fuelled iron production reaches its height. Ireland exports 1,692 tons of processed iron in that year.

AD1700 Timber for charcoal production becomes scarce. Much of Ireland has become deforested.

AD1500

AD1686

AD1709

AD1858

AD1686 Charcoal fuelled iron production reaches its height. Ireland exports 1,692 tons of processed iron in that year.

AD1700 Timber for charcoal production becomes scarce. Much of Ireland has become deforested.

AD1858 The last charcoal smelting furnace in Ireland at Creevelea, County Leitrim closes. Ireland becomes a net importer of processed iron bar and iron goods.

AD1709 Coke developed in England as a fuel for large scale smelting. The development of coke as a fuel marks the beginning of the Industrial revolution.

THE IRISH IRON SMELTING INDUSTRY

Iron was produced on a small local scale in Ireland from 700BC to early AD1500. The technology of large scale smelting was imported into Ireland by settling English iron-makers in the 16th century. Ireland, with an abundance of iron ore, timber for charcoal, limestone for flux and waterpower, presented all the necessary resources for a large-scale iron smelting industry to develop. The industry of smelting iron-ore in Ireland experienced a dramatic rise and decline over the course of the seventeenth and eighteenth centuries, finally coming to an end in the mid nineteenth-century. This industry is thought to have peaked around the years 1696-7, when the export of iron from Ireland reached 1,692 tons. By 1778 there were only two charcoal-fueled furnaces operating in Ireland, Emmisscourtly, County Wexford and Mountrath, County Laois. (*Industrial Ireland - An Archaeology*, Colin Rynne)

The eighteenth-century saw a steady decline in the iron industry in Ireland. This was due to the widespread depletion of Irish forests, combined with a later shift from the use of timber-based fuel (charcoal) to coal-based fuel (coke) to fire the furnaces. By the year 1740, Ireland was only exporting 14 tons of iron and was importing 4,191 tons. In 1858, the last commercial iron smelting furnace in Ireland, at Creevelea, County Leitrim, closed and no further attempts were made to smelt ore. In the second half of the nineteenth-century, all the iron used in Ireland was imported, either as pig iron for conversion in Irish foundries, wrought iron, or as finished iron products. Along with iron, coal and coke were also imported and replaced charcoal as the fuel for Irish foundries and blacksmith's forges.

CHARCOAL

The iron smelting furnaces were located in heavily wooded areas with access to a constant water supply. This ensured a reliable energy source for the water-powered bellows and, of course, a convenient supply of timber for charcoal. Approximately 1.7 tons of charcoal was required to produce 1 ton of wrought iron. In 1807, Isaac Weld wrote of the Killarney Valley " . . . not long since all these mountains were clothed down to the waters edge with oaks of large growth; most of these venerable trees, however, have fallen to the axe which has been busily plied year after year. The destruction of these forests is principally attributable to the manufacture of iron - a business once carried on with great spirit in various parts of the county and for which an abundant supply of charcoal was required. As fuel became scarce, the iron works declined, and at last they were totally abandoned. . . ." (*Irish Oak Renewal Foundation*)



Bloom from bog iron ore. (courtesy John O'Neill)

COKE

Coke is a carbon-rich residue of coal obtained through a process known as distillation. Coke is used primarily in blast furnaces to make pig iron. It serves both as fuel to heat the iron ore and limestone and replaces the oxygen in the ore with carbon as an ingredient in the finished steel. For centuries, charcoal was used in iron making but a shortage of wood in Great Britain led ironmaster Abraham Darby to distill the world's first coke for iron making. The first casting using coke was poured on 4 January 1709, and this date marks the beginning of the Industrial Revolution that eventually transformed the Western World.



Artist's visualisation of medieval smithy. Lowpark, Co. Mayo (Fergus Miland (Mayo Co. Co./NRA)



Medieval Smelting Hearth with iron slag. In situ (Wormlabourn, Co. Tipperary) (Marie J. Vesely Ltd./NRA)



Iron Stone mined at Castlecomer. (courtesy Fort Library)

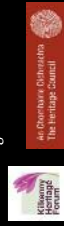
IRON SMELTING IN COUNTY KILKENNY

Iron mining and smelting is one of the oldest mining related industries in Ireland, arguably extending back to the time of its introduction into Ireland by Iron age Celtic invaders about 600BC.

Traces of old "bloomeries", charcoal fired iron smelters, have been found in a number of locations throughout the country.

In Castlecomer, County Kilkenny, iron ore (iron stone, see illustration above) was first extracted in 1647. Early manuscripts chronicle the course of iron mining in Fassidnan, the earliest mention being a furnace at Kildroyn in Lough, and also a forge in Ballinakill around 1635. Iron ore was also commercially mined in Coolade, Crutt, Firoda, Castlemynes and Coolbawn. In fact coal was discovered by accident while prospecting for this iron in Castlecomer.

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“Cad a dhéanfamid feasta gan adhmad Tá déireadh na goillte ar lár.”

(What will we do without timber. The end of the forests are at hand.) (Extract from *Casine Cill Chais*, anon)

2. WHAT IS WROUGHT IRON?

Wrought iron is a pure iron and a very ductile and malleable material, it contains very little carbon and like timber it is fibrous in its composition. The word 'wrought' means worked by hand. Wrought iron is a special type of metal; its production and crafting into beautiful functional objects are part of our historic and heritage legacy. Wrought iron is no longer produced on a commercial scale. Many products currently described as wrought iron, such as garden furniture and gates are actually made of mild steel. Items that are currently made of mild steel, were originally produced from wrought iron, including gates, rivet, nails, chains, rails, nuts, bolts, horseshoes, straps for timber roof trusses, and ornamental ironwork.

COMMERCIAL IRON SMELTING

Most early processes in Ireland involved smelting iron ore in a bloomery furnace where the temperature is kept low enough so that the iron does not melt. This process produces a spongy mass of iron called a bloom, which then has to be consolidated with a hammer. The earliest evidence to date for the bloomery melting of iron is found at Tell Hammeh, Jordan, and dates to 930 BC. In Ireland the earliest evidence for bloom-smithing dates from the 7th/8th century BC approximately 2700 years ago. The bloomery consisted of an outdoor pit and chimney made of earth, clay, or stone. Near the bottom, clay pipes, tuyères, entered through the side walls to allow air to enter the furnace, either by natural draft, or forced with bellows. Limestone was often used as a 'flux' in a bloomery to aid in the removal of impurities. The bloomery furnace produced a 'bloom' directly from ore, which must later be reheated and beaten with a hammer. Iron treated this way is said to be wrought.

LATER IRON SMELTING DEVELOPMENTS

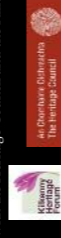
From the medieval period bloomeries began to be replaced by other processes. The reveratory furnace was developed. This was a smelter that kept the iron ore separate from the fuel (initially charcoal, later coal and subsequently coke). A further process called "puddling" was developed. This process saw the molten metal stirred or "rabbed" with long bars, called puddling bars or rabbles, in order to release carbon and create a very pure iron called wrought iron. The air, stirring, and "boiling" action of the metal help to oxidize the impurities and carbon out of the pig iron. As the impurities oxidize, they form a molten slag while the remaining iron particles solidify into spongy wrought iron balls, called puddle balls. The iron went through a further process that saw it rolled, hammered, cut, re-heated, hammered and rolled again; the more often this process was repeated the better the grade of wrought iron. Traditionally these grades were classified as "best", "best best", and "best best best" quality. Most 19th century applications of wrought iron, including the Eiffel Tower and the original framework of the Statue of Liberty used puddled wrought iron.

The last puddling furnace for producing wrought iron in England closed in 1974 and since then no more wrought iron has been produced on a commercial scale in Ireland, the UK or the rest of Europe, although reclaimed and recycled wrought iron is manufactured in the UK for conservation purposes.



Making a door latch

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7. MAINTENANCE OF WROUGHT IRON

Wrought iron is strong and very durable, untreated it can remain intact for 300 years or more provided that care is taken never to allow water get trapped on the metal or soil or vegetation to cover the iron as this will eventually cause serious corrosion.



Light rusting of ironwork

PROTECTIVE LAYERS

Most wrought iron achieves a rusty appearance. A thin rust layer appears on the surface of the metal where the iron has oxidized. This rust layer is inactive corrosion and does not cause any long-term deterioration, generally this patina can remain as it provides a protective layer for the metal. If it is intended to paint the metal then it should be removed with turps.

MILL SCALE

The second protective layer is called mill scale. This is a layer on the surface of the iron that was achieved when the metal was first made. Intensive grit or sand blasting will remove this protective layer and is therefore not generally recommended. Intensive grit blasting may also obliterate the blacksmiths manufacturing marks and deplete the character of the piece.

REPAIR WORK

When repairing wrought iron it is important that an appropriately qualified and experienced person carries out any necessary repairs and that traditional detailing and techniques are used. Mild steel is not generally recommended in repairs to wrought iron.



High level of corrosion requiring professional attention.



Poorly maintained ironwork causing corrosion



Painted ironwork

PAINTING IRONWORK

Never paint over rust. A clean, well-prepared surface is essential before applying paint. This will ensure that the paint adheres properly to the iron, or underlying paint, and will improve its effectiveness. It will also prolong the life of the paint.

Sand the existing paint to provide a good key for the fresh coats. It is important to allow each coat to dry thoroughly before applying the next. This prevents the upper coats being damaged by the evaporation of solvents from the undercoats.

Painting ironwork should not be carried out between the months of November and February as conditions are likely to be too damp and cold to allow paint to cure properly.

Paint thickness is also important; several thin coats are more effective than fewer thick coats. In practice blacksmiths recommend two coats of zinc-based primer followed with a top coat of eggshell.

Reference: Department Environment Heritage and Local Government (2009) Principal author: Ail Davy and Blacksmith Paul Davlin.

CORROSION PROTECTION

Lightly brush away loose corrosion, dirt and dust using a soft-bristled brush. Flush out crevices with mineral turps. Brush on Owatrol oil and apply a second coat.

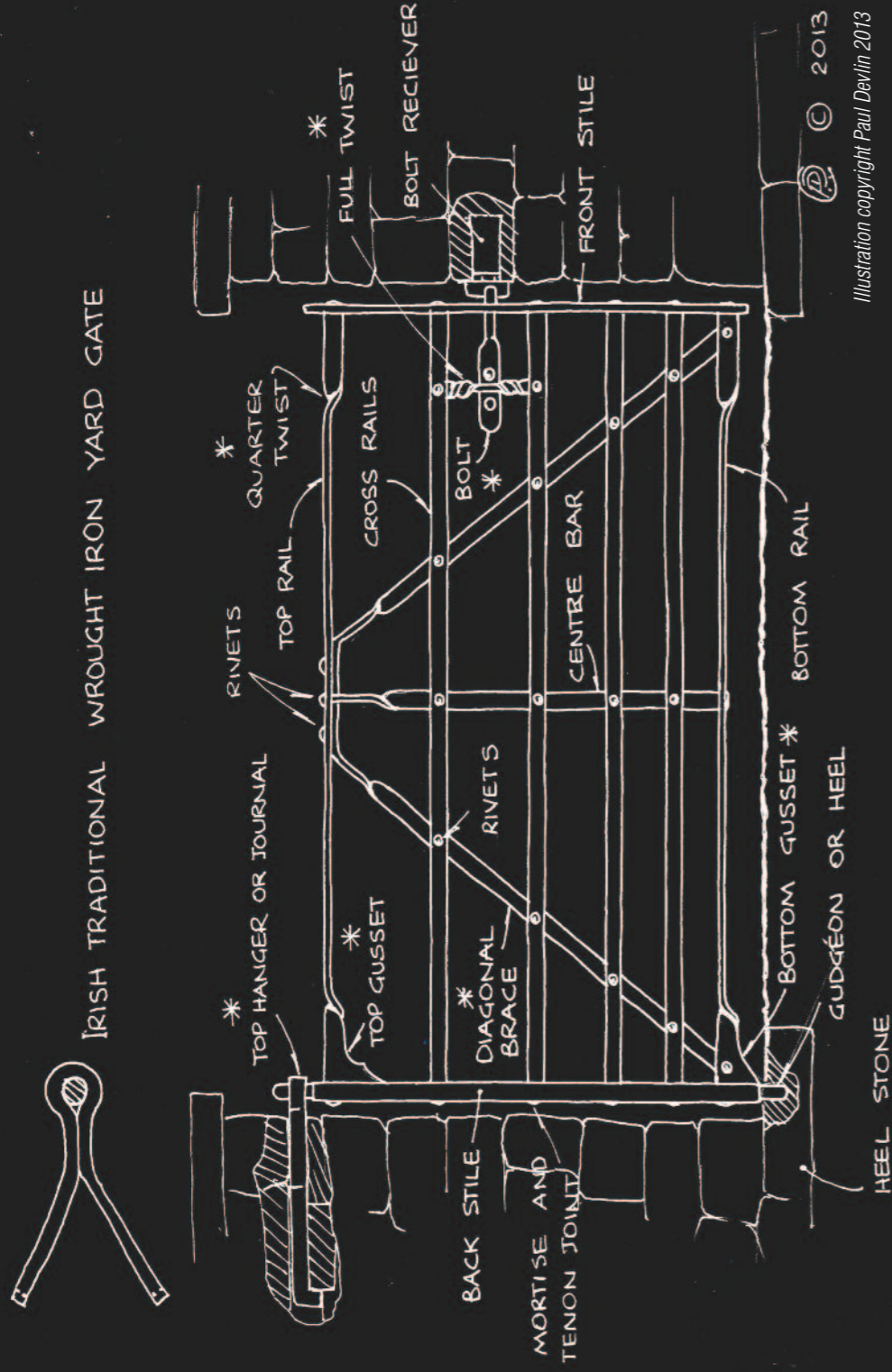
Where active corrosion has deteriorated the metal to the extent that the gate structure is at risk then a more robust treatment will be needed. The problem area may need soda blasting and/or new pieces added to the gate; consult your local blacksmith.



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6. IRISH VERNACULAR FORGED WROUGHT IRON FIELD GATE: THE ANATOMY



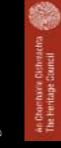
TOP HANGER - one piece hanger which catches into or behind pier stones.

GUSSETS - are usually on top and bottom rails to support cantilever effect and are made in many different styles and shapes.

BOLT - sometimes a latch, very functional in design, and usually complementing the gate construction style or techniques.

TWISTS - the use of twists on gates are both a practical and aesthetic feature.

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3. THE BLACKSMITH AND HIS FORGE

"I will forge in the smithy of my soul the uncreated conscience of my race." James Joyce, *Portrait Of An Artist*

THE BLACKSMITH

A blacksmith is a skilled craftsman who creates objects from wrought iron or steel by forging the metal; that is, by using tools to hammer, bend, and cut. Blacksmiths produce objects such as gates, grilles, railings, light fixtures, furniture, sculpture, tools, agricultural implements, decorative and religious items, and cooking utensils. Despite common usage, the person who shoes horses is a farrier (though a blacksmith may fabricate the shoes). Many farriers have carried out both trades, but most modern or engineering smiths do not. The blacksmith was central to the rural community's economy, particularly to farming. Apart from being a focal point for people to meet and exchange views the forge manufactured and repaired tools and equipment that were essential to agricultural production. The importance of the local forge to rural communities up to the 1950's and 60's cannot be overstated. You can get a sense of how widespread blacksmiths forges were by consulting an historic 25" map available online from Ordnance Survey Ireland (www.osi.ie) and look for the word "smithy" Although many of the traditional blacksmiths forges are no longer with us there is still a strong and vibrant blacksmithing community in Ireland. Details can be found on www.irishartistsblacksmiths.com

THE NINE IRONS

The blacksmith and the forge hold a special place in folk memory and folklore. Apart from making tools and repairing equipment the blacksmith was also associated with cures for animal and human medical conditions, dentistry, marriages, forging deals, making charms to bring good luck and health.

One type of charm made by Irish blacksmiths in the 1800s was known as *The Nine Irons*. This amulet consisted of eight miniature charms of everyday objects, made by the smith, which people believed were effective in bringing good luck, averting and healing sickness, countering charms and spells and warding off malignant spirits and influences. The charms included a plough coultter and a plough share to help a child afflicted by fits and starts while sleeping. Shovel and spade blades to help retrieve lost items. A hatchet and saw to ward off negative influences. The griddle pan, made red hot, ward off any challenges. The horseshoe nail brought good luck. The ninth charm was a cross, which the people added themselves.

(9 Irons information courtesy Patrick Alexander Strahan. www.9ironscrafts.ie/)

The Village Blacksmith

Henry Wadsworth Longfellow. 1807–1882

Under a spreading chestnut tree

The village smithy stands;

The smith, a mighty man is he,

With large and sinewy hands;

And the muscles of his brawny arms

Are strong as iron bands.



Blacksmiths forge

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Gate hanging stile



Gate latch



Decorative and structural design



John (back) & Julia O'Garra, Rahenahore Forge, near Gaigueemagh, Co. Kilkenny circa 1947. (photo courtesy of the Whelan family, Mong)

The Forge

Seamus Heaney 1969.

All I know is a door into the dark.

Outside, old axes and iron hoops rusting;

Inside, the hammered anvils short-pitched ring,

The unpredictable fantasia of sparks

Or hiss when a new shoe toughens in water.

The anvil must be somewhere in the centre,

Horned as a unicorn, at one end and square,

Set there immovable: an altar

Where he expands himself in shape and music.

Sometimes, leather-aproned, hairs in his nose,

He leans out on the jamb, recalls a clatter

Of hoofs where traffic is flashing in rows;

Then grunts and goes in, with a slam and flick

To beat real iron out, to work the bellows.

Blacksmiths anvil and tools

4. BLACKSMITH TOOLS

Unlike many other craftsmen, blacksmiths are able to make most of their own tools. The principal tools are hand hammers and sledgehammers, a great number and variety of chisels, punches and drifts and a selection of tongs with bits or jaws of various shapes. Tools that fit into the tool hole of the anvil, usually with their counterpart top tools fitted with a suitable handle, are required for shaping and cutting. For measuring and marking off, callipers, dividers, a set square and a rule are needed.

HAMMERS ¹

For everyday work, most blacksmiths use a ball-peen hand hammer weighing about 750 to 1250 g. A hand hammer should be of a weight that suits the smith. It should have a longer shaft than is usual for other work and be well-balanced. Often special hammers are used for particular jobs. These the smith usually makes as the need arises. Old car-axe shafts are suitable material for hammers. Sledgehammers may be double-faced, straight or cross-peen, and usually weigh from 3 to 5 kg. They have long shafts for use with two hands. All hammer heads must be firmly fastened to their shafts. Both wooden and metal wedges are used. The centre lines of the hammer head and its shaft must be at right angles to each other. Hammer faces should be polished and kept free of marks.

CHISELS ²

The blacksmith needs chisels for cutting both cold and hot metal. For cutting cold metal chisels are comparatively short and thick, while for hot metal they are thinner and longer. Chisels can be of many shapes and sizes, special ones often being made to facilitate the work in hand. Smiths are often called upon to make chisels for other tradesmen. These have to be hardened and tempered to suit particular purposes.

SETS

Like chisels, sets are used for cutting hot and cold metal. Basically, they are chisels with handles or shafts. Wooden shafts are easiest to handle but many smiths use metal-rod handles. These are cheap and easy to make and fit. As with chisels, sets for cold work are short and thick whereas for hot metal they are longer and thinner. Again, these can be made in a wide range of shapes for various purposes.

TONGS ³

The blacksmith uses many different types and styles of tongs. Tongs must hold the workpiece firmly without slipping. They are often made for one specific job or adapted for a particular workpiece and will vary in length, size and weight, as metal sizes also vary.



Blacksmiths tools



Twisting a wrought iron bar



Forge welding

HARDY

The hardy is a chisel designed to fit the tool hole in the anvil. It is used with a hand hammer for cutting both hot and cold metal.

PUNCHES FOR HOT WORK ⁴

These can be round, square or almost any other shape to suit the job. Punches should be long enough to keep hands away from reflected heat and large ones can be fitted with handles. They are usually designed to remove the minimum amount of metal from the job and to swell the hole to size and shape.

DRIFTS

Drifts are rather like short punches. Made of carbon-tool steel, they are of exact size and shape and may be round, hexagonal, octagonal or almost any other shape. They are usually hammered through the work to finish a hole to size and shape while the metal is only at a dull red heat. A little grease can be applied to make the work easier and to give a better finish.

FULLERS

These, like chisels or sets, are made in various sizes and have rounded edges. Small ones may be hand-held while larger sizes require shafts or handles and are struck with a sledgehammer. Fullers are usually made in pairs. The bottom fuller fits into the tool hole of the anvil. They are used for setting down shoulders in preparation for forging tongs and for drawing or moving metal in one direction.

SWAGES

These are top and bottom tools between which metal is worked. The most common are semicircular and are used for forming round sections to size after previous forging. The bottom tool fits into the tool hole of the anvil. In some cases top and bottom tools are hinged or fastened together by a spring strap or rod. These can be useful when a smith is working alone. They are also common in power-hammer work.

FLATTERS AND SET HAMMERS

These have flat faces with sharp or rounded edges according to requirements and are placed on the work and struck with the sledgehammer. The set hammer is most often used for setting in shoulders, while the flatter is a good finishing tool and should be used only to impart a good finish to flat surfaces.

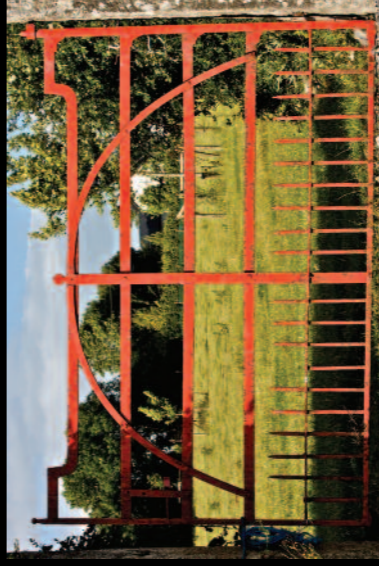
BOLSTER PLATES

These are steel plates with various holes drilled or punched into them. They are used for forming neat shoulders at change of section in the workpiece. Some types have round and square countersunk holes in them and enable countersunk-headed bolts to be made as for ploughshares.

5. THE VERNACULAR FORGED WROUGHT IRON FIELD GATE AND ITS PIERS

Ireland has a unique heritage in wrought iron field gates. The word 'wrought' means worked by hand and the design of these gates often illustrates a distinctive local style. This local or vernacular style shows the elegant metal craftwork created by a local blacksmith. Not only are they wonderful objects in themselves but our beautiful gates are physical evidence of the long tradition of our blacksmithing and iron smelting industry. The last charcoal burning smelting furnace in Ireland closed in 1858; and the last furnace producing wrought iron in England closed in 1974 and since then no more wrought iron has been produced in Europe.

The photographs on this panel illustrate the design of some of the wide range of forged wrought iron gates and piers, some of which are unique to County Kilkenny.



Single wrought iron gate with stone piers



Double gates with latch



(above and below) Different latch styles

OUR LEGACY: A UNIQUE HERITAGE

MAKERS NAMES AND MARKS

Some blacksmiths signed their work and many put their own distinctive marks on the gates they made. If you look closely at the latch handle or on the closing stile you may be able to detect the blacksmiths name.



McCarthy (makers mark)

GATE PIERS

In many cases coupled with wrought iron gates are sets of elegant cut stone piers illustrating the craft of the local stonemason. Most traditional vernacular gate piers are built of stone and lime mortar. Traditional piers occur in a variety of design styles and can be square, round, D shaped or offset square. The design of round and offset piers allows for the gate to open to a wider arch than that would be possible with a square pier.



Round piers

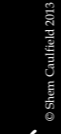
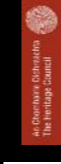
LATCH STYLES

Throughout the country there is a wide diversity of latch designs with individual blacksmiths developing their own distinctive solutions.



Square piers

THIS PROJECT IS AN ACTION OF THE KILKENNY HERITAGE PLAN. It is co-ordinated and funded by the Heritage Office of Kilkenny County Council, in partnership with the Heritage Council and the Kilkenny Heritage Forum.



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