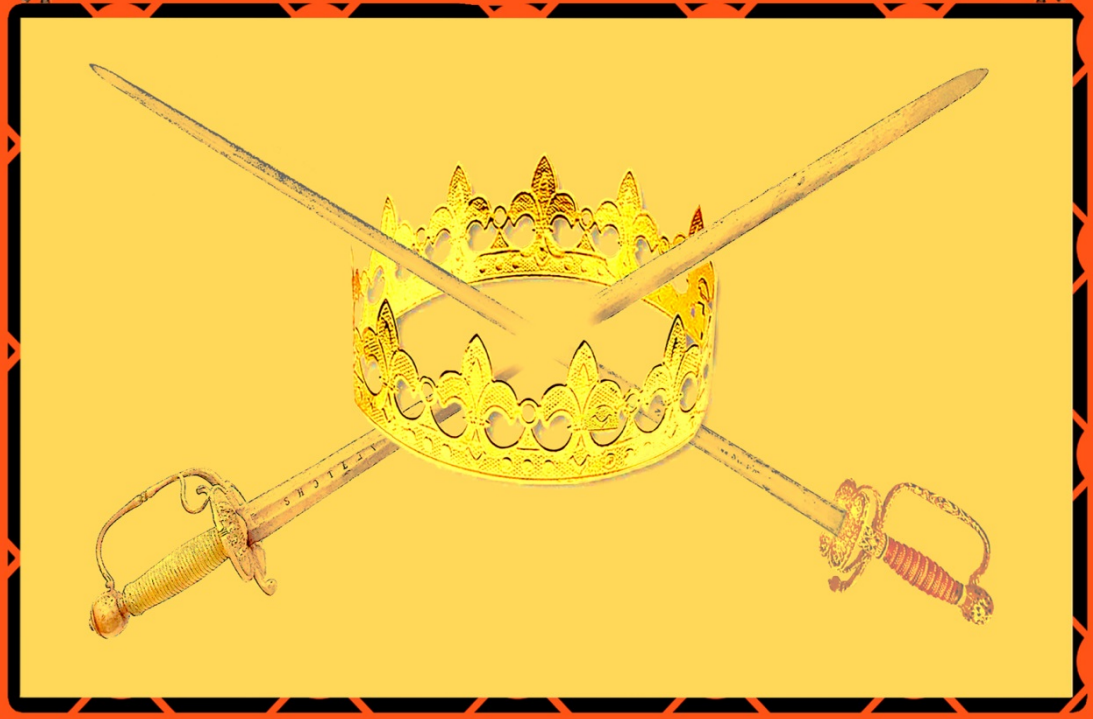
THE CROWN

AND

CROSSED SWORDS

GERMAN SWORD-SMITHS IN SHOTLEY BRIDGE

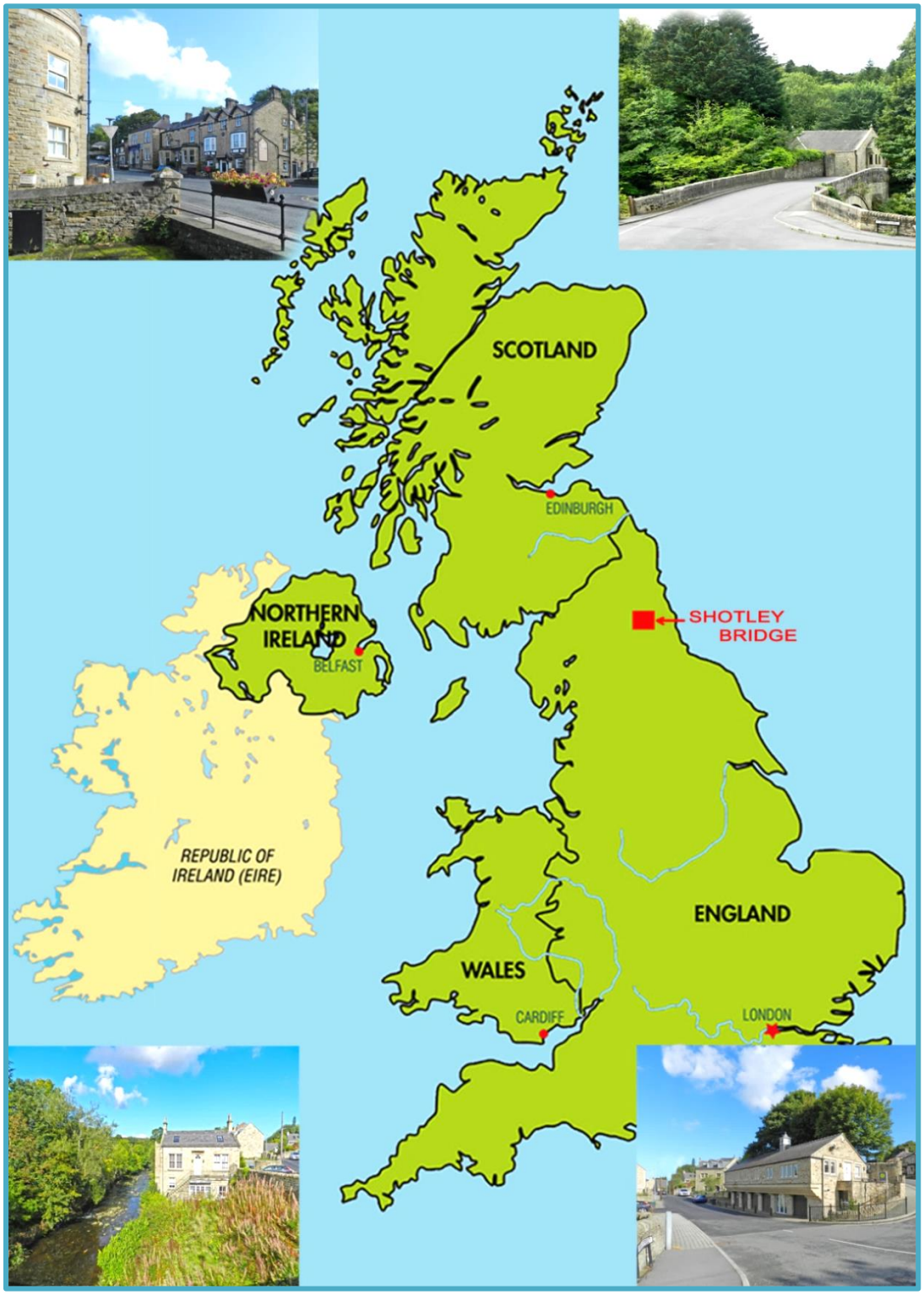


Sixteen German swordmakers and their families arrived and settled in the tiny hamlet of Shotley Bridge in 1687. Take away road signs and sat-nav and I am certain we would never find it today – so how did those blacksmiths end up there? More importantly: why?

This story has its true beginning in Sri Lanka c.500bCe. It travels the Silk Roads to the Religious Crusades in Damascus; arrives in Greenwich courtesy of Henry VIII before coming north to Cumberland during the reign of Elizabeth 1st; and finally, at the start of the 1600s, it gives birth to three hundred years of steel industry which results in our industrial revolution – right there in that incredible little valley on Tyneside.

Did any of this matter to those Germans? Did they even know why they were hidden in Shotley Bridge, or who had brought them almost five hundred miles from home? Many thousands of swords were made by them, but while you will find their descendants in the Derwent Valley, I doubt you will find one of those swords.

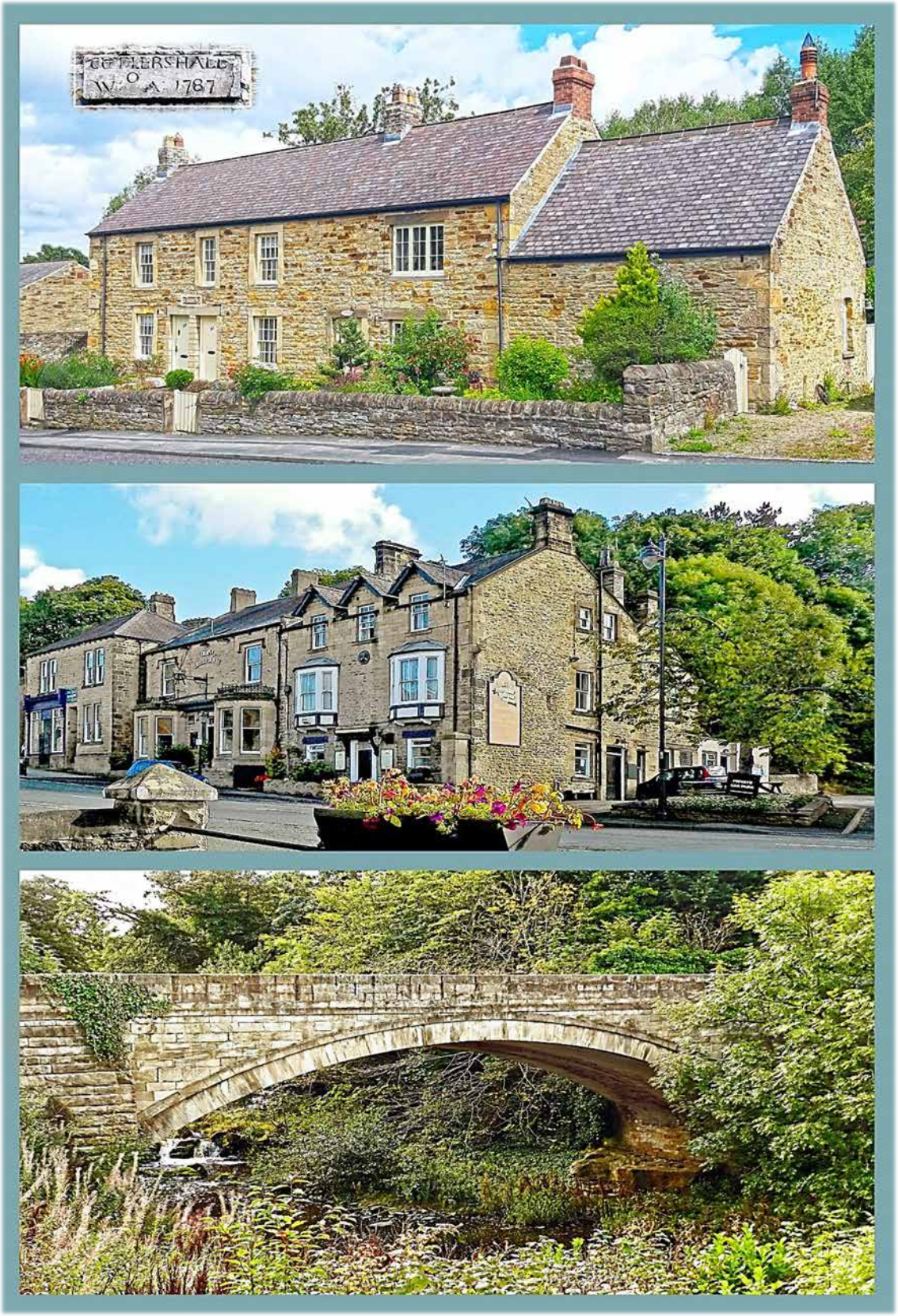
Their story has been a Machiavellian endeavour of cunning masquerade, fallacy, subterfuge and myth that has mystified chroniclers and researchers for two hundred years or more; here's why. Keith Fisher 2020.



Shotley Bridge is fifteen miles south-west of Newcastle,
midway up the valley of the Derwent River that feeds the Tyne.
The river was dammed in the 1960s to create the Derwent reservoir.
Inset images are of the bridge, the hotel, and modern day Wood Street.

Shotley Bridge today

Cutlers Hall. Crown & Crossed-Swords Hotel. The Bridge.



Designed, illustrated and typeset
by the author.

Contact:
keithfisher@blueyonder.co.uk

Promotional/reference copies printed and bound by

Photoline.co.uk

THE CROWN

AND

CROSSED SWORDS

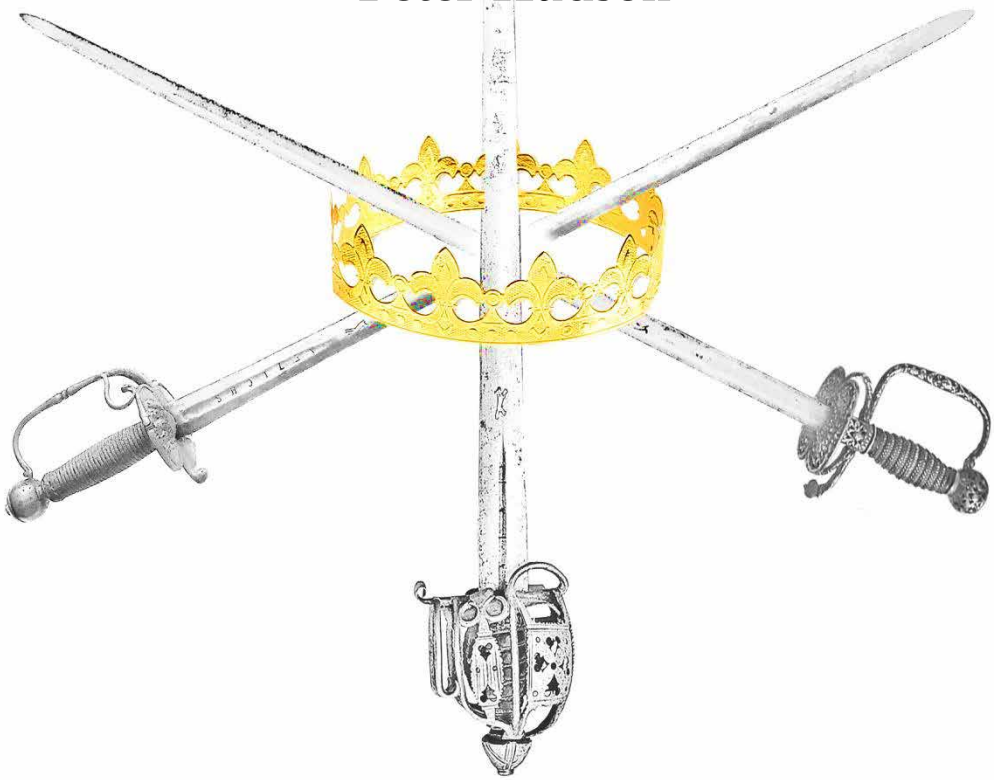
Keith Fisher

in collaboration with

Paul Heatherington

Jim McDougall

Peter Hudson



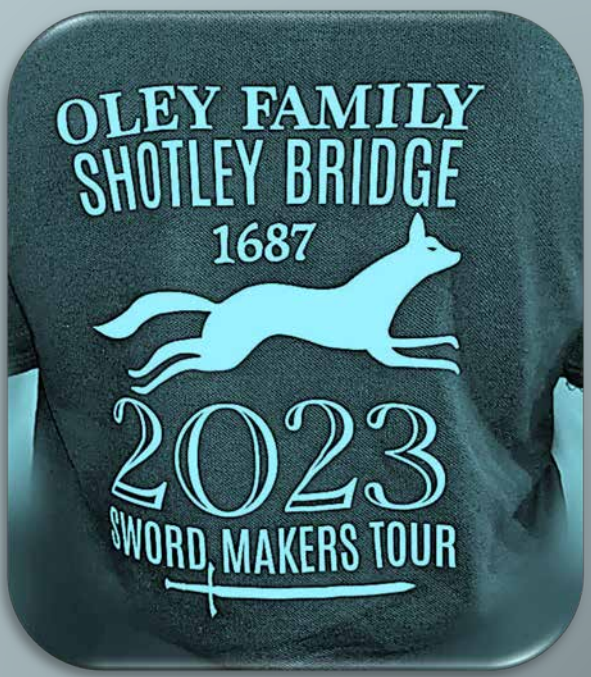
CONTENTS

ADDENDA

SUPLEMENTARY MATERIAL

REAR OF THE BOOK, AFTER PAGE 139

I. Village- Early Times
I. Political Factions
II. First blade-types
IV. Cutting Edges + The President Washington connection
V. Colichemardes: is their history finally established?
VI. The Sword War of 1786: testimony of Mr Thomas Gill Senior
IX. Further notes on the Sword Wars
IX. The Hidden One: Celts and billet forging
X. The Mohll family tree
XI. Cranstone: Notes on Derwentcote Forge



Cast of Important Characters

Daniel Hoechstetter: Mining and Minerals Surveyor from Bavaria.
Tasked by Queen Elizabeth 1st with surveying the country for metals: base and precious.

King Charles II (& brother King James VII/II)
Returned from exile to be restored to the throne, wearing fashionable smallswords.

Johannes Dell/John Bell: Sword-grinder and 1st syndicate member.
Last German sword-mill owner in Hounslow after the Civil War.

Huguenots: Protestant refugees with exceptional skills.
Dispersed across Europe during the Thirty Years War; technology wizards.

The Vintons: Swedish miners/metalworkers employed by Hoechstetter.
Brought north to Keswick copper mines but also worked in the Derwent Valley.

Wilhelm Berhtraban: (Bertram) German smith, iron and steel producer.
Born Remscheid; sword-smith and superior steel-worker in Wira Bruk, Sweden.

Adam Ohlig: sword-maker from the Wupper Valley in Germany.
Born to a line of master forgers and Lutheran preachers. Head of the diaspora.

Harmonn Mohll: German mills owner in Solingen and Shotley Bridge.
Autonomous: not in a Guild, never under contract to the syndicate; smuggler!

Thomas Carnforth: sword-cutler with shop on The Side, Newcastle.
Would buy the blades and add the hilts, often having goldsmiths embellish them.

John Sandford (Sampford): Newcastle goldsmith; syndicate member.
Uncertain full provenance, but landed gentry from Scottish borders. Possibly a Jacobite.

Sir John Parsons: London brewer; excise officer; 1st syndicate member.
Mayor of London; Sheriff of London. Closely connected to King James II.

Peter Justice: London goldsmith; 1st & 2nd syndicate member.

Earl of Derwentwater: a Dilston Hall Radclyffe; very important Jacobite.
Estates bordered Shotley Bridge village. Organised the 1715 rebellion. Executed 1716.

Sir Stephen Evance: London goldsmith/banker; 2nd syndicate governor.
Helped finance the Glorious Revolution that put William and Mary on the throne.

Dan Hayford: Yorkshire businessman, involved with local forges.
Sold iron to the Germans; took over and developed local forges, built new ones.

William Cotesworth: successful trader, agent, then manager for Company.
Eventually owned the village works and contracted the workers.

Sir Ambrose Crowley III: iron & steel producer with local manufactory.
Major government supplier. John, his son and successor, was a prominent Jacobite.

Getting Started

In 1993, I began amassing a collection of books by Frank Graham – a Newcastle publisher of predominantly local history – having returned from many years abroad with a vigorous interest in my Geordie heritage. One of Frank's books was called *The Swordmakers of Shotley Bridge* by David Richardson (a descendant of the principle protagonists). The village was a mere thirty minutes' drive away and the book told a story that fired me up with enthusiasm, a seemingly unresolved local history adventure.

I'd never knowingly been to Shotley Bridge and, as Richardson's book was from 1973, I was curious to see what remained extant two decades later. Big disappointment: the much mentioned Crown and Crossed Swords pub was there, but nothing else was immediately apparent – to an outsider anyway. The folk in the pub said it was all just vague ancient history, some of it a folktale at best. There were certainly no swords to be seen.

Change of tack: the sword on the cover of Richardson's book belonged to The Society of Antiquaries based at Newcastle Keep; that was my next stop. I had not entered The Keep for decades, but once I discovered that the Society was housed in the main room of the Black Gate (the western entrance to the castle compound) and had been since 1883, I headed there. You simply walked off the street, through the barbican, and into the courtyard; but, once there, it was not immediately obvious how you got into the main guard-rooms above the gate. I was standing there pondering when an elderly gentleman appeared out of nowhere carrying a red plastic watering-can!

Curiouser and curiouser.

Appearing to ignore me, he went to a stand-pipe in the corner of the courtyard and filled the watering can. As he turned to return he perceived me pondering and asked if he could help. I told him I was hoping to see the famous Shotley Bridge sword. He shook his head, he knew nothing about it, but perhaps some of the others might – so follow him up to the library.

Right: the Black Gate.

Entering a large room above the gate I felt I had gone back 150 years; it was like a classroom in Hogwarts! Now I don't mean to be disrespectful here because this society is a most venerable institution that has unearthed, recorded, protected and preserved so much of our precious local history it has a library of its own to catalogue its achievements. However, back then there was not a soul in that place younger than the 12th century castle itself. Bookshelves lined the walls from floor to ceiling, and books as old as the city were gathering dust in haphazard piles on a huge table, yards long, that occupied the majority of the room. The red plastic watering can?

"Splash of milk, no sugar – thank-you".

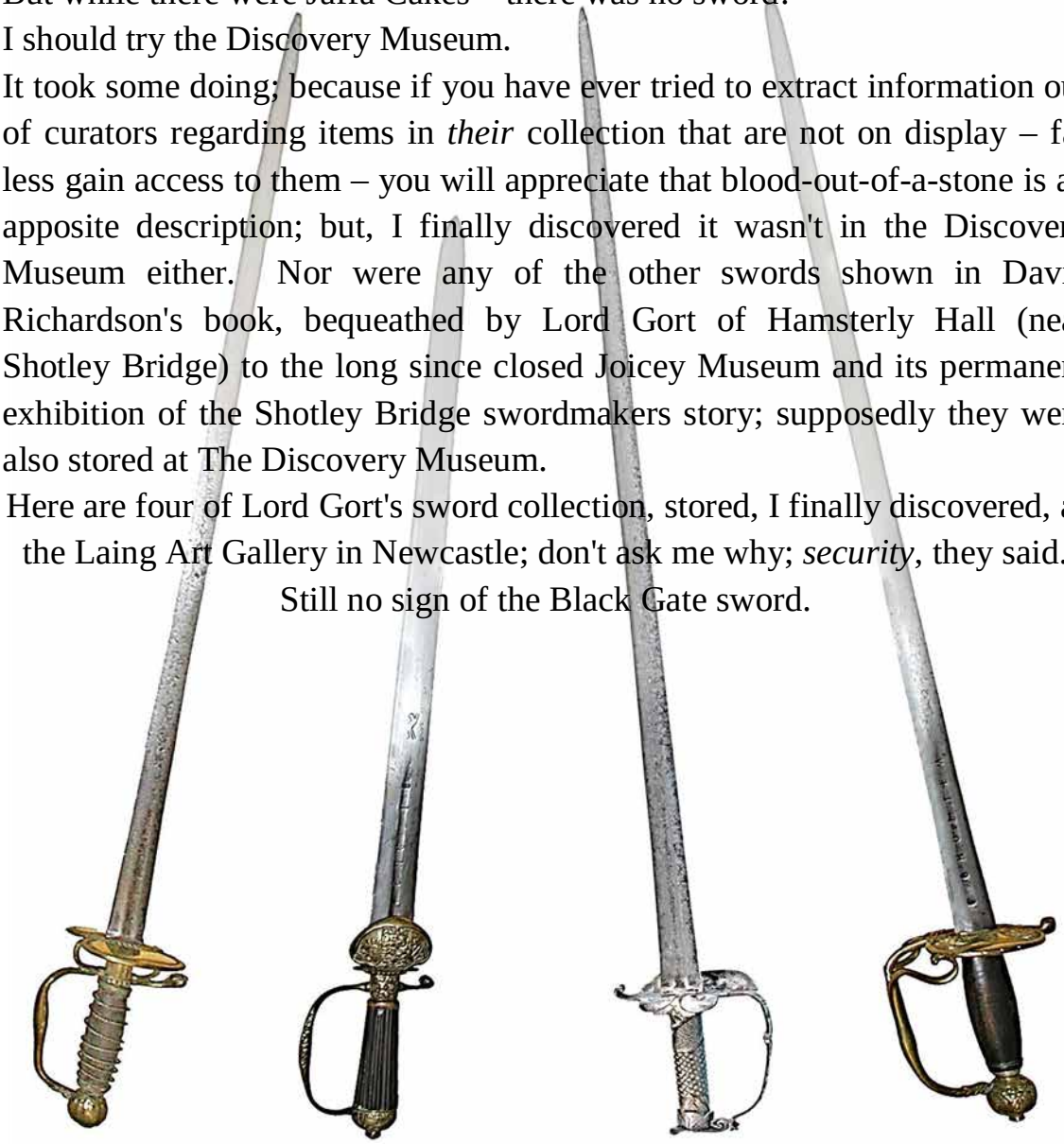
But while there were Jaffa Cakes – there was no sword!

I should try the Discovery Museum.

It took some doing; because if you have ever tried to extract information out of curators regarding items in *their* collection that are not on display – far less gain access to them – you will appreciate that blood-out-of-a-stone is an apposite description; but, I finally discovered it wasn't in the Discovery Museum either. Nor were any of the other swords shown in David Richardson's book, bequeathed by Lord Gort of Hamsterly Hall (near Shotley Bridge) to the long since closed Joicey Museum and its permanent exhibition of the Shotley Bridge swordmakers story; supposedly they were also stored at The Discovery Museum.

Here are four of Lord Gort's sword collection, stored, I finally discovered, at the Laing Art Gallery in Newcastle; don't ask me why; *security*, they said.

Still no sign of the Black Gate sword.



I abandoned my endeavour, but it remained an itch I couldn't scratch until fifteen years later when I received a request from a friend who writes books and gives illustrated lectures on local history and heritage. Yvonne Young stimulated my waning enthusiasm when she asked me to suggest a subject she could talk about specifically at men's clubs and societies. The first thing that sprang to mind was the Shotley Bridge swordmakers; I gave her David Richardson's book to read.

I walked right into a trap because she quickly came back with a further request to precis the story into an hour long lecture with suitable pictures to display. But it seemed mutually worthwhile, so I set-to and collected all the available books, essays and texts I could find on the subject.

If anyone has read anything about the Shotley Bridge swordmakers, then this is almost certainly what they will have read:

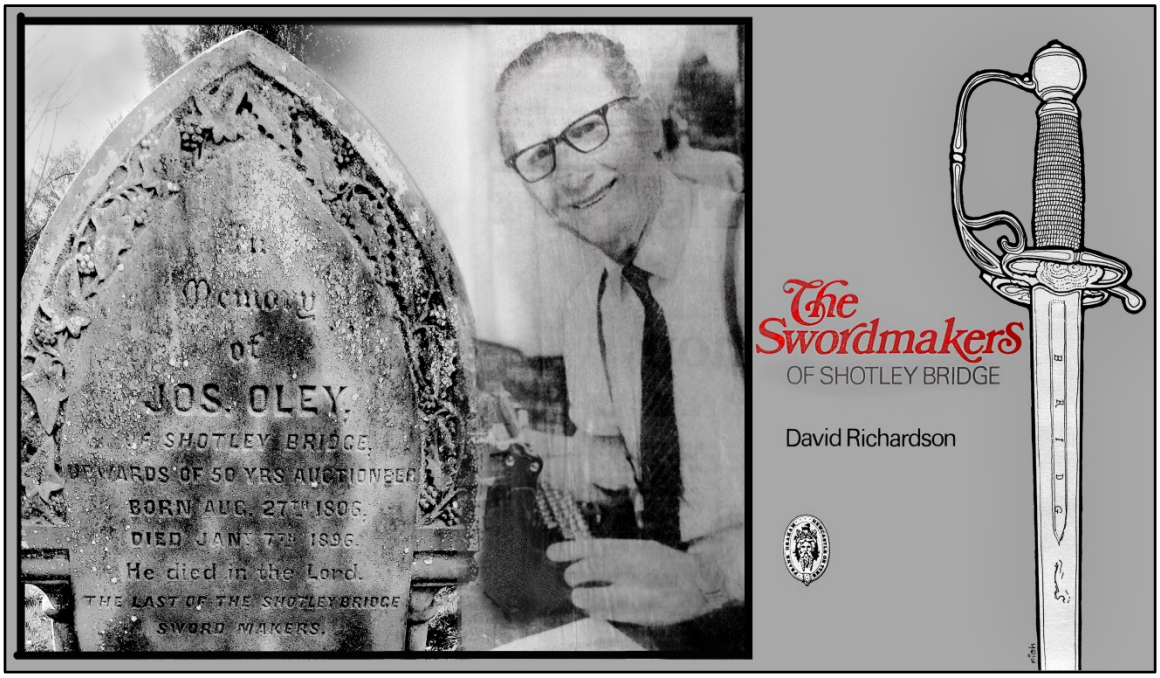
> "In 1687, led by Herr Olligh and Herr Mohll, twenty German families arrived in Shotley Bridge. They had fled their homes in Germany due to religious persecution. Being blacksmiths, skilled in the manufacture of sword-blades, they had broken the oaths of their guilds by deserting their brethren and possibly divulging the secrets of their profession to outsiders, so were considered criminals back home; physical punishment was due; homes and possessions were to be confiscated.
>
> They were brought to England by a syndicate of London businessmen in order to use a secret machine to manufacture fashionable civilian dress-swords, for the aristocracy and gentry of Britain, at a much reduced cost than currently prevailed.
>
> By the mid. 1700s, their village endeavours had dwindled to nothing; Birmingham arms manufacturers had taken center stage in the industry and most of the Shotley Bridge families had dispersed into alternative professions elsewhere; those that remained allowed the business to decline until by the end of the 18th century all was lost.
>
> By the end of the 1960s all physical trace of their existence within the valley had been eradicated.
>
> Add in peripheral tales of political and commercial intrigue regarding the London syndicate, and one seemingly unresolved instance of smuggling – possibly treason – at the mouth of the Tyne, and a century from the beginning their story is complete."

Consequently, this seemingly insignificant enterprise has been forgotten by the wide world… even the wide world of Tyneside. Yet equally, it has been the subject of pages and pages of essays, newspaper articles and books written by generations of enthusiasts and academics who have, for the most part, simply repeated what had been proposed by earlier chroniclers, right up until the new millennium when, thanks to our modern research facilities, previously unrevealed realities have come to light.

Once I embarked on this journey I rapidly realised why the same story had been told over and over. Mr. Richardson had done a phenomenal amount of research at a time when it was all done the hard way and, while some of his conjecture began to fall apart as I dug deeper and deeper, his book concisely laid-out all the groundwork for me to follow. In mitigation, he was trying to tell a story that had been deliberately obfuscated from the beginning, with subterfuge beneath deception hidden behind façade, so it is no wonder those other chroniclers cut short their labours and re-told the common story I outlined previously. David Richardson was extremely thorough, and *his* was a true labour of love, which is unsurprising considering he was writing his own family history; his grandmother was an Oley. Oleys and Mohlls were the principle protagonists at the very beginning – and right at the end.

In truth, what remained to be discovered was a story of global proportions that virtually spanned millennia.

Below: Ebchester gravestone of Jos Oley, and descendant David Richardson.



Why Shotley Bridge? A tiny village, nestled half-way up a tributary of the River Tyne in North-East England, with Northumberland on one side of the river, County Durham on the other, and Newcastle's Port of Tyne close-by. At that time it was no-more-nor-less significant than every other little village in the British Isles, except perhaps for its surrounding lead, iron and coal reserves, mature forests and plentiful millstone grit.

In the grand scheme of things it was invisible to outsiders; if you didn't know it was there, you definitely wouldn't know it was there. Most Newcastle folk were unaware of its existence (still are; take away road signs and sat-nav and you will never find it), Durham City folk more-so. Even Border Reivers and Moss Troopers overlooked the place; yet at the end of the 1600s this village would become the focus of religious, political and commercial events that went on to spawn industrial complexes which, at both ends of the valley and at both ends of two centuries, were the biggest and best in the world, plus one of the biggest financial disasters in history.

We can thank Queen Elizabeth 1st for the conception and Margaret Thatcher for the termination, but mainly we can thank the invading German swordmakers who would occupy the village for 200-plus years.

What were they doing *there*? Out of all the equally suitable locations around the country, some seemingly far more suitable, why did they go there? Even after you know why they went *there* you still don't know *why* they went there. You are not alone. For over two hundred years historians and chroniclers have tried to unravel this mystery, then simply skirted around it by telling the same much regurgitated story once again.

So when I started to chronicle this affair my first question was: "Why Shotley Bridge?" Surprisingly, it became quite obvious, then more-so; then, after some years of research, the entire picture started to come into total focus. While it is essentially a tale that I am telling, it is also a repository of all the information that I have collected on the subject; as a result, there are parts that will tax the attention of some readers… sorry, but it needed to be done because I wanted this to be the definitive history of the Shotley Bridge swordmakers… and I feel I have succeeded. **KF**

The Dutchmen are coming!

There had been much activity and rumours, rumours the Dutchmen were coming! It must have felt like an invasion: foreign accents, occupation of property – not that there was much to grab. 'Witch' Jane Frizzle ranting, cursing-all from her Crooked-Oak house. 'Mad' Maddison on the prowl, most days, some nights too; woes betide those who came near him. Something must be done soon: "Hang-im!" said most… so they did!

It was an invasion! A dozen foreign families descended on a village of no more than that number. At first it was thought they were Dutch – it was said they had arrived from Rotterdam – but no… Deutsch! Not Dutch… they were Germans! The rumours had been wrong! What were Germans doing in Shotley Bridge? What were the Germans *doing* in Shotley Bridge?

They already had one foreigner in nearby Allensford, but William Bertram had come from Sweden. Accepted by all, he was no trouble; brought work and money into the village… he was no trouble. Were the Germans going to make trouble or make money for the village? They had heard about invading German miners in Cumberland many years ago, heard about the trouble they had caused… but also the money they had made for the locals!

Wealthy individuals had been seen hereabouts: outsiders, men of obvious importance holding meetings with local lairds, acquiring land and property at the behest of the Germans. What *were* they up to?

What began in the days of Henry VIII, which resulted in an affair that became famous in all English speaking countries, was the true beginning of the Industrial Revolution – not the 'Machine Revolution' that came one hundred years later. This would decide the fate of the Derwent valley for over three hundred years.

Although the seeds of this affair were sown by Henry VIII, they were propagated here at the behest of King James VII/II. However, regardless of who wore the crown, world-class bladesmiths would labour unremittingly, untainted by the commercial greed that nearly brought down a government, but gave rise to the beginning of Tyneside's heavy industries.

The fables and myths associated with those Lutheran blacksmiths have for centuries disguised an enterprise of religious and political purpose hidden behind a complex façade of commercial machinations and the bling of 17thc. men's fashion. Where was the truth to be found?

STEEL

This tale begins as early as 500bCe in both nearby Iberia and far-off Sri Lanka, then re-appears during the Christian Crusades in the Middle-East. From then, and there, we have a list of significant players and events throughout the last 800 years: English king Henry 8th; English queen Elizabeth 1st; English king Charles the 1st; our civil war; English kings Charles 2nd and James 2nd; the Glorious Revolution; The South Sea Bubble; the birth of the Industrial Revolution; Wilkinson Sword; and finally British Steel; then it comes to an end with the death of British Steel under Thatcher, followed after a decade by the end of Cramlington's Wilkinson's Sword.

While swords have remained a constant, vital and profuse feature of world history and mythology, the tales of their manufacture from earth's raw elements remains, at times, equally fantastic. According to a curator of the Metropolitan Museum in New York, legend had it that the best blades were quenched in "dragon blood". However, a little closer to reality, in a letter to the museum, a Pakistani gentleman told of a sword held in his family for many generations that was quenched by its Afghan makers in donkey wee. This concurs with some medieval blade-smiths over here who recommended the pee of redheaded boys, or even more realistically, from "three-year-old goats fed only ferns for three days".

Were scientists to analyze these bodily fluids, they may well discover the presence of elements pertinent to metallurgy; then again, they may not have the time, nor the inclination, to start breeding goats… or red headed boys!

Production of metal suitable for sword-blades has been the stuff of legend throughout world history, with both supernatural and superhuman reverence attached to the masters of the science. Celts around the North Sea claimed they learned this science from "The Hidden One": an underworld god (page IX of the supplementary section in the rear). Their skills migrated south and c.500bCe they were producing superior blades in Toledo, using a process known as 'Billet Welding' i.e. forging together different metals to create neither brittle nor deforming blades. It appears this science continued to be used in Briton until the arrival of the Normans. Bamburgh Castle holds just such a blade: made of multiple strands of billet welded metal dating to c.600Ce and found in the castle grounds.

Reference: https://thehistoryofengland.co.uk/resource/the-perfect-sword.

At virtually the same time, in Sri Lanka and southern India, superior steel production existed using a water-melon shaped clay crucible filled with iron, rice husks, pomegranate peel, wood chips and fresh leaves. Using tent-like funnels to direct the hillside winds into the furnaces, it was heated until the ore melted and the carbon from the organic materials was evenly distributed. The result was "cakes" of Wootz. That was just the beginning though: the secrets of forging them into blades was complex to say the least.

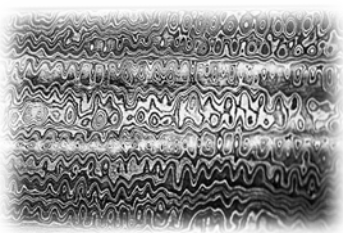
Along with the cakes, Wootz techniques were exported along the Silk Roads into the Middle-East, where very fine blades were encountered during the Christian Crusades and the Knights of St. John brought Solingen bladesmiths out there. Concomitantly, Germans, such as Adolph IV of Burg, took advantage of this opportunity and brought Damascus smiths to Solingen. As a result, by the 1300s, blacksmiths in Solingen were turning out superior blades – not by using wootz steel but by using local ores and exceptional skills that would endure for hundreds of years.

Much debate attends the issue of Wootz versus Damascus: superficially, the appearance of the 'watered' effect in the steel that we associate with Damascus is a product of billet welding and not Crucible production (see below). This is not a subject I will attempt to discuss here; you can find a fantastically comprehensive film on Youtube: '*The Secrets of Wootz Damascus Steel*', and an essay on page 108 of this book's addenda.

Very simply put, if such a thing is possible, Wootz is now understood to be an eutectoid steel, and modern analysis tells of the presence of carbon nanotubes enclosing nanowires of pearlite, with trace elements of vanadium, molybdenum, chromium et al. contributing to the creation of a hard, high-carbon steel that could remain – and this was the vital factor in sword-blades – elastic, provided it was treated correctly in the forging process: get it wrong and you end up with brittle blades, or worse, junk.

In 1744, this 'Crucible Method' finally reappeared – in Sheffield, Yorkshire – when Doncaster clock and lock-maker Benjamin Huntsman would, in search of a perfect main-spring, discover and develop the process but, paranoid and guarded to the end, not patent it!

Left:
Wootz blade.
Right:
billet-welded blade.



Royal Almain Armoury

Most people think of Henry VIII as that huge, barrel-bellied fellow who had to carve out a chunk of dining table to get at his food. What most folk don't know is that in his younger days he was not only a scourge of the Lists, but a well-developed, all-round, battle-ready monarch. Unfortunately, a badly repaired leg injury continued to fester all of his life reducing him to a virtual cripple. More than most he was aware that the finest suits of armour came from abroad and were not home-made. Rather than continue to commission work from over-seas, he brought skilled German, Flemish and Italian armourers over here and established the Greenwich (or Almain) Armoury around 1511. He rather naively expected these craftsmen to share their secrets with English workers. Their work for the aristocracy remains unsurpassed in this country, for example:

Jacob Halder, who was born and trained in Landshut Bavaria, is first recorded at Greenwich in a list of Almains about 1557. He brought a strong German influence to the decoration of armours. During his tenure as Master Workman, Halder also produced a full-colour album illustrating and labelling all the decorated armours made at Greenwich.

(*Below*) Tournament armour by Jacob Halder 1576-1608; images courtesy of the Royal Collection.

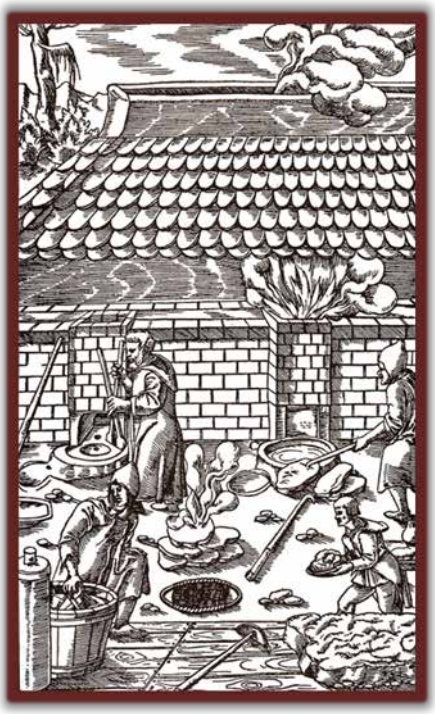
Miners to Newcastle

Our lack of ability in the blade-smithing arts is certainly a disappointment; but, realising that we Brits were not good miners comes as a sad surprise too-far. It's hard to believe that anything other than a 'bell-pit' or 'drift' was beyond us, when the Swedes and the Germans had successfully mastered and developed that industry.

Daniel Hoechstetter was a leading minerals surveyor and mining engineer in Bavaria, which was the European center of armour production. Henry VIII had failed to get Daniel's father to come over but, in 1563, Daniel came over with his 'Ingenious Artisans' (men well experienced in metallurgy and mining) at the request of Queen Elizabeth, to find, then mine and refine anything of value… nationwide – especially copper.

A mine at Keswick in Cumberland, known as Gottes Gab' or God's Gift (now Goldscope), was so successful, yielding such vast amounts of copper, silver and gold, that the 7th Earl of Northumberland who had been given Cumberland by Queen (Bloody) Mary demanded that the profit of the mines should go to him (seemed reasonable). He challenged Queen Elizabeth as to her right to take metals from *his* land; *She* was not amused, so a judicial review known as The Battle of the Mines Royal was set up to decide who got what. Percy lost the legal battle. Further aggrieved by his commanding role in the Rising of the North, Queenie had Percy's head chopped off. (see page 100)

Below: Mining copper. *Right*: Blast Furnace.



Hounslow Hangars.

In 1629, Charles 1st was the next monarch to import German metal-workers when Sir John Heyden, his Lieutenant of Ordnance, was sent to Rotterdam where German craftsmen were met and commandeered. Schmielden (forgers), Schleifen (grinders), Härter (hardeners) and Feger (polishers) were persuaded, by royal request, to come to Hounslow in England and set up sword-blade manufactories. Johannes Hoppie (the younger) moved from Greenwich to the new site. Peter Munsten (the younger), Johann Kindt, Caspar Karn, Clemens Meigen, Clemens Horn (the younger) and Caspar Fleiseh all came from Solingen, set up blade works and signed their blades ME FECIT HOUNSLO, 'I was made in Hounslow', sometimes adding names and a Passau Wolf *(a wolf did not always mean the blade was imported)*.

A typical Hounslow Hangar; *(see page 91 for a further selection of Hounslow swords*

More smiths would subsequently appear at Hounslow, in particular Joseph Jenkes (1635), Johannes Dell (1649), and Peter Henckels von Wustenhof (1660). London born Jenkes signed his blades IENKES while working for English businessman Benjamin Stone. We have a submission from Jenkes to the Earl of Northumberland in 1639; Northumberland was petitioned because the river that powered the mills is actually a man-made canal, dug to supply water to Northumberland's estate, Syon House (extant). Parts of the petition (in the Duke of Northumberland's archives) read as follows:

> To the right honourable Algernon Percy, Lord High Admiral of England, Earl of Northumberland, on August 7, 1639, to "…graunt unto him a smale peece of worst ground upon the Isleworth River at Worton Bridge to sett up a smale shedd or workehouse…"
>
> On that small piece of ground, Jenkes proposed to build "…a new invented engine or blade mill…" and shrewdly pointed out that "…there is never an Englishman in the kingdome that cann use that profession but himselfe except the Dutch: (Deutsche) and he hopeth by this meanes to raise upp more English to the same Trade, and that wee shall not have hereafter so much need of Strangers, wch wilbe a further benefit to the Comon Wealth…"

Here we have that common instance of using the promise of teaching the English smiths the secrets of the German profession; this had not happened at Greenwich and *would not* happen until Oleys and Mohlls moved to Birmingham and Sheffield. Of far greater importance was that we have mention of a new secret engine, or blade mill, a machine that was around as early as the 1630s; what exactly was it?

This is one of the questions that remained fundamental to the entire account.

Jenkes (of German ancestry) was born into a family of cutlers in London, England and became a member of the Guild of Cutlers. When his wife, then his young daughter died, he left his son behind – who would join him later – and sailed to Lynn, Massachusetts, North America. Here he set up a foundry and forge at the site of America's first 'integrated iron ore industry', and in 1646 was granted the first machine patent in America for a 'new kind of water-driven machine to make scythes, sawmill blades and other edged tools…' Here's that machine again! I indulge this Jenkes history because of that machine and because of Lynn which became the home of another important family in this story, the Vintons from Sweden, who would establish an exemplary career in the metal forging business over there *(see page 136)*; at this time it would appear the Vintons were already working in our Derwent Valley.

Benjamin Stone, with his enterprise at Hounslow *(for more details see page 89)* was a major supplier of hilted swords, scabbards and belts to The Tower until civil war began when Stone, along with several German smiths, followed the King to Oxford and continued working there at two locations: Gloucester Hall and Wolvercote. Cromwell subsequently converted some of the deserted Hounslow sword-mills to gunpowder-mills, but obviously not all – he needed swords as well; in 1655, a John Cook petitioned the Council of State to encourage his manufacture of hollow-ground smallsword and rapier blades at a mill in Hounslow. This is early in the history of such blades; plus, who was working for him who was capable of making them?

When studying swordmaking history it is easy to consider Solingen to be the center of the universe, and back then it probably was; but… it had become inundated with skilled and unskilled Huguenot refugees, and was still just a guild-controlled, small town industry in a fragmented Germany. London was quite the contrary and an attraction for those Germans looking to get-on in life – such as our illustrious and essential Johannes Dell.

What is known: Dell was born in Solingen in 1624 and moved to London in 1640. By 1649, three years before the end of the civil war, he is known to be working in Hounslow as a grinder (Schieffer) and signing his blades:

∴ IOHANNES∴DELL

He will have been serving an apprenticeship during those years through the war when demand was obviously at an all-time high and he may well have taken over a mill when Risby retired in '49 and been John Cook's supplier. By 1660, he was joined by Peter Henckels – blade grinder from Solingen. One thing *is* known about his career ascent, he was no longer Johannes Dell, he became Johnathan Bell, then John Bell, and was simply the right man in the right place at the right time, because Hounslow Heath had become the martialling grounds for the King's new 'standing army'.

Epée de Jour

When King Charles II and his brother returned from their European exile for the restoration of the monarchy they were, in the latest Continental fashion, wearing a style of sword known as a smallsword which was attended by a new style of fencing. It was a very different blade to any that had gone before: it was very short and light with no cutting edges, far lighter than battlefield blades, far shorter and less unwieldy than rapiers which were a cumbersome nuisance during civilian wear; here was a lightweight and very fast weapon that was deadly in skilled hands.

It was understood, in France especially, that a significant stabbing was most often lethal, whereas a slash-wound was not. It took us a while to catch-on to this until British field surgeons reported that the French wounded often survived, whereas the British did not, as the surgeons were unable to get into those stab wounds to repair and/or cauterize.

The rapier had been the beginning of this approach, and that fighting style was the forerunner to that of the smallsword. Most civilians wearing a rapier gradually progressed to a smallsword as the rapier went through a 'transitional' stage with a shortening of the blade and a simplifying of the hilt (see illustrations page 17).

It had not been unusual for a smallsword hilt to be seen on a slim broadsword blade; the first smallswords marked Shotley Bridge used just such a blade. Reasons vary of course, but in Scotland and the north of England, there was a tendency to regard these new hollow blades as ineffectual. No cutting edge and no weight were the two main objections, but also perhaps a difficulty in finding teachers of the new discipline. This had actually been the case with the arrival of rapiers, and there were combinations of rapier hilts with short, heavy broadsword blades. Equally, right through the 1700s, slim rapier blades with smallsword hilts then court-sword hilts were not uncommon, especially on the Continent, in Portugal and Spain in particular, where fine quality, valuable rapier blades were profuse (on page 17 is a court sword hilt – rapier blade marriage).

Over the centuries, the term smallsword has referred to all the variations on this theme, but the classic version is by far the most complex in construction and eluded the abilities of all but the Solingen masters who, over the years, spread far and wide fulfilling the demand for this elegant weapon.

In order to fully understand this issue this brief visual depiction of the actual blade shape is required. It is referred-to as a hollow, trefoil or triangular profile, with concave faces. The three edges are unsharpened but it tapers to a very sharp point.

However, as you can see, the radius of the hollows decrease as the blade tapers to its point and this makes it virtually impossible for any kind of 'one-pass/single-operation' machining to take place. Recent conversations with professors of engineering have convinced me that, even today, it is not a feasible proposition. So, the stock was forged into a basic flat-faced triangular shape, then the hollows were stamped-in using a mould cut into the surface of the anvil to create two hollow sides, and tools known as fullers (now 'formers') hammered down on the upper face of the stock to produce the 3rd hollow. Once this was done the surfaces were smoothed and trued using a variety of hand-files. Eventually, the name *fuller* became associated with any groove or hollow in a blade. (Below: files and fullers.)

This process was not new: long-swords known as Estocs, in use as early as the Middle-Ages, were produced using the same principle. *They* were utilitarian, armour piercing weapons, carried at the forefront of the infantry, so didn't require delicate finishing, but the basic form was the same. We still used this same process mid.1800s to forge Brown Bess bayonets.

So what was this machine? Some knowledgeable folk have suggested it might have never existed and was only a mythical promotional effort with, in reality, a massive work-force labouring away in the background. A very reasonable proposition – but partly wrong, because it did exist, and it did come to Shotley Bridge with the 1687 invasion, courtesy of the Mohlls; with huge labour forces available the Solingen guilds were pleased to be rid of anything that deprived their home-grown skilled workers of a living.



Above left is a luxurious 'swept hilt' rapier with 41" blade.

Above center is an elegant 'cup hilt' rapier with a 40" blade.

Above right a 'transitional rapier': early smallsword hilt, 36" rapier blade.

Below: 1600s Dutch smallsword with a 28½" Solingen blade.

This slim bladed, ambidextrous sword was popular for duelling.

Below: Classic silver-hilt smallsword with a 31" engraved blade.

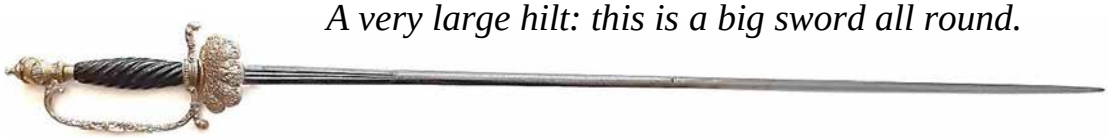
This is a typical French 'hollow-blade' smallsword c.1750.

Below: Regulation of April 1767 French officer's sword.

Battlefield variant; 36" flattened oval blade with both edges sharpened.

Below: late 18thC. court-sword hilt on an early 17thc. 40" rapier blade.

A very large hilt: this is a big sword all round.



Below: 19thc. court-sword with 31" blued/gilt (Ormolu) hollow blade.

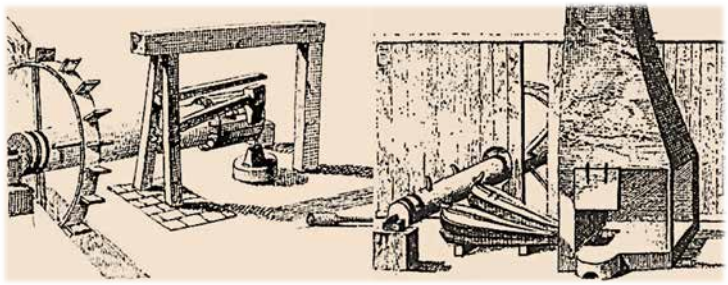
The 'cut-steel' hilt will be from Matthew Boulton in Birmingham.

Today, the *defining feature* of "the smallsword" remains the style of hilt. Looking at the images above it is apparent that this was very much a new design that began with the transitional rapier, then settled into the bilobal shell-guard, branches or pas d'âne, quillon block/quillons and single knuckle guard. The size and weight varied depending on the blade, because a wide variety of blades were utilised according to taste and purpose, but…

The crucial aspect of the classic new smallsword – invented in Solingen – was that triangular blade, hollowed on all three sides, thus reducing the weight, but maintaining rigidity, and tapering into a needle-sharp point. It gave rise to a new style of fighting which featured a fast stabbing attack; this all required a serious outlay of funds to pay for a new sword *and* new lessons. Of course, every Gentleman had to have one, regardless of whether he had bothered to learn how to use it – or not, because this was what the King was wearing when he returned for the restoration.

A heavy import duty, plus restrictive quotas on German blades, adding to the cost of a suitably extravagant silver and/or gilded hilt, meant it was a big chunk of change for even a well-off Gentleman-about-town. A typical example was Joshua Geikie of the Inner Temple writing from London to his friend William Cotesworth of Gateshead - "Can't get a handsome sword for £5 or £6, so have ventured to £8 10s .... " That is 30 days' pay for a skilled labourer back then or close to £2,000 today; something needed to be done. (*I mention Cotesworth because he will feature prominently later-on.*)

Germany had reputedly developed a machine for fashioning the complex shape of the blade hollows in one operation which would obviously cut down labour costs enormously. However, in the case of much mentioned machines or '*engines*', it has also been suggested that the early use of the term simply referred to the entire waterwheel driven apparatus powering bellows, trip-hammers and grinding wheels, and may not have always described the new technology to produce a hollow blade in a single pass, even though such a device had existed in Solingen since the 1630s.

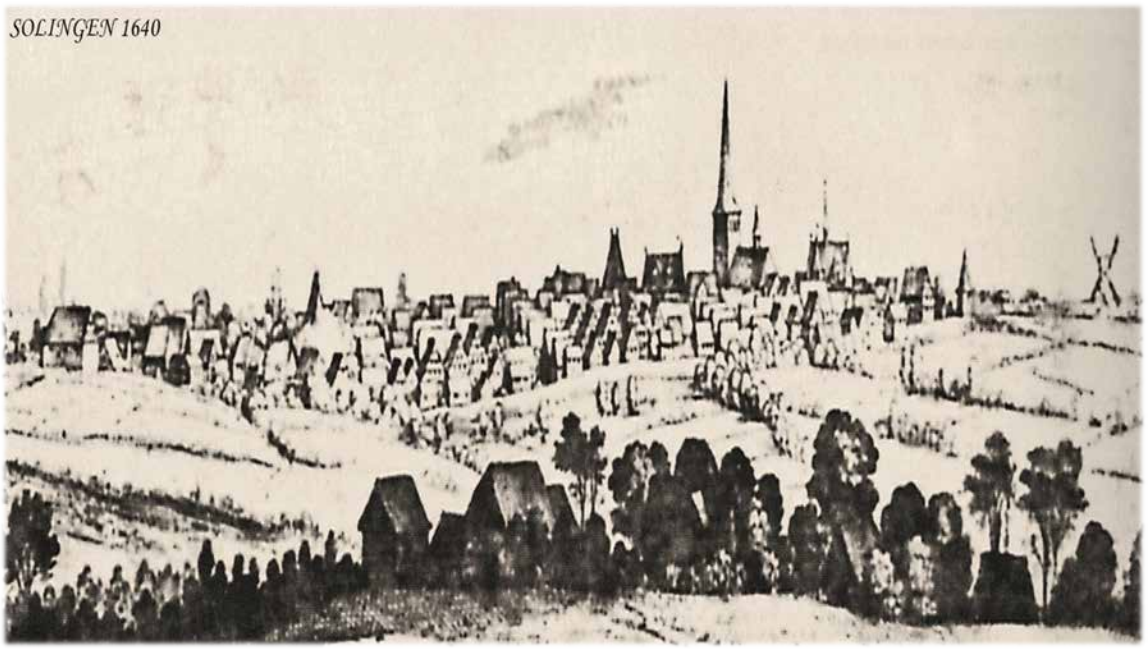


A subject of huge contention amongst those with an interest in this affair is what was this 'secret' machine all about? Many references had been recorded of various individuals proclaiming a secret machine and the exclusivity of ownership and/or understanding. Throughout its history it has been described as having numerous mechanical properties but ultimately always for the rapid and efficient hollowing of the faces of a trefoil smallsword which used to be a time-consuming and laborious hands-on endeavour exclusive to Germans.

We Brits were not skilled in making even common-or-garden battlefield blades (why? remained an unanswered question) so we stood no chance of making these technologically complex, skilled-labour-intensive, hollow-ground blades, and we had to import them from Germany with heavy import duties on limited quotas intended to protect our own sword industry.

As it happens, Solingen was not at all happy about machines; they were Luddites to the core. Apart from this natural aversion, the locale also had to deal with a huge influx of Huguenots (some say as many as 30,000) on the run from French kings. Many of these people possessed exceptional skills in various trades and crafts, but even the ones that didn't were still saturating the casual labour market; the last thing the guilds needed were machines reducing man-hour labour.

However, there is no doubt that machines existed in Solingen by about the mid. 1600s, and the question I asked was: who owned them?



King of Swords

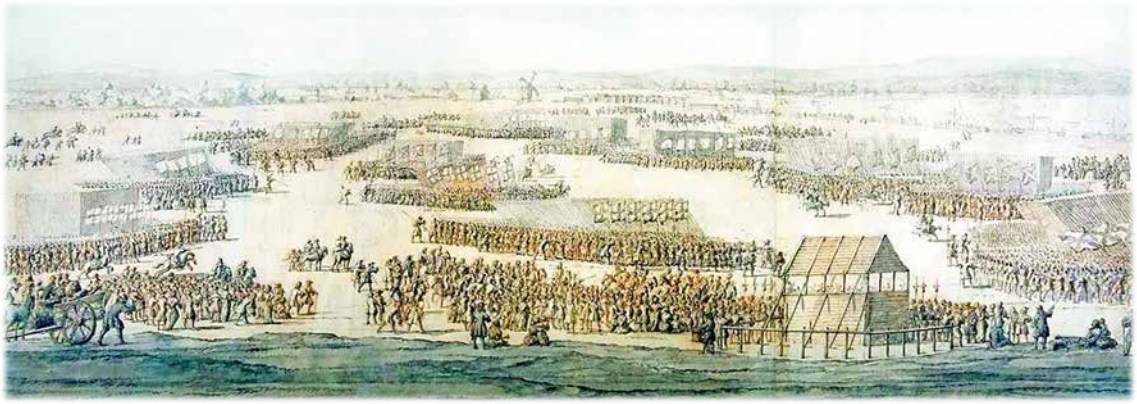
In 1621 James 1st had to arm 12,000 men to fight in the Thirty Years War. Three years later he still needed 5,000 swords every month for his army, and the Tower was forced to have the Cutlers Company of London purchase blades from Germany. Later, William 3rd had to arm 100,000 men to go and fight the French. In the 'Oley Timeline' (page 75) there is a list of all the wars the British fought during the 18th century using swords to varying degrees… there were a lot!

In 1661, our restored King Charles II assembled four regiments of infantry and cavalry, calling them his guards, at a cost of £122,000 per annum paid out of his regular budget. By 1685 it had grown to 7,500 soldiers in marching regiments and 1,400 men stationed in garrisons. This became the foundation of the permanent British Army.

In 1673/4 he was determined to establish a high class sword manufacturing industry in England, but cheap smuggled imports swamped the market and it didn't materialise; nothing is known as to the source of the skilled labour he intended be used, but we can safely assume, as before, it would be Solingen.

The lack of legitimate heirs from Charles caused grave consternation amongst those Protestant ruling classes outside of his supporters. The possibility that James would become king – a Catholic king – led to attempts to assassinate them both, in particular on one occasion in 1683, when the failure of the Rye House Plot led to imprisonments, banishments, tortures and executions; this was known as the 'Stuart Revenge' for their father's execution – although that term is contested academically.

Following the death of his brother in February 1685 and his accession to the throne, James was challenged by the Duke of Monmouth over his right to the crown. After he had chopped his illegitimate nephew's head off, James seized the opportunity Monmouth's rebellion offered to create a Catholic standing army loyal only to him. When he fathered a son, thus ensuring the perpetuation of a Catholic crown, he was in real trouble. He raised new regiments officered by Roman Catholics to protect him against what appeared to be incipient revolution – and refused to disband them. By October 1685 his army of 20,000 men were exercising menacingly just outside of London on Hounslow Heath. The following illustration shows just such an exercise: The Grand Review 1687; a portentous time and place.



The makeshift grandstand (lower right) indicates that the king is present; his flags of St Andrew and St George can be observed – which in itself was great cause for concern to Parliament. James needed a lot of weapons to supply this army, *plus* those of his supporters and their militia around the country – but, apart from expensive imports and poor quality English product going to the Tower, there was only one German worked swordmill still running on Hounslow Heath: that of Johannes Dell.

While many more German smiths were needed it was not deemed practical or wise to bring them to Hounslow. The Standing Army was supplied openly from The Tower, but the unofficial army i.e. those undisclosed, wealthy, powerful Jacobites and Catholic recusants scattered around the country, but predominating in Scotland and the Northern Counties, would have to be armed surreptitiously from a suitably inconspicuous location, and this is when Johannes Dell/Johnathan Bell/John Bell came on-board. A cunning plan was about to unfold, and its impact would reverberate down the Derwent Valley onto Tyneside for 300 years.

Paraphrased extracts from the Worshipful Company of Cutlers internal history:

In 1686 The Cutlers Company approached Lord Dartmouth (the Master-General of the King's Ordnance) with a plan to control the derogatory trading of sword-blades by confiscating imports (hawkers and peddlers were smuggling in huge quantities of foreign made blades), and restricting the use of foreign workmen in England (the French kings' relentless persecution had, like Solingen, saturated London with Huguenot workers).

The Cutlers Guild hoped Lord Dartmouth would procure a Royal Patent from James II giving them the powers to control the swordblade trade; Dartmouth appeared enthusiastic about the scheme and the Company expressed their gratitude to Dartmouth in follow-up letters.

Within days of these letters being sent the Cutlers Company were opposing a Dartmouth revealed plan to produce hollow swordblades with a secret machine: a scheme that would result in the creation of the Hollow Swordblade Company in Shotley Bridge which by then was already underway. Dartmouth (a staunch Jacobite supporter) was informed by the Crown of the new syndicate with their imminent Shotley Bridge endeavour; a hand-ground hollow blade from Francis Troulett of London had been presented to Dartmouth alongside a German 'machine-made' example for comparison. *Where did that machine-made blade come from?*

We now know that northern Jacobite militia were to be supplied surreptitiously with battlefield blades, but there is no indication that an arming of the country's official militia – via The Tower – by the Shotley Bridge works, was actually part of the grand plan.

The Shotley Bridge syndicate had petitioned King James II for a patent granting them exclusive right to manufacture *hollow sword blades* in England with their secret mill. The petition stated that they had brought foreign workmen from Germany to England and proposed to make use of a mill unlike any other in the king's realm. The petition was referred by the Privy Council to Lord Dartmouth who referred the petition and examples of the machine's product to John Hawgood, Master of the Cutlers Company, hence the Cutlers Company's opposition to Dartmouth's plan.

It would, of course, all change when William took the throne and control of the syndicate passed to Stephen Evance, who had helped finance the Glorious Revolution for William. With the change of management, Shotley battlefield blades, now going to the Tower, would subsequently arm what had previously been the opposition. In 1846 a decendant of the Oleys running The Spa Hotel in Shotley Bridge gave precisely this description to a local journalist: "…they were made to supply the implements of warfare to the belligerents: first to one party, and then another…" (see page 85).

It must have become obvious to all that the Shotley Bridge works was capable of producing far more than smallsword blades; see the next chapter for confirmation of this. It also meant that supplies to Jacobites would cease, causing Mohll to do some smuggling, as we shall see (page 47).

Telling the Tale

Everyone wanted this fashionable new smallsword, but not everyone could afford one: even Cotesworth's well-off friend in London felt aggrieved by the price of a "handsome sword". You could settle for a plain hilt, but there was still the cost of importing the blades and the restrictive tariffs. If someone was to bring a bunch of Germans bladesmiths into England with their secret machine, the country's cutlers could be supplied with reasonably priced blades and a fortune could be made… everybody knew that.

I will digress a moment because 'making a fortune' crops-up more than once. *Curious about this proposition, I did some simple mathematics to get an idea of just what was involved here… this was my conclusion:*

The adult male population at the time was roughly one million, and at the absolute most 1% of them could afford anything near £8.00 for a dress sword, so 10,000 were needed if everyone bought one at the same time. Assuming 10% bought one over a year, then making anything more than three blades a day would be sufficient to saturate the market and drive down the cost of the blades. They've got a secret machine that cuts down on labour time, so how many bladesmiths do you think were needed to satisfy the smallsword market? Their original plan was to bring twenty workers over. No one did the maths, this enterprise was about battlefield blades.

Of course they were very furtive these Germans, and if they were to bring their secret machine… well, somewhere secluded was mandatory. Equally, it must have all the other necessary facilities: adequate iron ore or bar iron supplies, coal, charcoal, water power, millstone grit, easy transport in and out, etc. John Bell, Hounslow's last remaining 'in house' German bladesmith, knew just such a place near the border with Scotland… would that be appropriate? Easy access to the Port of Tyne, yet neither in the County of Northumberland nor Durham, a no-man's-land. Would that do?

The principle cutler in Newcastle was Thomas Carnforth who had premises on The Side, which in 1685 was *the* place to be. He would buy his blades from various smiths, but getting German-made meant importing from Cologne via Rotterdam which was expensive and difficult due to quotas and duties and wars, or buying from London where there were still some German workers. Lastly, for many years, fine quality blades had come from Shotley Bridge, albeit in small quantities… therein begins the tale.

In 1670, a German named Wilhelm Berhtraban left Wira Bruk in Sweden to operate a forge upriver from Shotley Bridge; blades would subsequently be hilted in the village. His blades were also sold to Thomas Carnforth, who regularly worked with Newcastle goldsmith John Sandford on special commissions. They knew about John Bell, the last remaining German worked swordmill in Hounslow. More to the point, as his customers, Bell knew them… and all about Berhtraban with his forge in the Derwent Valley! Down in London were two money men, a goldsmith, name of Peter Justice, and a London brewer and future Lord Mayor and Sheriff of London, name of Sir John Parsons (knighted by King James in 1687), who was also the North of England Excise officer! Between them and Johannes Dell with King James' blessing they would import German swordsmiths from Solingen and set up a manufactory to – ostensibly – make smallsword blades at an attractive price. Newcastle goldsmith John Sandford was the fourth member of The Hollow Sword Blade Company.

John Bell (Johannes Dell) headed North in 1685 and took two German workers with him to get things ready. Peter Henekels and Heinrich Hoppie (Junior) had both been in Oxford with King Charles (1st) but had returned to London when the king fled the country. Hoppie doesn't appear to have remained in Shotley Bridge; Henekels stayed.

Berhtraban, or Bertram as he was known locally, was not only a bladesmith but, born and raised in Remscheid, the iron and steel center next to Solingen, he was also a producer of some very fine steel. While working in Wira Bruk he married into the Swedish Vinton family who, in 1660, had members running a lead refining works at Ryton on Tyne down at the foot of the Derwent valley. Now Vinton is a name that was a vital ingredient in this entire tale and without whom none of this three hundred year Derwent Valley history would have begun. Unfortunately, the importance of this family has been side-lined because it does not immediately appear to have any great significance. Also, the history of the Vinton family was not easily revealed… they were not British, nor were they German, so who were they, and how did they end up in the Derwent Valley long before anyone else? As far as Shotley Bridge swordmaking was concerned, and subsequently the early British steel industry – which would lead to the industrial revolution, they were the seeds from which it all grew.

Vinton and Bertram

Once again I asked "Why was there swordmaking in the Derwent Valley?" Back in Elizabethan times, when Daniel Hoechstetter was surveying the land looking for suitable minerals to mine (see addenda page 98), he became aware of the iron, coal and lead deposits around the upper Derwent – they had been mined since Roman times – so all he needed to do was develop the mining of the ores and set up smelters to refine them. Allensford is on record as having an iron-ore smelter in 1600, probably working lead too.

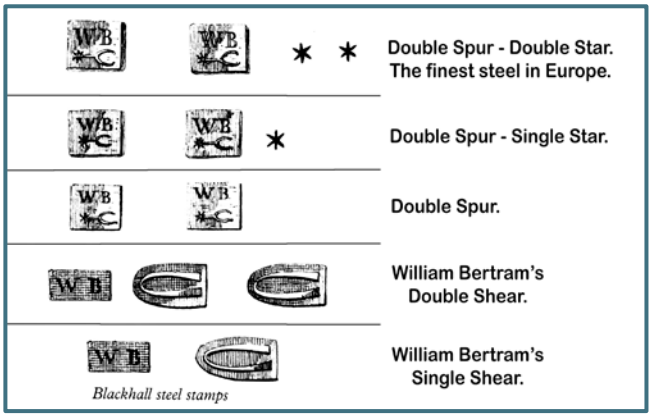
Some of Hoechstetter's 'Ingenious Artisans' were the Vintons from Sweden; they were in Cumbria at the end of the 1500s then we see them running a reverberatory-furnace lead-smelter in 'Ryton' in 1660; the Derwent Valley was part of Ryton parish up to Allensford and there were Vintons working at the Allensford forge from 1600 up until at least 1710.

So… the name Berhtraban was of old High German origin. Born in 1631, in 1654 Wilhelm Berhtraban left Remscheid – steel-making center in the Wupper Valley – for Wira Bruk in Sweden, a German worked sword manufactory established by King Gustav II in 1630. While Bertram was there he met his Swedish wife who we understand was the connection to the Vinton family and consequently, around 1670, he learned of the opportunity to go into business at Allensford. His wife, then a young mother, stayed behind with their son Johannes who also grew up in the metals trade and married Kirstin Israelsdr, the daughter of a Finnish goldsmith living in Stockholm. They had a son named Wilhelm after his grandfather – and there we have the cause of a great deal of confusion. Just as his father had done before him, Johannes left his wife and one year old son behind in 1693 and moved to the Derwent Valley to work with his father; although he nearly didn't make it when he was shipwrecked off the mouth of the Tyne and washed-up in South Shields. As business thrived (which it certainly did) all their family would eventually come and join them.

W. Bertram (1st) brought something called Double Spur-Double Star steel to Tyneside, and his monikers highlighted the improved quality over the existing standards of Shear and Double-Shear steel, marks of quality derived from the Yorkshire textile industry's standard for cloth cutting shears. The Bertrams were undisputed masters at producing high grade metals.

Producing ultra-hard steel was perfected in Nuremberg, but had been started in Prague in 1574. It was known as Cementation because of the system of cooking iron in clay boxes for several days. These clay boxes – or refractories – were made from specific clay and sand mixture bricks, an art in itself. The German company who developed the industry held a severe penalty over the head of any informed employee who divulged the secrets to outsiders. In return, however, they were lavishly salaried… such was the importance of the craft.

When Bertram worked at his forge in the Derwent Valley, nearly twenty years before the arrival of the Solingen families, he was labouring an art that was worth a king's ransom, but widespread news of his expertise didn't really come to light in the commercial world until 1691 when Ambrose Crowley arrived and took center-stage in iron and steel production (addenda page 115).



Blackhall steel stamps

Bertram would supply the swordmakers with steel until industrialist Dan (Den) Hayford from Roamley in Yorkshire (addenda page 113) moved in with a lot of investment capital and bought everything that wasn't protected by the syndicate. He put a ton of money into steel forges at Blackhall and Derwentcote, which the Bertrams and Vintons built and ran.

The longest enduring metalworking family in the valley (they were still there in the 1960s), some Vintons headed to the Saugus Iron Works at Lynn, Massachusetts (addenda page 136). Curiously, if you Google them now, you will find Vintons down in Essex recycling the lead from car batteries; obviously there's still metal in their blood.

Some of Bertram's family took their skills and secrets to Sir Ambrose Crowley, providing the means to significantly improve his steel quality. Some went to Sheffield; some went back to Solingen; in both those cases they remained active producing the very finest straight razors, the Sheffield branch receiving a royal warrant from Queen Victoria. It didn't end there: more about the Bertram's endurance can be found on page 86.

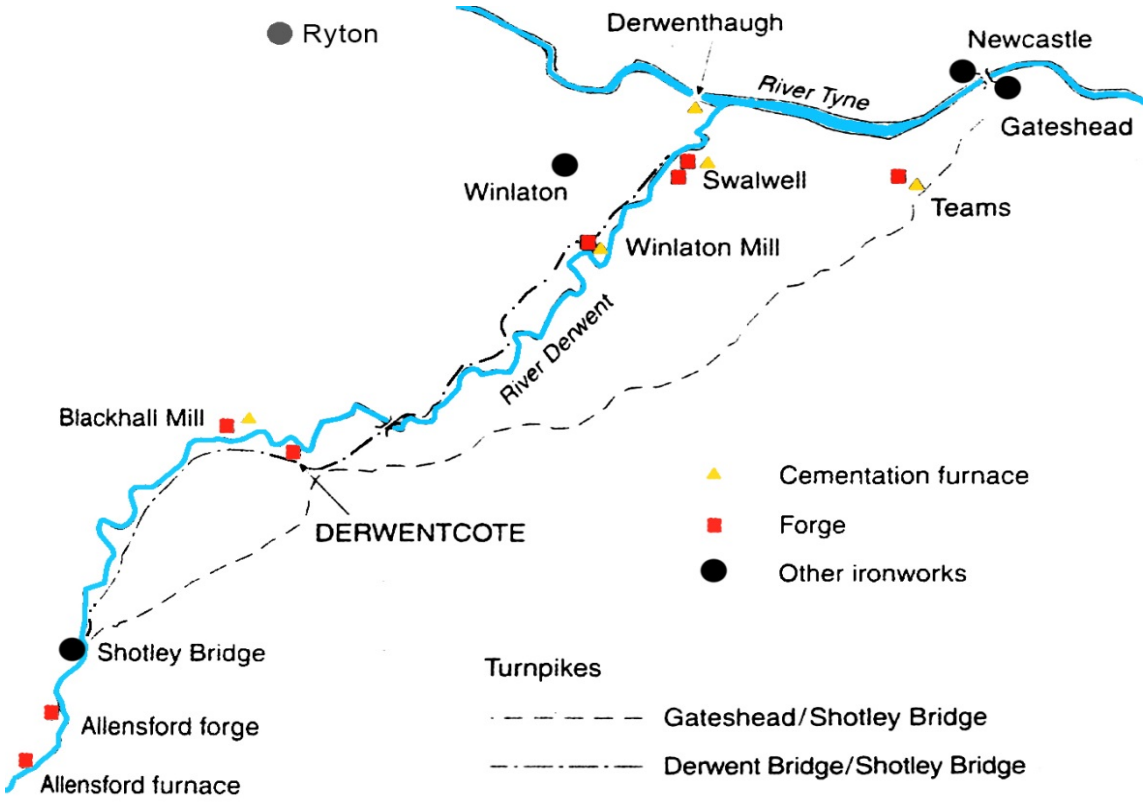
The Derwent Valley

Shotley Bridge spread south into the northern reaches of Consett as both towns grew; it sits astride the River Derwent which rises to the west of Blanchland in the North Pennines. For a long time the village was something of a no-man's-land as the river formed County Durham's border with Northumberland (*which, contrary to instinct, covers large areas south of the Tyne valley*).

Despite many chroniclers declaring the village virtually uninhabited and of no consequence prior to the arrival of the Germans, it was actually involved in agriculture, corn milling, forestry, coal-mining and metal-working.

As the bed of the river is often 'millstone grit', mills were a frequent feature of the valley and were in existence prior to the medieval period. The Boldon Book of 1183 documents, amongst other things, coal-mining and metal-working in the Derwent Vale. Back in 1624 when Sheffield became a recognised cutlery center, they were buying 'Newcastle Steel' which came from Allensford in the Derwent Valley (*at least until the port of Hull gave them access to Swedish imports many years later*).

This is a hand-drawn map from Douglas Vernon's book which indicates the industries in the early 1700s:



Jacobites

Being within spitting distance of the port of Tyne was of great importance, and we must equally consider all other attributes detailed by history writers down the years and indicated by me in the previous chapter. But, when it came to establishing the sword works in Shotley Bridge in 1685, we must take a far more vital factor into account, the fact that the lands of Sir Francis Radclyffe, a staunch Catholic and powerful Stuart supporter, literally bordered the village itself. I think, of everything we have been told over the past 300 years, this fact is now the glaringly obvious principle reason why Shotley Bridge was considered perfect.

Newcastle has always been opportunistic when it comes to rulers, as this example will admirably display: *In August 1688, the Mayor and Corporation sent congratulations to King James on the birth of his son: "…a blessing on the Prince of Wales". But in November of the same year, after the Glorious Revolution, that same Mayor and Corporation declared their allegiance to the Prince of Orange (William III) with a mob dragging the recently commissioned copper equestrian statue of King James, by Sir Christopher Wren, from its base on the Sandhill and tumbling it into the river. It was later retrieved and used for bells in All Saints and St Andrew's churches. An artist's impression (right):*

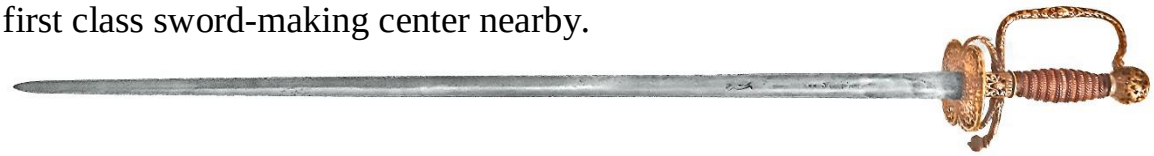
So, back to the need for an armoury up North: after the failed Monmouth Rebellion, Catholics and Jacobites were mustering… and arming. A German-worked sword manufactory up in the north was just what everyone needed – so long as it was disguised – and using a secret German machine to produce the prestigious hollow-blade smallsword was a perfectly plausible, in fact truthful, façade.

The north of England had long been viewed by those in the South as a den of Popery. "Half of the population is of the Popist faith and the other half are well-disposed towards it" wrote one Southerner. Actually, half of England's population were indifferent to religion back then, the remaining half were divided about 50/50: Catholic/Protestant.

Shotley Bridge, tucked away up the Derwent valley, and right alongside the lands of Sir Francis Radclyffe, 3rd Baronet and soon to be the Earl of Derwentwater (in the Lake District) following the marriage of his son to Lady Mary Tudor, daughter of King Charles II and actress Moll Davis; he was Catholic and a Stuart Royalist to the core.

More than anywhere else in the country, much of Northumberland, Durham, Cumberland and North Yorkshire remained loyal, if not also to the Catholic faith then certainly to the Stuart dynasty. Whichever way you look at it, Shotley Bridge was slap-bang in the middle of high placed, land owning, wealthy Jacobites and Catholic recusants.

North of Shotley Bridge, Dilston Castle was being replaced with Dilston Hall, the new seat of the Radclyffes whose estate bordered the north-west edge of the village. A few miles further north at Wallington we had Sir John Fenwick: a key Jacobite with a London house that was a den of conspiracy. At nearby Hesleyside Hall, Edward Charlton had established a center for Jacobite activity and a busy meeting-place for spies. Baron Widdrington was east-a-ways at Stella; plus the Haggerstons, Swinburns and Erringtons were all powerful local Jacobite landowners hereabouts. Also Thomas Forster of Bamburgh Castle and William Blackett (Mayor of Newcastle and High Sheriff of Northumberland) were firm royalists. When King James needed armed support, he could rely on the North, especially if there was a first class sword-making center nearby.



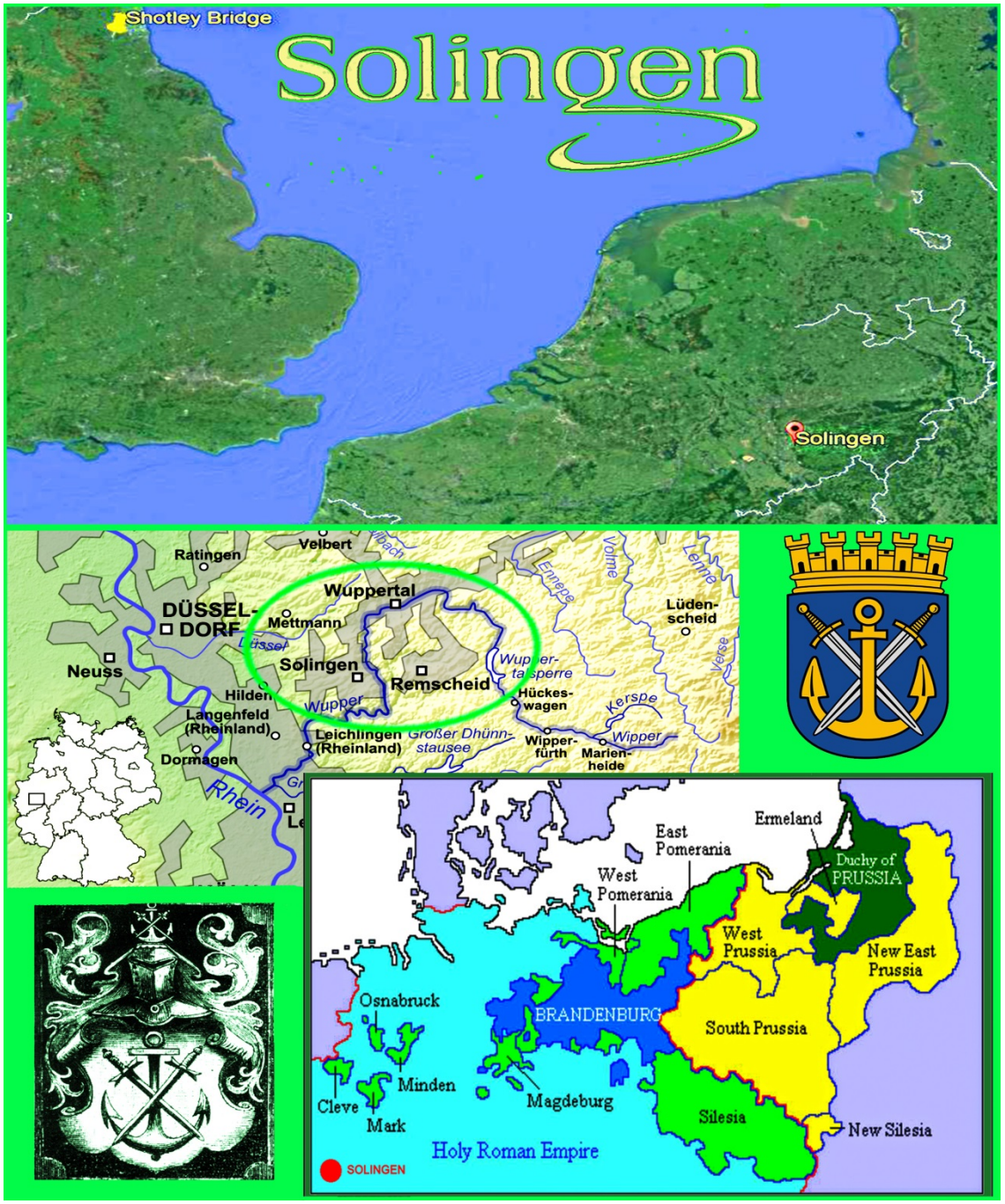
Above is a rare smallsword from Shotley Bridge with a well-appointed hilt; this was a handsome commission for Newcastle cutler Thomas Carnforth from George FitzRoy, illegitimate son of King Charles II, Duke of Northumberland and Commander of the 2nd Troop of Horse Guards, part of the King's army. *The Black Gate sword was also assigned to his troop (see page 92).*

In opposition, John Holles – when created Duke of Newcastle – supplied his troops with munitions-grade backswords bearing his seal (a boar) on the pommel and shell; they had Shotley and Bridg on either side of the blade.

Holles had been a firm royalist under Charles II, but he was also a passionate Protestant, so James' insistence on a Catholic country drove Holles to support Danby when he held York for William in '88. Those Holles blades (left: from Lord Gort's collection) were actually forged by Adam Oley in Shotley Bridge. These swords were supplied to non-commissioned troops who saw battlefield action, and consequently are far less common. I've only seen 2½ , all from Lord Gort's collection.

Germany

Despite centuries of misrepresentation, Solingen was *not* part of Prussia back then, it was the Holy Roman Empire, and remains Catholic. The inset map in the lower right corner below shows the pockets of acquisitions close to Solingen as Brandenburg-Prussia grew between 1600 and 1795: they are the islands of bright green ringed in blue. The Protestant parishes were predominently in Lennep, now absorbed by the city of Remscheid.



Initially, twenty workers (with or without their families) were called-for; Solingen agent Clemens Hoheman was recruited to head-hunt and arrange the departure. Adam Ohlig was a most important blade forger, or Klingenschmiede, from an extremely reputable ancestry that dated back to the 1400s. He was also a Lutheran minister. He was willing to go as principal forger and head of the exodus. This was not an unusual occurrence, as previously some of his ancestors had left for Spain (Toledo) and Sweden (Wira Bruk). He was also the mystery preacher mentioned by one chronicler and unknown to everyone else for decades.

Harmon and Abraham Mohll were *supposedly* second generation sword grinders – *but not guild members*, which is at variance with Solingen protocol. It later came to light that they were principals in the story of the infamous machines. Harmon was also a go-between, having permission to purchase and export unfinished blades from Solingen; he was instrumental in supplementing the output of Shotley Bridge which was never sufficient in times of need. Remember, the manufactory was established to produce civilian smallsword blades as cover for arming the Jacobites, not fulfilling huge demands from the Tower et al.; Sir Stephen Evance changed all that.

Now at this point I am going to list the names of those who actually arrived *and remained* in Shotley Bridge, which is at variance to the list of names cited by the Solingen authorities as having betrayed the oaths of their guilds, so: Harmon Mohll; Adam Ohlig; Adolph Kratz; Engel Schimmelbusch; Peter Tiergarden; Johannes Voes (x2); Johannes Wupper zu Feld; Heinrich Wupper; Arnt Wupper; Johannes Wupper zu Hesson;. To this list we can add Peter Henekels and Heinrich Hoppie, who had come up from Hounslow with Dell, and latecomer Oliffe Groats, but en poste by 1691. Clemens Schaffe also joined them, coming from Durham where he was cutlers guild warden. He was born in Solingen in 1624 and, while no confirmation date was found for his arrival, 1660 sees departures of persons unnamed from Solingen for Durham. By 1690 his 2nd son William Schaffe had joined him at Shotley Bridge. It has also been confirmed that Dell (John Bell) remained in the village; the Bell name was constant thereafter, and along with Oley, continues to this day. So, you will see that, including Adam Ohlig and Harmon Mohll*, sixteen German names settled and remained, not that it is especially important to the overall history.

*Abraham Mohll arrived, but left three years later.

The public indictment issued by the Solingen Guilds' authorities seems to be of great interest to everyone – in particular why it was twelve or more months after the exodus before it was issued, so here it is:

> We, Wilhelm Wassman, judge of the Court of Solingen, Mathias Wundes, Wilhelm Dinger, Wilhelm Vass Johann Ganssland, Peter Voess, and the entire court of jurors of the town and parish of Solingen, have become aware of the fact that about a year ago [1687] Clemens Hoheman enticed away several craftsman, who had long been established and connected with this area, to the kingdom of England, and furthermore incited several more to depart, and as the infamy has become well known and as this merits the severest punishment, Clemens Hoheman is accused of being a seducer, deserving the severest punishment along with all the other people involved.
>
> Through written summon's 'ad vallas' (in the valley) the cited persons, each and all of them were: …for the first, second, third and last time decisively called upon to employ themselves in the next six weeks and three days in this same place or produce firm reasons for your refusal and defection through yourselves in person or order sufficient powers of attorney. Warning- do these things or if you do not, that thereupon after the expiry of such appointed time, upon further appeals being calculatedly made to proceed against you, thereupon proceedings will be taken according to law.

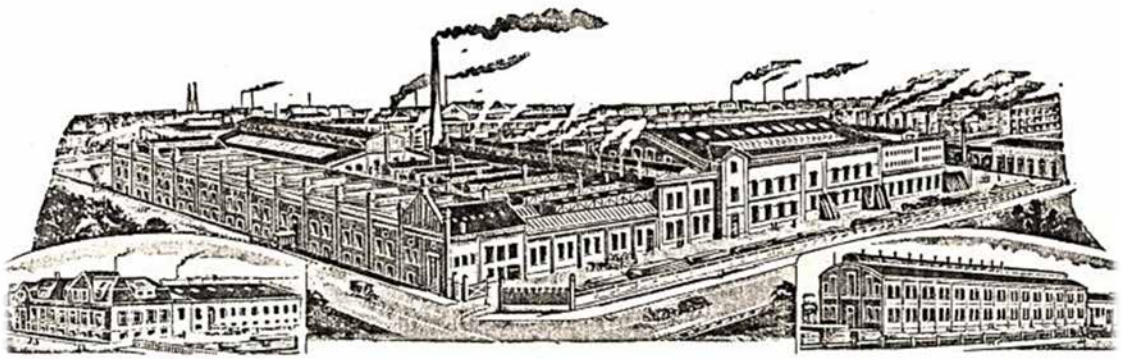
Under the impressions of the court and lay-assessor's seals, the order was drawn up under the date of 26th September 1688 by the clerk of the court - Johann von Marcken. Copies of these notices were apparently posted up on the doors of the dwellings of the swordmaker's relatives in Solingen. David Richardson has this to say about it:

"We know that these disappearances, or defections of swordmakers from Solingen were not uncommon, and coming forward in time to 1730 Solingen craftsmen defected to Strasbourg, and France's market was saturated by Klingenthal output for 200 years. In these cases the defectors names were read out from the pulpits. Their children - if left behind - were deprived of their rights and privileges. If the defectors were discovered in or around their homes they were to be 'punished on their bodies'(?) Craftsmen remaining were strongly reminded of their oaths in case they too were tempted to emigrate. All belongings would be forfeited and messengers were to be sent around the district warning that it would be an offence to help the defectors."

I have considered theories proposed by various chroniclers as to why there was a year's delay in the guilds publishing their indictments, but agree with John Bygate that it was simply because the families remained in situ, waiting until the accommodation in Shotley Bridge was established by the menfolk, who *could* have slipped out of Solingen unnoticed. Once all the families left, even in dribs and drabs, the workers were gone for good, so the guild masters were alerted and appropriately aggrieved, their authority much undermined. Richardson states: "by the time of the Klingenthal exodus they were threatening dire consequences". However, the arrival of thousands of Huguenots in the 1600s had saturated the work-force in the Wupper Valley. All of this aside, emigration of skilled smiths was not new, Bezdek gives a long list of locations and dates stretching from 1530 to 1840 – such as:

Madrid: 1530. Vienna: 1565. Toledo: 1587. Greenwich: 1603. Wira Bruk: 1625. Hounslow: 1629. Kranback: 1635. Amsterdam: 1641. Broby: 1648. Moscow: 1657. Durham: 1660.

This fluctuation of the work-force would continue all through the seventeen and eighteen hundreds with departures for Russia and the United States especially common. It has to be stressed that none of this would impact on future trade, and through to the mid. 20thc. Solingen was over-run with blade factories. Bezdek shows pictures, such as these three below, of over twenty such buildings. Top: Engels. Below: Christians left and Boker right.



The Hollow Sword Blade Company

The original syndicate of Bell, Sampford, Justice and Parsons submitted a request to King James for a patent giving them the exclusive right to supply hollow swordblades nationwide; this was the 'cover story'. Trouble was, at that time, the king was a bit busy, so while the request was put forward and accepted, it was never signed. Nevertheless, and needless to say, business was up-and-running, with all involved keen to see The Hollow Sword Blade Company publicly acknowledged.

Come the change of monarch in 1688, John Bell and Sir John Parsons leave the syndicate and new members arrive: Sir Francis Childs (previous jeweller to the Crown), Sir Stephen Evance (Governor; current jeweller to the Crown), Robert Peter Reneau (deputy governor and works overseer). Two others, Thomas Evans (Stephen Evance's brother) and Abraham Dashwood (Parsons's brother-in-law), also appear; Justice and Sandford remain.

So, King James has gone, William and Mary are on the throne, and one of the people who put them there was Evance when he helped finance the Glorious Revolution. So, the Hollow Sword Blade Company had a new hand on the hilt, and what *they* presented to the Crown was a request for a Royal Charter, and this time it was signed, sealed and delivered:

The request: *'They had been at very great charge and trouble in bringing from beyond the sea 19 or 20 families, in keeping them above these 2 years, building several mills and forges for* ***making hollow sword blades in ye north of England****. They pray for a charter of incorporation for the new mill during 14 years."*

The response. To:

The Governor and Company for making Hollow Sword Blades in England.

Our said subjects, at their great charge and management, have imported from foreign parts, divers persons who have exercised in their own country the said art of ***making hollow sword blades by the use of certain newly invented engines and mills and instruments*** *and by the contrivance of our said subjects have been prevailed upon to expose themselves even to the hazard of their lives to impart to our said subjects the knowledge of their art and mystery…..*

…..We have given and granted, And do hereby for Us, our heirs and successors give and grant, unto the said Governor and Company and their successors, agents, workmen, and servants the sole power, privilege, and authority of ***using and exercising the said instruments, engines, and mills for making hollow sword blades*** *within this our Kingdom of England and all our other Dominions.*

Seemingly, the Crown accepted that the new syndicate members were entirely responsible for the establishment of an enterprise whose sole purpose was to produce hollow sword blades using secret machines; however, the charter was only granted by Parliament on the condition that:

> *"to be chartered with separate legal identity and the power to raise a joint stock of any value, £50,000 must be advanced by the syndicate."*

From 1690 onwards, adverts were placed in London periodicals:

> "Whereas great industry hath been used for erecting a Manufactory for making sword blades at Newcastle by several able working men brought over from Germany which being now brought to perfection the undertakers thereof have thought fit to settle a warehouse at Mr. Isaac Hadley's at the Five Beds in New Street, where callers may be furnished with all sorts of Sword Blades at reasonable rates." (sic)

Within the articles attached to the company charter was a clause that permitted punishment and the seizure of goods from any person offering hollow blades for sale that did not have the company's mark. This mark has remained unknown as no English hilted hollow-blade smallsword from this period has any such marking; this may include the tang which is hidden by the hilt. To this end, in the spirit of bold exploration, I un-hilted my William Kinmen (London cutler) silver, boat-shell hilted colichemarde looking for a tang mark, but there was none (it *was* made much later: mid. 1700s).

This issue of exclusivity, and punishments threatened to smugglers (5shillings per dozen blades seized, along with confiscation), brings me to the conclusion that for some significant time thereafter most, or at least many, of our hollow blades came from Shotley Bridge.

In 1691, this Royal Charter was in the hands of high-flying businessmen at the top of the political and financial tree. It would eventually be used for other ventures – such as Land Banking when £20,000 worth of confiscated Irish Jacobite land was bought. Ultimately that was a not a good investment and, thinking himself penurious, Evance committed suicide; unnecessarily, as it turned out, having overlooked two big chunks of funds. The Charter was subsequently acquired by financiers who used it to establish the South Sea Company. You can find succinct essays starting on page 120 as this is way too big and complex a story to present here.

In 1703, a six year contract was signed by the principle German workers – except Mohll, who was constantly autonomous – and the secretary of the company Sir John Blunt (see page 52). That same year the company advertised again in the London Gazette:

> "The Hollow Sword Blade Company has lately received a considerable quantity of sword blades made at their mills at Shotley Bridge near Newcastle upon Tyne. They are now on sale at their warehouse in New St. near Fetter Lane."

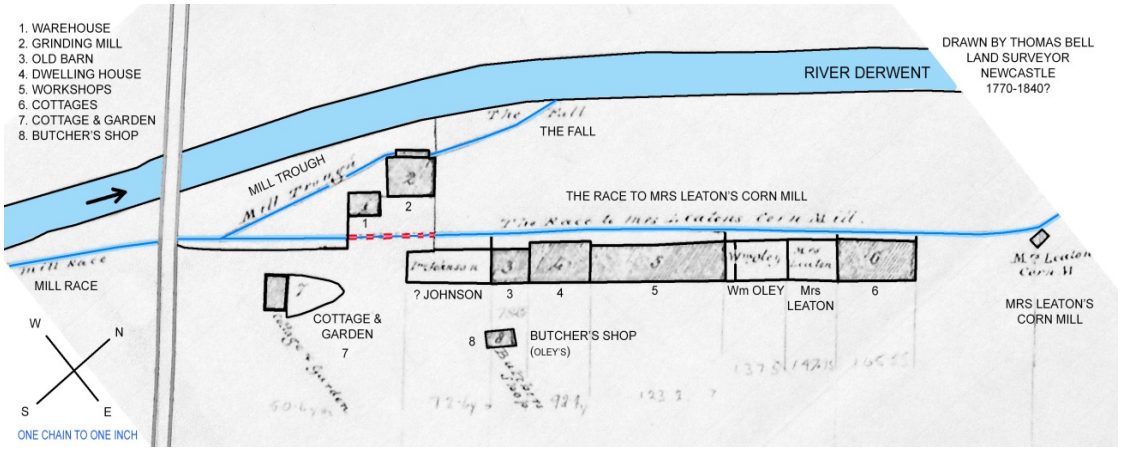
It was stated that the company had seen a 4% return on its investment in the Shotley Bridge works, but bigger plans were afoot, although rather than shut-up-shop it was decided to allow it to continue and, in 1704, at the suggestion of his friend (deputy governor) Robert Peter Reneau, Cotesworth bought into the Shotley Bridge complex as agent and manager. The recent contract between the bladesmiths and the Hollow Sword Blade Company remained, and they obviously kept their charter but renamed it The Sword Blade Bank, which produced its own banknotes embellished with swords.

In April 1710 after the six-year agreement ended, a three-year agreement was made between (by then owner) William Cotesworth and the German smiths. It was signed by Cotesworth and the 1703 signatories. This contract called for sword blades to be purchased from the Germans at *6 pence per-dozen lower* than the prices of the 1703 agreement. Between November 30, 1710 and August 21, 1712 Cotesworth purchased 1,600 dozen sword blades from the German smiths (19,200 blades in 557 days, or 34 a day). The cost was 935 pounds, 13 shillings which equals 1 shilling a blade. Most of the blades were sent to the Hollow Sword Blade Company warehouses in London; they in turn sent some blades back up to Glasgow for sale.

While this seems like a huge output, it had been necessary back in 1705, for Cotesworth to source additional swordblades from English smith John Scunthorp – but at a shilling a dozen cheaper i.e. 1 penny less per blade. Complaints rapidly rolled-in, and on at least two occasions chests of blades were considered unsatisfactory; the expression used to describe the quality of the blades was that they "…stand like lead". Shotley Bridge has sometimes been tarred with the same brush by certain chroniclers – but back then it was universally acknowledged that "Mr Oley of Newcastle produced the very finest blades available anywhere in the world".

Heritage

In order to convey a degree of understanding of the village back then I have restored this hand-drawn map from the end of the 18th c.



This is the best that I could achieve: I have enhanced the original image which was faint in places and I've included a reference index at top left.

You can see that the river – flowing south-west to north-east – has been channelled into a mill-race which splits in two, one part running along the back of the buildings on Wood Street, but the other part, called the Mill Trough, powers the main water wheel in building 2 which, until 1724, belonged to Mohll. Because the map was compiled somewhere towards the end of the 1700s we must accept that some changes in ownership have taken place since the Germans first arrived and built the place. An example is *Mrs Leaton's Corn Mill*: Leaton-Blenkinsop is a name associated with blade-making at Shotley Bridge; a Leaton was present in the early 1700s alongside a Johnson; it appears both of these local land-owning families had indentured sons to the Germans… grinding and finishing, never forging!

Swedish industrial spy Kalmeter visiting in 1719 observed twelve craftsmen, each with his own workshop; potential output was 21,000 blades per annum. RR Angerstein – another Swedish spy – observed eight workers in 1754.

From 1691, Adam Oley (1st gen') used 44 Wood Street as a church, guildhall, and schoolroom – hence the lintel inscription (page 39). He used the buildings on either side as his workshops. A full list of the final Oley estate can be seen in the 1810 will of William Oley, the grandson of the original immigrant. The new Methodist Chapel, built in 1814 by Christopher Oley (4th gen') while spending his inheritance, can be seen bottom-left on page 38 and was the only late addition.


Back of Wood Street c.1900


The Oley residence and guild hall, plus the school-room


Wood Street 1950s


Wood Street 2020


The Methodist Chapel in 1953


Wood Street just prior to demolition in the 1960s

The Germans were all Lutherans; Adam Oligh was a Lutheran minister from an ancestry of such. Inscribed lintels were observed above two doors to houses on Wood Street; 1820 seems to be the first record of these, and one of them was badly decomposed even then. Council records state that the better of the two (#44) was removed prior to the demolition of the street and supposedly taken to a place of safekeeping in Consett. Unfortunately, its whereabouts is now unknown, despite some diligent and authoritative searches being undertaken recently. According to a recent statement from a workman involved in the demolition of Wood Street, the #44 lintel fell and split in two; supposedly, both pieces were pushed into the river (possibly).

I am very grateful to John Bygate who has this to say about the text:

DES HERREN SEGEN MACHET
REICH OHN ALLE SORG WAN
DV ZVGLEICH IN DEINEM
STAMD TREV VND FLEISIG
BIST VND DVEST WAS DIR BEFOHLEN IST

"This is actually a piece of verse and *should* have been laid out in lines like this, (and here I have written it in more modem and *correct* German):"

DES HERREN SEGEN MACHET REICH
OHN ALLE SORG WANN DU ZUGLEICH
IN DEINEM STAND TREU UND FLEISSIG BIST
UND TUST WAS DIR BEFOHLEN IST

"This at least can be translated without difficulty or speculation, and in English it says:"

THE BLESSINGS OF THE LORD MAKE YOU RICH
WITHOUT ALL THE TROUBLES
IF YOU ARE BOTH DILIGENT AND FAITHFUL IN YOUR WORK
AND DO AS YOU ARE COMMANDED.

The second lintel's inscription again benefits from Mr Bygate's efforts:

DEUTSCHLAND IST UNEVER VATTERLANDS	**GERMANY IS OUR FATHERLAND**
SOLINGEN IST DIE STADT VERLASSEN	**SOLINGEN IS THE TOWN FORSAKEN**
HERR BEHUT DEINEN AUSGANG	**LORD PROTECT YOUR ENTRY**
UND EINGANG	**AND EXIT**

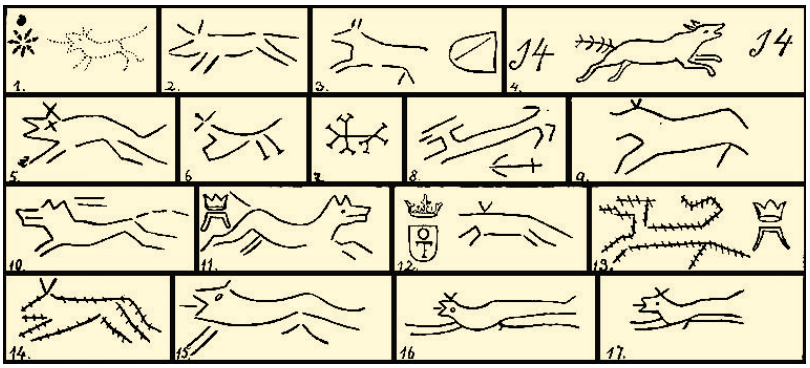
"The last line is taken from Psalm 121, verse 8:"

"The Lord shall preserve thy going out and thy coming in from this time forth and even for evermore."

Blades

Lengthy periods of time are still completely lost to even the best equipped historian, and the initial few years are no exception; however, what has been established is that the Germans arrived from Solingen with a load of unfinished blades, enough to get the business under-way. These blades were stamped with the Running Wolf, a mark first used by Bavarian smiths to indicate provenance and quality. Although originally exclusive to the town of Passau, it was adopted by Solingen who often supplied Passau with stock blades when needed. While sometimes retaining its moniker of Passau Wolf, it was more commonly known as the Running Wolf and attributed to Solingen. Over the ages a multitude of alternative styles appeared, with some amounting to no more than a few lines and others showing a more stylised art. It was also not uncommon to hear it described as a fox, and therein lies the start of a contentious issue that I shall explore later.

Below: Passau/Running Wolves (not foxes!).



In order to advertise the new sword-works the smiths stamped SHOTLE(Y) and BRIDG(E) on those imports, so many folk have considered the Passau Wolf as being from Shotley Bridge – but it is not; the only reason blades with the inscribed name also have the Wolf is because they are part of that initial batch brought over from Solingen in c.1687. There were not many, and they only added the lettering because the syndicate needed to announce the presence of their investment; a blade with just a Wolf meant they came from Solingen i.e. imported and possibly smuggled. Once that initial supply ran out, and blades were being produced at the village forge, there were – apparently – no more marks used, although they continued to add SHOTLEY on one side and BRIDGE on the other. The issue of animal markings is explored in further detail on page 65.

The following montage (not to scale) shows the various hilts used on swords with the Passau Wolf and script markings on their blades. All of the blades are of a similar form i.e. broadswords: having both edges sharpened.

These are the hilt styles that I have found to date; I have seen twelve of the Horseman's swords (far left). Top center is a 1640s Hounslow-style carved ivory hilt; below that, bottom-center-right, is a 'Hangar' with a shortened blade used in boar hunting. Far right is a civil-war 'Mortuary' hilt. What looks like a dagger is a 'plug' bayonet which was *plugged* into the end of a musket barrel after the shot was fired. Final note: the anachronistic presence of civil-war period hilts on 1688 blades is not totally unusual as they were almost certainly treasured heirlooms needing fine replacement blades.

Industrial Revolutions

Well, it has taken a lot of research, because one thing can always be said of the German bladesmiths: they were a very secretive bunch – quite naturally; and despite promises, as early as Henry VIII, to educate the English in their trade, it didn't happen until the 18th c. because each stage of manufacture was achieved by an expert in purely one procedure. So even having an English son indentured, as happened in the village, did not mean they became capable of production from beginning to end, only of one aspect.

So, machines! All can now be revealed. The first innovation came about when super-hard steel materialised in Nuremberg in 1601, created using a process known as 'Cementation'. It resulted in what we now know as 'tool steel' i.e. extremely hard and, in this instance, it had one important purpose: it could be used to profile small, very hard, dry-grinding wheels; this was something that had not been possible before. This is what that machine at Shotley Bridge looked like:

Drawn (from sight) by Swedish metallurgist RR Angerstein in 1754.

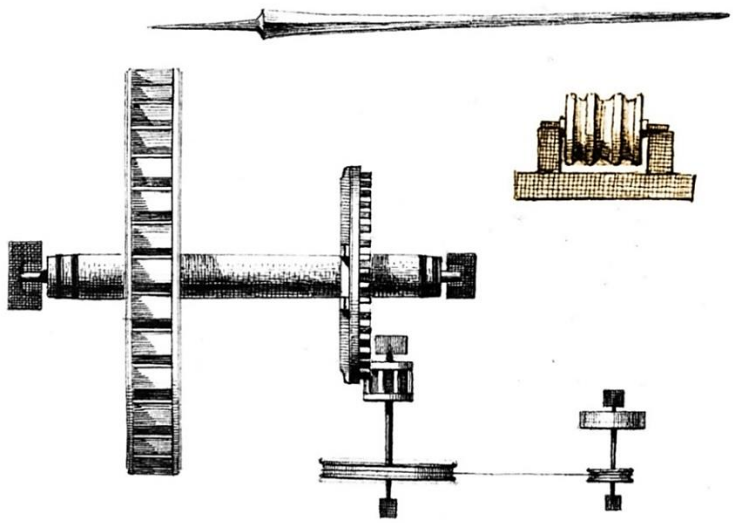


Fig. 256 Sword blade, grinding train and grinding stone

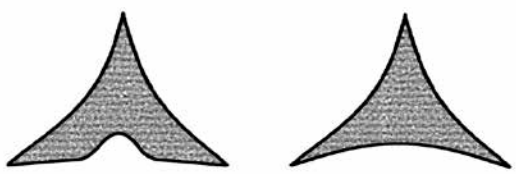
The narrow grinding wheels allowed the hollows on the blades to be dry-ground in a fraction of the time it had taken to hand file them. I was overjoyed to find this diagram, because it is one of the most important elements of this history, and I feel it casts in stone what has been a very contentious issue. Angerstein was a satisfyingly precise illustrator, observing, first-hand, the smallsword production in full flow; but only in the grinding house – never the forge where the second machine lived… to this day unobserved as far as I am aware.

Early on in my research – and I should explain that when I began this endeavour I was an absolute ignoramus regarding swords – I noticed that there was another style of smallsword known as a Colichemarde, although actually, nobody knows for certain why it is called that (theories abound). This alternative blade shape was generally attributed to officer-class battlefield activity as opposed to dress swords, in other words, used for occasional fighting. See the next page for examples.

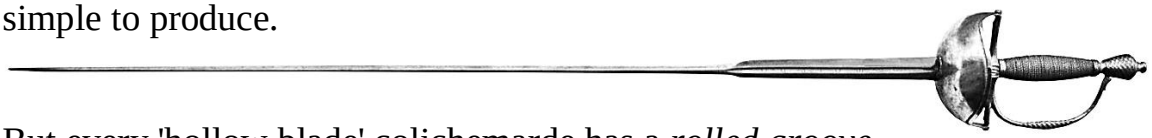
On all swords the section of the blade at the top is known as the forte (pronounced fort), but in this instance it is especially appropriate. Although, like the sword's name, the purpose behind this odd shape is not absolutely established, it is generally considered to be for more effective use against heavier battlefield swords, allowing blows to be parried without significant damage being done to the slender blade of the more common smallsword; this is a much disputed theory but there has never been a better one.

The Colichemarde accounts for less than one percent of all smallswords in museums today, which suggests two things to me: first, officers frequently engaging in active combat used the best tool for the job which was not the Colichemarde; secondly, it was not considered pleasing to the eye – especially sheathed – compared with the shape of a regular smallsword, so was rarely adopted by civilian fashionisti. Nonetheless, in 1767, George Washington was presented with one and valued it highly.

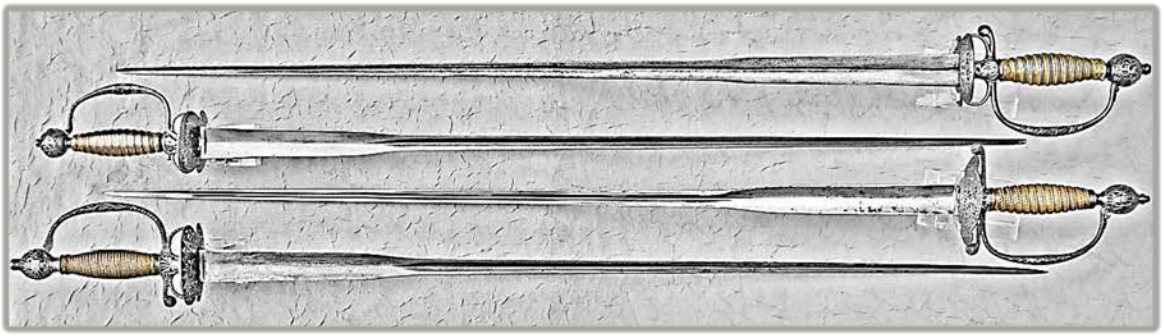
Now there is a reason why I have devoted this attention to the Colichemarde, and it has to do with that infamous yet mysterious second machine: a 'one pass' machine. The Huguenots had developed a machine for the Solingen industry that used a profiled wheel pressing down on the red-hot triangular stock and forcing it into the same sort of anvil die as had been used for centuries, so creating a groove above and two tapering hollows below. Therein lies the rub: using a profiled roller-wheel to produce a groove of constant width was well within the capabilities of the Huguenots, *but* the traditional smallsword hollows had a gradually reducing radius that resulted in a very pleasing symmetry of curvature to the blade and was consequently first choice for most fashionisti. The groove was easy to achieve, but didn't look as good as the regular trefoil blade.



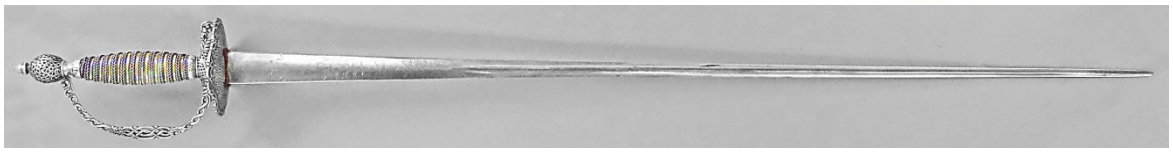
The broad forte style seen on this transitional rapier existed before the arrival of the hollow blade and for some time after as it was relatively simple to produce.



But every 'hollow blade' colichemarde has a *rolled groove*.
Here are four from the collection of my friend (thanks Mel). Note the groove in the top blade runs all the way to the hilt which is unusual.

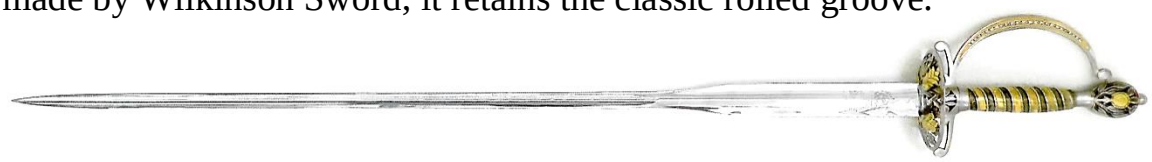


The swords below are not actually colichemardes as they don't have a shoulder; top is for a youngster and has a small hilt and a shortened blade.



Below, is a unique smallsword from Birmingham producer Thomas Gill. It was made during the reign of George III for a naval officer, hence the short blade which was preferred when working and fighting within the confined of a ship. This shows the rolling machine in operation in the late 1700s.

Finally, in 1977, to celebrate the silver jubilee of Queen Elizabeth 2nd this luxurious colichemarde, with a gold and silver, diamond encrusted hilt, was made by Wilkinson Sword; it retains the classic rolled groove.



The Ambrose Crowley slitting mill at Winlaton in the Derwent Valley. Taken from a video recreation of the mill in action that can be seen at The Land of Oak and Iron https://www.youtube.com/watch?v=F_UPuImxut0

A nail-maker in Stourbridge called 'Fiddler Foley' featured in a story told years later by his descendant Samuel Lloyd – of Lloyd's banking fame. Foley went over to Sweden to find out why they could drastically undercut him on the price of nails. He arrived there penniless, so took to busking on the violin to earn his keep. Much taken by his music and performance he was indulged freedom and opportunity enough to spy on their nail making plant and discover their 'slitting mill'. The Swedes did not invent it, the Huguenot diaspora out of Liège designed and built it.

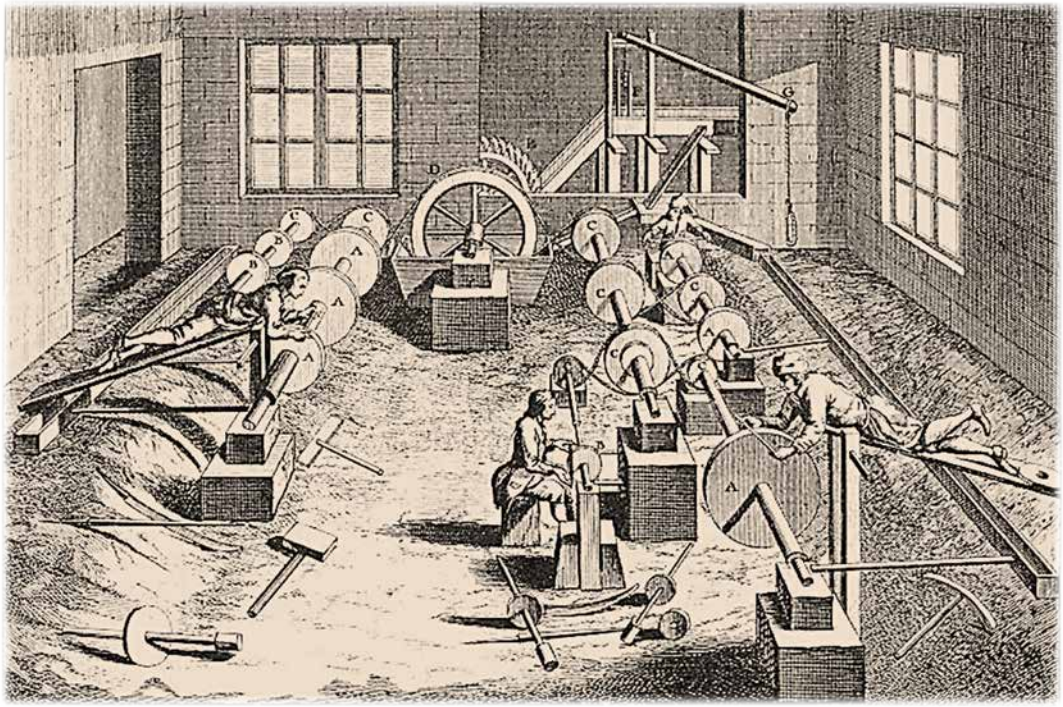
Ambrose Crowley had a slitting mill at Winlaton Mill in the Derwent Valley. He came from Stourbridge, and is an important figure in this history – as we shall learn. Originally, in 1683, he employed Huguenots at his new factory on Sunderland's riverside where he made nails for the ship-building industry until, first, local discontent from Catholic workers, then discovering the advantages of the Derwent Valley, plus some help from local landowner Sir William Bowes, convinced him to move to Winlaton in 1691. He would subsequently expand into the huge works at Swalwell a little later. Sir Ambrose Crowley has not so much been written out of history as overshadowed by Consett Steel Works, Lord Armstrong et al. Plus, nothing was left of Crowley's vast metalworking complex by the time anyone took notice.

At the beginning of the 1700s Crowley's manufactory was the biggest industrial complex in Europe – probably the world – and according to his advertising could produce anything from a needle to an anchor. The Government eventually owed him so much money they could not pay him back (over fifty-thousand pounds for Naval supplies alone (think slave trade)) so they made him deputy-governor of the South Sea Company and converted his debt into shares – oops!

But before Crowley arrived in the valley, the Germans were already enjoying the advantages of their own superior steel technology courtesy of Bertram, and their own machine revolution courtesy of the Mohll family.

There were two machines – or engines, as they were often called. The grinding-wheel system visibly made it to Shotley Bridge because that was where Angerstein saw it and sketched it in 1754 (p.42).

At that time, according to Angerstein, the Oleys were concentrating on forging hollow-blades for smallswords, employing John Wilson to acid etch or engrave the embellishments; ten years later, Thomas Bewick would take over decoration for a short spell, courtesy of the Beilbys. What Angerstein didn't get to see was the second machine in Oley's foundry; no-one got in there! The second machine was the single-pass rolling machine that put the grooves into hollow-blade smallswords, but more especially, into colichemardes. Below: a typical grinding mill – minus the small wheels!



Smuggler Mohll

The curious business of Mohll's arrest for treason and smuggling follows:
All public correspondence between the local authority Henry Villiers JP; Sir William Blackett, Sheriff of Northumberland; and Daniel Finch, Earl of Nottingham/Secretary of State concerning this affair, is well preserved in county and country archives. Below are some of the first missives transcribed from the original scripts:

(To Nottingham) January 2nd 1703/4

Whereas upon an information this afternoon laid before me, Henry Villiers esq one of her majesty's justices of the peace for ye county, by Henry Slade, Richard Gilman, John Petty and Jeremiah Roper, tide waiters belonging to ye Customs House at North Shields they had in their watch house several bundles of sword blades and hanger blades which they had seized in ye house of Thomas Davison of North Shields waterman, upon which I immediately went to ye said watch-house and had ye sword blades delivered into my custody by ye officers above mentioned. Then I immediately sent for your constables to bring ye said watermen before me who upon examination owned that they were Jeremiah Burns and William Foster of James Place did bring them from on board ye St Anne of Rotterdam. Cont…

(From Nottingham): Whitehall Jan 8th 1703/4

Your letter of 3rd was laid before the committee, by their directions I am to tell you that ye Armes who came on ye ship from Rotterdam must remain in your custody until further orders and that you must endeavour to seize and secure the master of that vessel and also those Scotch and Irish soldiers which were on board her; and take care that Davison be further examination concerning this matter from…
Your most humble servant Nottingham

(To Blackett) January 12th 1703/4

Whereas Hermon Mohll ye Dutchman was brought before me one of Her Maj's Justices of the Peace ye County upon an information of this instant made by Henry Slade, Richard Gilman, John Patty and Jeremiah Roper tide waiters bringing to ye customs house North Shields they had in their watch house several bundles of sword blades -

- and hangar blades which belonged to ye said Herman Mohll who upon examination upon oath declared that they were made in Solingen in High Germany that he brought them hither in order to carry them to Shotley Bridge and to dispose of them there and this defendant further make the oath that one Mr Peter Reneau was his correspondent there.

Having taken ye information upon oath, of Henry Slade, Richard Gilman, John Petty and Jeremiah Rooper tide waiters, I have bounde over to prosecute Henry Mohll for sworde blades which he brought over to sell as will appear by his owne affidavit; which Henry Mohll is delivered up unto ye Galer of Morpeth in order to be examined at ye sessions. I have also bounde over Thomas Davison of North Sheilds in whose house ye said sword blades were found; who upon examination owned that he with Jeremiah Burn & Wm Foster did bring them from ye St Anne of Rotterdam. To answer unto ye sessions what shall be alledged against them who did make their complaint to me that they thought they had hardship done him by Mr Shelly surveyer of customs in his seazing their boat and carrying her to Newcastle by which means they are deprived of their livelywhood. I told him that I did think their best way would be to apply to ye sessions which I suppose they have done so upon my inquiery of their neighbours. I also find they have a good reputation although I have bound over for custom house officers to prosecute yet I told them that if her majesty's service required their attendance here that one of them would be sufficient to prosecute.

I have since that seizure of those sword blades had brought to me about thirty more sword blades of another make being hollow blades and taken up by ye fishermen of South Shields near ye salt pans as they were getting of bate which I believe this Harmon Mohll may know something of if he strictly examined and I also find by ye Earl of Nottingham's letter that it is ye order of ye commity of her majesty's council that a strict examination be made about ye sword blades and I have here enclosed a copy of ye said letter for you to keep and also ye original to peruse which I would desire you to return again by your leave unto ye humble servant Henry Villiers.

In 1704, on the 2nd of January at 2am, the Dutch ship St. Anne (?) out of Rotterdam entered into the Tyne. A wherry (local cargo boat) was passing alongside and hailed from on-board the St Anne. The watermen on the wherry were asked to take bundles of cargo to a place of safety and keep them overnight until someone would arrive and accompany the bundles upstream to Gateshead. That was the official story the watermen told as all this had been observed by Tide Waiters (customs officers) who had seized the boat and the wherry crew and had also seized the cargo from a house in North Shields (north of the river) belonging to waterman Thomas Davison.

The St Anne had subsequently moved to its assigned docking at Hebburn (south side of the river and some distance upstream) where the passengers, who were Scottish and Irish soldiers, along with the ship's captain, were placed under arrest. A Jacobite conspiracy was suspected.

The following day customs officers went to the Davison house where they waited for and arrested Herman Mohll who declared, on arrival, that the 48 bundles of sword-blades were his and he had brought them from Germany to sell. As he could not provide sureties (bail) at that point, he was imprisoned in Morpeth jail, as treason was what was suspected due to the presence of the soldiers who would turn out to be perfectly innocent and not Jacobite militia at all. That same day, a bundle of 32 'hollow' blades was found in the mud at South Shields and until recently remained a mystery.

Late in January, after the Sheriff of Northumberland had become involved, and the Secretary of State Earl of Nottingham had been consulted, two witnesses were brought to testify as to Mohll's probity. One of them was the Newcastle cutler Thomas Carnforth, who declared his intention was to buy a quantity of the blades for his business; the other was Heinrich Wupper, one of the Solingen workers in Shotley Bridge, who testified as to Mohll's good character. Then Robert Peter Reneau, second in rank in the Company and link between the village enterprise and the syndicate, paid some fines and Mohll was set free. Smuggling perhaps, treason… no.

Far, far more able and experienced eyes than mine have, over the decades, deciphered all the above from the archive material here and at Kew. So all the names of the various participants in this affair are well documented, but of absolutely no consequence except for two. First, that of Sir William Blackett who we know was very definitely a Jacobite; if there was a treasonous aspect to this affair, he will have made it disappear.

Secondly, Blackett got all of this done with the help of Nottingham, and we don't have to wonder how. Daniel Finch, married to Queen Anne's Lady of the Bedchamber was, on the surface, absolutely no Jacobite – until you look into his earlier history. In 1685 he was one of the signatories to the order for the proclamation of James, Duke of York as king; he declined to join the invitation to William and Mary; he had been in favour of James as king and William as regent. (NB: Queen Anne herself was a Jacobite and declared that James (III) the Old Pretender should inherit the throne on her demise.)

However, what you have to marvel at is that anyone would swallow the story told by the watermen: that they were complete strangers simply passing-by at 2am and given nearly fifty bundles of extremely valuable sword-blades to take into their care! No, not a chance, they were there by pre-arrangement, but obviously could not admit to that. Then, that Davison, an apparent unknown, was arbitrarily chosen and accepted by Mohll as caretaker of these sword-blades? Not in a million years. Again, it was all pre-arranged. Before docking upstream at Hepburn the sword-blades would normally be transferred to Davison, who was obviously Mohll's point of contact. Equally obviously, had all gone to plan, the blades would have gone where? Almost certainly to local Jacobite militia. (Question: who was doing all the hilting?) Company man Reneau had paid Mohll's fines for – *maybe* – attempted smuggling and, while company Governor Evance was definitely a firm Williamite, Reneau's politics and religion remain unknown.

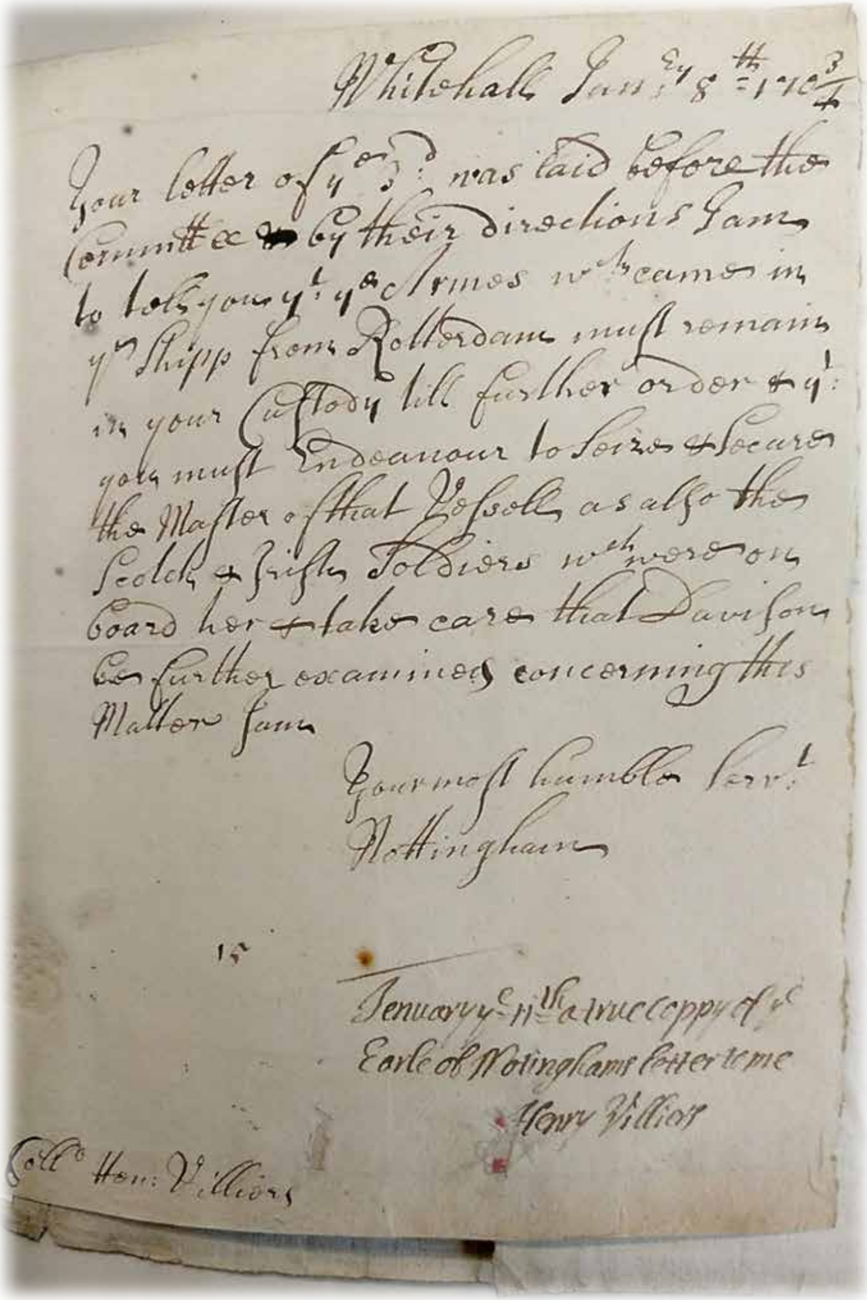
The 32 blades, *probably* fallen overboard during the changeover to the wherry, were obviously going surreptitiously to Carnforth, who did publicly declare he was waiting to buy blades from Mohll. However, Carnforth had declared under oath that he intended to buy twenty-dozen blades from Mohll – no mention of 32 hollow blades. Exactly what a Newcastle cutler would be doing with 240 *battlefield* blades is another question altogether: another question never asked, along with why Mohll and his family were not on the ship when the captain and soldiers were arrested? Where had *they* gone? The entire story was obviously being stage-managed by Blackett.

The sword blades were subsequently commandeered by the Queen* and nothing more was ever heard of the affair. Perhaps only this: two years later, Villiers, local JP himself, was arrested and charged with smuggling.*

*Thank-you Helen Steadman for these two final facts; her novel *The Running Wolf* (Impress Books) is based around this affair.

One additional piece of information came to light regarding this smuggling business: the control of 'Customs' at ports was 'farmed-out' to appropriate individuals (based on what qualifications?), so we may have had a conflict of loyalties here, or we may have had tide-waiters acting in all good faith until subsequently disabused by the man in charge. Remember, John Parsons, the most powerful member of the 1st syndicate, had been Excise Officer for the North of England! Herman Mohll was probably smuggling blades into North Shields long before he was caught, and long after too.

Here's a letter to Villiers from Nottingham.



Whitehall Jan:ry 8th 1703/4

Your letter of ye 3d: was laid before the Committee & by their directions I am to tell you yt ye Armes wch came in ye Shipp from Rotterdam must remain in your Custody till further order & yt you must Endeavour to Seize & secure the Master of that Vessell as also the Scotch & Irish Soldiers wch were on board her & take care that Davison be further examined concerning this Matter I am

Your most humble Servt

Nottingham

15

Jenuary ye 11th a true coppy of ye Earle of Nottinghams letter to me

Henry Villiers

Coll. Hen: Villiers

The 1703 contract

This is an acurate transcript of the 1703 contract; what follows are lists of assets associated with the Shotley Bridge works, and of all the styles of swordblades to be made; those transcriptions are of unknown provenance:

Articles of agreement indented and made concluded and agreed upon this Twenty Seventh day of April in the year of Our Lord One Thousand Seven Hundred and Three between Henry Wooper; John Wooper; Peter Tiegarden; Adam Olligh and Wm. Schafe; swordblade makers residing at Shotley Bridge in the County of Durham of the one part and the Governor and Company for making Hollow Sword Blades in England of the other part. Impris they the said Henry Wooper, J.W., P.T., A.O. & W.S. for themselves severally and respectively and not jointly or one for another or for one anothers' acts do covenant promise and agree by these presents to and with the said Governor and Company and their successors and assigns in manner and form following (that is to say) that they the said Henry W., J.W., P.T., A.O. & W.S. and every of them severally shall and will for and during the term of 6 six years to be reckoned and accounted from the date hereof will truly honestly constantly faithfully and diligently to the utmost of their power skill and ability serve them the said Governor and Company their successors and assigns in the art occupation and employment of working, making and finishing of swordblades to and for the only proper use and benefit of the said Governor and Company their successors and assigns at Shotley Bridge or such other place as the said Governor and Company shall appoint in the County of Durham at and for such rates and prizes as on the back of these presents are for the purpose mentioned and expressed and that they the said parties herein named of the first part shall and will during the said term of six years upon demand deliver up unto them the said Governor and Company their successors, servants or assigns at Newcastle in the County of Northumberland and to no other person or persons whatsoever all such merchantable good and sufficient swordblades as shall from time to time be wrought made and finished by them or any of them and that all the said sword blades shall from time to time be wrought made and finished in all respects at the sole and proper costs and charges of them the said H.W., J.W., P.T., A.O. &. W.S. and shall be of such proportion of size as on the back of these presents is for that purpose mentioned or of such other proportion or size as the said Governor and Company their successors agents or assigns shall from time to time order and direct. They the said Governor and Company or their assigns paying for such other sizes of sword blades as are not on the back hereof mentioned proportionably. cont.

And further that they the said H.W., J.W., P.T., A.O. & W.S shall from time to time during the said term of six years preserve maintain and keep all and every tools and engines utensils and other instruments used and employed in and about the making and finishing of the said sword blades which are within the shops and mills together with the wheels of the watermill and mills and frames thereunto belonging to be used for or relating to the making of the said sword blades in good and useful sort and condition of repair and at the determination of the said term shall yield and deliver up unto the said Governor and Company their successors or assigns all the said tools, engines, utensils and instruments particularly mentioned and expressed on the back of these presents in as good order and condition of repair as the same are at the sealing of these presents.

And moreover that they the said H.W., J.W., P.T., A.O. & W.S or any of them shall not nor will during the said term of • • • • • . • • • • • • • • for ••••••• proper use and benefit nor for the use or benefit of or sell or •••• of any sword blades to any other person or persons whatsoever save only the said Governor and Company their successors or assigns upon the penalty of forfeiting losing and paying up to the said Governor and Company and their successors by every person or persons so working selling or disposing the sum of one hundred pounds lawful money of England and they the said Governor and Company for themselves and their successors do covenant promise and agree to and with the said H.W, J.W., P.T., A.O. & W.S. that the said Governor and Company their successors and assigns shall from time to time receive take and pay for all good and merchantable sword blades being of the workmanship of the said H.W, J.W., P.T., A.O. & W.S. at the time of delivering of the same to them or their assigns according to the rates and prizes on the back of these presents for that purpose mentioned and all that the said H.W, J.W., P.T., A.O. & W.S. shall have the use of the Hammer Mill for the making of sword blades at such days and times as shall be necessary during the said term for forging such sword blades as they shall make as aforesaid for the said Governor and Company. In witness thereof to one part of these present remaining with the said H.W, J.W., P.T., A.O. & W.S. the said Governor and Company have caused their common seal to be affixed the day and year first above written.

By order of the Court of Assistants

Jno. Blunt

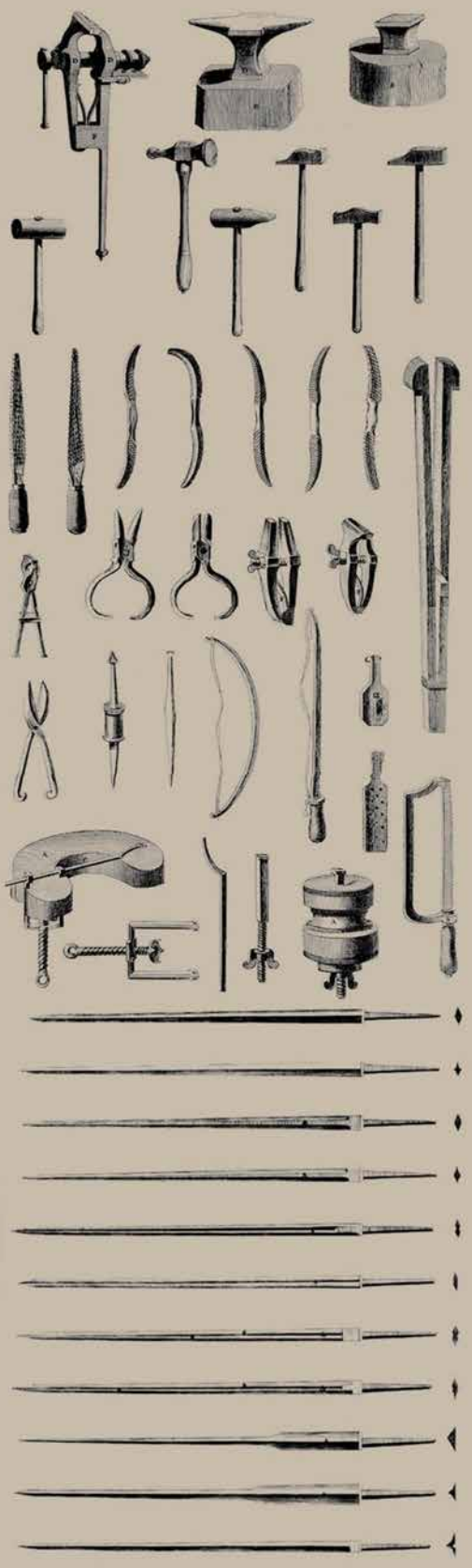
Secretary

A precis follows:

Essentially, they must only work for the syndicate or its agents, make any of the blades listed, at the quoted price, and must take good care of the workshops and tools. A list of blade specifications with prices follows, then a list of tools. The illustrations of tools and blades are my addition, courtesy of Diderot's encyclopaedia. It is patently obvious they were making a lot more than smallsword blades for gentry.

		Length	Width	Prize per Dozen
o. 1	Small 3 Square blades inches	30 to 33	to $\frac{6}{8}$	0 11 6
2	Small Ditto	34 to 37	to $\frac{6}{8}$	12 6
3	Small Ditto	31 to 34	to 1	12 6
4	Small Ditto	35 to 37	$\frac{7}{8}$ to 1	13 6
5	Middle Ditto	31 to 34	1 to $1\frac{1}{8}$	13 6
6	Middle Ditto	35 to 38	1 to $1\frac{1}{8}$	14 6
7	Large Ditto	31 to 34	$1\frac{2}{8}$ to $1\frac{1}{2}$	16 0
8	Large Ditto	35 to 38	$1\frac{2}{8}$ to $1\frac{1}{2}$	18 0
9	Small Rounds	33 to 37	$\frac{7}{8}$ to 1	12 0
10	Large Rounds	33 to 37	$1\frac{2}{8}$ to $1\frac{5}{8}$	13 6
11	Butt blades with one hollow	33 to 37	$1\frac{2}{8}$ to $1\frac{3}{8}$	14 6
12	Butt blades with two hollows	33 to 37	$1\frac{2}{8}$ to $1\frac{3}{8}$	15 0
13	Butt blades with three hollows	33 to 38	$1\frac{2}{8}$ to $1\frac{1}{2}$	16 6
14	Hollow Back Blades	31 to 34	$\frac{4}{8}$ to 1	12 0
15	Large Ditto	31 to 37	$1\frac{1}{8}$ to $1\frac{1}{2}$	18 6
16	Plain Latsons	31 to 34	1 to $1\frac{2}{8}$	13 0
17	Middle Ditto	31 to 35	$1\frac{3}{8}$ to $1\frac{1}{2}$	17 0
18	Large Ditto	33 to 37	$1\frac{5}{8}$ to 2	1 2 6
19	Small Latsons hollow	31 to 35	1 to $1\frac{1}{16}$	13 6
20	Middle Latsons hollow	31 to 36	$1\frac{2}{8}$ to $1\frac{2}{8}$ $1\frac{1}{16}$	17 6
21	Large Ditto	32 to 36	$\frac{3}{8}$ to $1\frac{8}{8}$	1 4 6
22	Ditto	33 to		1 10 0
23	Somitors plaine	20 to 25	to $1\frac{2}{8}$	10 0
24	Somitors with one to two hollows	20 to 25	to $1\frac{1}{8}$	11 6
25	Slip hangers with one hollow	30 to 33	$1\frac{3}{8}$ to $1\frac{3}{8}$	14 6
26	Hangers with two hollows	30 to 33	$1\frac{2}{8}$ to $1\frac{5}{8}$	14 6
27	High Ridge	30 to 34	$\frac{4}{8}$ to 1	14 6
28	Large Ditto	31 to 36	$1\frac{1}{16}$ to $1\frac{2}{8}$	18 6
29	Hollow English Rapiers with Lottors	30 to 36	$\frac{4}{8}$ to 1	14 6
30	English Rapers plaine	30 to 36	$\frac{4}{8}$ to 1	11 6
31	Ditto Cutt through			14 0
32	Portugall Cutts with 1.2. 3. hollows Backs	40 to 48	$\frac{7}{8}$ to 1	18 0
33	India Batts and hangers with 1.2.3. hollows	34 to 37	$1\frac{1}{2}$ to $1\frac{6}{8}$	1 3 0
34	Ditto 1 to 3 hollows	35 to 38	$1\frac{6}{8}$ to $2\frac{1}{8}$	1 8 8
35	Ffoyles ?			10 0
36	Byonetts hollow grind	12 to 14	1 to $1\frac{1}{2}$	9 6
37	Ditto plaine	12 to 14	1 to $1\frac{1}{2}$	7 0

Twelve Anvills
Eleven pairs of Bellows with the Frames
Six Vices
Ten Tow Irons
Sixteen Iron Spindles
Seventeen Glazeing wheeles
Fourteen? little? pulleys
Ten ropes
Ffour earthen Engraving Potts
Twenty three New Patterns No. 1 to 24
Three patterns of Ffyles (files)
Thirty three old Patterns
Ffour hundred and a halfe of Nails
One Old Tempering Trough
Two Spades and aRammer
One How (?hoe)
One Fforke
Three pair and a half of hookes
Five long Iron Wedges
One pair of straightening clows ?claws
Two water hammers
Thirteen two handed hammers
Nine single handed hammers
One Mill Rom ?Rem.
A of Tarred Rope
One pann and hamer
One Shovell
A Brass Rule and Compasses
One Iron Beame
One pair of Scales
Ffour Iron halfe hundred weights
One quarter of a hundred weight
Two seven pound weights
One four pound weight
One three pound and a half weight
Two single pounds
One half pound and a quarter of a pound
Nine Anvil logs
One Iron Hearth of three plates
One Tempering Trough
A pair of bellows
One Anvil One loose Anvil
One Water Hammer
Six dry grinding stones with iron spindles
Five Pullys
Two Iron Spindles with wooden wheels
Four pair of Trundle Heads
Two large Whetstones with Axletrees
Eight pair of wooden Frames



Trouble at Mill

In truth, up until the arrival of Cotesworth at Shotley Bridge, virtually nothing is known regarding the proceedings in the village works. Fortunately, two chests of Cotesworth's documents were rescued from the pulp mill and in them are correspondences with, and regarding, Shotley Bridge. David Richardson did some excellent work on these papers and gives us the following – with no need to elaborate:

January 1705, John Beardmore (of the company) writes:

"Seeing as you say Clem Schaffe is very old pray let us know if he will be able to do our work. If not we will endeavour to get one abroad, but it will be a great trouble and charge for they are very stiff and proud when they know that they are wanted".

P.S. Please send up invoice of four chests of blades sent 30th November".

Then there is this from Dan Hayford:

10th May, 1712, "would consider it a great favour if you can by degree urge payment of £49 10s. 5d., now due from the Germans .... "

In September of the year 1713 Adam Oley joined four other men in a confession of not being able to make ends meet. However, Adam Oley had reached the status of being a Yeoman and was able to barter something in exchange for a loan. Cotesworth obliged with a legally drawn up contract which was signed by Adam Oley. It can be seen that Adam Oley (described as a Yeoman) on the one hand, William Cotesworth on the other hand, by which, as a consideration of a loan of £5 15s. 4d., Adam Oley, agrees to assign over to William Cotesworth his two cows described as 'one all black and the other a hank one withall'.

During the years 1712 and up to his death in 1716, Hermann Mohll was obviously, in his letters to Cotesworth, taking over the full authority of the Shotley works.
As early as February 1711 a letter from him to Cotesworth said:

"we have sent today by John Hindson two boxes of swords (order of the 2nd inst), mixed as the description was not mentioned whether hollow or plain required .... Pray keep £1 from the cost for Henry Wopper .... "

He ends his letter with-

"A happy New Year, Your humble servant to command, Hermann Mohll".

In 1715, when the works were at a low ebb he almost begs Cotesworth's permission for *"we grinders to ground Mr. Hayford's blades made by our smith here .... that is when we have not full employ"*.

He then offers to make an allowance for the use of the mill (*his* grinding mill: KF). Two weeks later Hermann Mohll showed, by an almost despairing letter, that Den (or Dan) Hayford had cast covetous glances at the Shotley works and tried to buy or rent them. Mohll's letter runs-

"Sir, I hope you understand that Mr. Hayford is for the Company Works here"- and Mohll describes how Hayden's engineers measured all housing, shops and mills, taking water levels and *"every thing he cut gite, and that if he had a kindness for the works here or for me to stop him and hold the old 'husie' back for we will all make blaides for rent and pay the rent every month. Some say he is for buying the works as they say the Company will bestow no more money here ... "*

As can be seen by the letter Mohll grows more vehement as he proceeds and now calls Hayford '*a sliye youth*', threatening to buy not one iron or steel from him.

He concludes by praying for, *"a line by bearer whether I have hopes to prevent his aims."* then concludes, *"Your obedient servant to command, Hermann Mohll"*.

To me, this is an historic letter for it seems to have frustrated Dan Hayford's attempts to take over the works. David Richardson.

It can be seen from Mohll's offer to use *his* grinding mill that his autonomy gives him a bargaining position with the company; basically, if the workers are standing idle then they may use Mohll's mill to grind blades made by Adam Oley for Den Hayward. From this it would seem that by 1715 Oley (who was the *only* blade forger in the village) was turning out stock blades independent of the company – in this instance for Den Hayward – and while the grinding mill belonged to Mohll, the workers (except Oley) were under contract to Cotesworth and needed permission to work for anyone else.

What at first I didn't understand was how the workers could owe money to Hayward for iron-ore when Oley was the only forger in the village: it appears that payment for grinding and finishing came from the sale of the blades minus the cost of the iron ore (to Hayward) and Oley's charge for forging it, as well as rent for the use of Mohll's mill.

Now, the business of Mohll's mill…

After the first arrival of Huguenots in about 1630, machines existed in Solingen – and they had to be owned by someone! The Mohll brothers were listed as second generation blade-grinders but, in truth, none of them may have actually been schwertschleifer. I suggest that the Solingen paper-mill left in Harmon's will (*see below*) had originally been the site of the infamous machines, commissioned by Hermann Mohll's father.

Machines were not welcome. It is widely accepted that the Germans did not need them – especially in the light of the enormous and continuous influx of Huguenot immigrants offering a virtually unlimited labour-force.

It was reported by explorer Burton that in the 1860s there were no machines to be found running in Solingen. However, Fritz Weyersberg purchased a patent in England (c.1830) for a blade roll-forge (sic) which was commissioned in Solingen; this machine is still in use today at WKC.

Consequently, when Hermann and Abraham Mohll left for Shotley Bridge they were taking their machines with them, or at least the designs of them, so there were no objections from the Guilds as they were not guild members and not mentioned in the indictment, which is what made me suspicious. The Solingen system made each step in blade production exclusive to one guild, so if the Mohlls were not guild members, it could only be because they were not time-served grinders – just grinding-mill owners.

Because of the quotas and tariffs placed on German imports by the British government, coupled with objections from the guilds, the opportunity to exploit the machines could not be fully realised in Solingen; the Mohlls may have been trying to get them over to England for some considerable time, which would explain the numerous requests by various Germans to the British government et al. for the exclusive production rights of smallswords …using the secret machines!

So the Mohll brothers arrive in Shotley Bridge and set about assembling the machinery. Some of it was certainly active when Angerstein viewed it, and my opinion is that it was there from the start. Then, c.1690, I suggest that the Solingen site was converted to a paper-mill when Abraham Mohll returned, having spent only three years in Shotley Bridge.

….I Harmon Mohll do hereby declare that it is my further Will and pleasure And I do hereby give bequeath unto my sons William Mohll & John Mohll …. to Katherin my wife in the town of Oak … paper millse in the County of Solingen in Germany to be equally divided between them …

Oley Autonomy

This enamelled glass lived in a display case in the Wilkinson Sword factory reception hall at Cramlington. The work of Mary Beilby, it was presented to William and Ann Oley in 1767 by the Beilby Company here on Tyneside, one of the finest glass decorating companies in history. It says "Success to the Swordmakers" on one side, and the initials O W A above 1767 on the other.

The Oleys had been autonomous for over fifty years, but establishing exactly when it occurred was not so simple. We see in the previous chapter that in 1711 Mohll is speaking for the village works, yet we know that Oley had previously been the voice of authority, so it would appear that somewhere after 1713 Oley had completely extricated himself from the control of the company. He signed the 1703 six-year contract, then a three year contract in 1710, so it is likely that after that he was his own man. By 1724, the Oleys had taken over the Mohll works, although Mohlls were still in evidence. Most of the other German settlers had either died or their descendants had moved away by then. In 1733 The Hollow Swordblade Company was sold to Leaton-Blenkinsop, but this was the 'Company' not the Shotley Bridge works, which by then had already belonged to, and been sold, by the Cotesworth estate, to Leaton-Blenkinsop.

Taking into account that the Oleys were forging blades for Den Hayward as far back as 1715, and that by 1724 they owned Mohll's grinding mill, it would appear that the aforementioned William Oley was independent – for better or for worse; for better as it happens.

In the same year the glass was presented (1767), the Beilbys apprenticed Thomas Bewick (who would become particularly famous for his woodcuts) and he was sent on one of his first assignments to decorate sword-blades for William and Nicholas Oley. Up until then it would have been Robert 'Witch' Wilson who was etching, and Angerstein describes in detail the process of acid etching, first using varnish, then sulphuric acid and Spanish Green (copper pigment). Robert was the descendant of another village Wilson who had been etching *and hilting* blades for Bertram thirty years before the arrival of the Oleys. Apparently, Robert had supernatural powers.

Look at the Oley will and you will see a John Wilson 'tenant' in a house and workshop belonging to the Oleys, probably the son of Robert Wilson, certainly another generation of Wilson etchers. Bewick wasn't there long.

Around 1830, an interesting story is told by an Oley descendant regarding his father, 3rd generation William Oley (see page 75), to travelling chronicler William Hone – visiting Shotley Bridge:

> *"James Justice Runkle, a German pedlar, who travelled in this country with his various wares, smuggled over from the continent a quantity of sword-blades, and, with a view of legalizing them and giving them currency, he applied to the father of my informant for permission to put his name upon them. This was accordingly done, and they were sold under the name of Oligar (sic). But government ultimately detected the fraud, and Oley gave evidence in London that the blades had not issued from his manufactory at Shotley."*

History: In 1787, Runkel was brought to trial at the Court of Exchequer for the alleged undervaluing of imported goods. The trial did not run to completion, but concluded when Runkel agreed to settle and pay two thirds of the value of the confiscated swords, as well as all court costs and expenses. His payment came to £1,480.00: a sum that would be worth around £172,600 in today's money.

This 4th generation Oley told Hone that almost all the family production was now of scythes and ploughshares; he also said that some of the family had "…gone to Sheffield… and elsewhere…"!

This is not the first time I have come across this information regarding Sheffield; they are still in evidence in the 1861 census when a 32 year old Charles Olley, scissor-grinder, is living in St Phillips, Sheffield; then in 1911 Robert Oley is in East Brightside and is an iron worker.

The 'elsewhere' was obviously Birmingham, because we find Oleys there long before the Mole boys visibly turn up in the 1830s: William Oley marries (for a 2nd time) in Shareshill, Birmingham, Staffordshire in 1738.

So, we have Oleys in Sheffield and Birmingham, and the Olleys are sword-blade forgers. Forging blades was the most secret process out of all the various stages a blade went through, but somehow the Birmingham sword-making family of Thomas Gill learned both the techniques of forging and of hollowing with the secret machines.

Thomas Gill (III) was noted for the "Never Fail" warranty of his blades, and was way ahead of the competition in Birmingham, even so far as to challenge Solingen import quality. Towards the end of the first half of the 1700s, someone introduced forging skills and the rolling machine to Thomas Gill, a second-generation Birmingham file maker: undoubtably Oleys and Moles.

This photo is cited as Oleys and Molls.

Contentious Tales

Let's begin with a perfect example of an issue that has proven contentious of late: the verification of the heritage of Robert Mole & Son of Birmingham. Robert and John set up shop in Birmingham in 1832 and became hugely successful. For many years everyone accepted they were descended from the Shotley Bridge families and were the link to Wilkinson Sword.

This was another company enjoying similar success in the arms business: started by Henry Knock, a Birmingham trained locksmith turned London gun-maker who had supplied his customers with swords from William Oley in Shotley Bridge. Nock (note name change) left the business to his son-in-law James Wilkinson when he died. In the 1840s, with James's son Henry in charge, they themselves began to produce officer's swords. Curiously, sometime later in 1884, Robert Mole Snr. allowed three of his smiths Tom Beasley, and Johnsons Ernie and Walter (Shotley Bridge Johnsons?) to help current Wilkinson Sword's owner John Latham with a project… probably bayonet production.

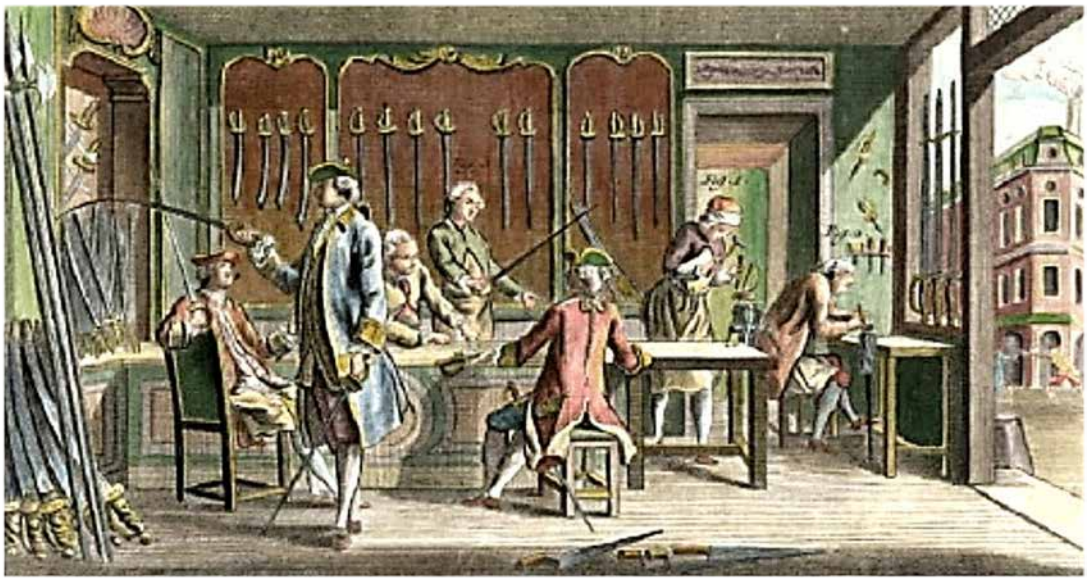
Mole and Wilkinson Sword then worked in parallel supplying the War Office, the Admiralty et al.; and alongside Wilkinson Sword, they produced vast quantities of bayonets and cavalry swords. Finally, in 1920, Wilkinson Sword effected a friendly takeover of the Mole company.

When Wilkinson Sword gave up sword manufacture in 2005 they sold all their equipment to Solingen swordmakers *Weyersberg, Kirschbaum and Cie.* This completed a three hundred year circle of Solingen back to Solingen which was an attractive concept. However, descendant Robert Wilkinson-Latham wrote that when researching the Moles of Birmingham he could find no connection with the Mohlls of Shotley Bridge. Apparently the problem was simply records of births, deaths and etc. lost in a parish fire.

Until its withdrawal from the sword business, Wilkinson Sword maintained a special relationship with Shotley Bridge, displaying Shotley Bridge swords at their headquarters, alongside the glass commissioned and made by the Beilbys for William Oley. Plus, in 1988, they began – unrealised – plans to house their multi-million pound sword collection in a purpose made museum on Wood Street in Shotley Bridge. There is no doubt Shotley Bridge Mohlls became Birmingham Moles.

The most commonly told fable regarding the swordmakers is that of the sword in the hat. The trouble with this story is, like most folktales, it was never written down at the start and has always been simply retold – then written down after the fact by everyone from the descendants themselves to chroniclers looking to spice up the atmosphere of the history. It is also tenuously associated with a semi-mythological swordmaker up in Scotland called Andrea Ferrara (spelling varies); although how they came to adopt this person as their own belongs in the twilight zone – like many myths. King James IV of Scotland supposedly brought this revered smith from Italy to teach Scottish bladesmiths. In fact, for centuries, Solingen supplied the Scotts with blades marked with the name Andrea Ferrara, implying extra high quality, just as they had purloined the symbol of the Passau Wolf for precisely the same reason centuries before; ironically, their quality being so consistently high, they didn't actually need either.

Still, our story, regardless of association, is an amusing and entertaining tale, so let's keep it going. At this point it should be explained that one of the vital qualities looked for in a sword-blade was its flexibility; you cannot do anything with a bent or broken sword, and British swordsmiths had not mastered the processes of forging hard, sharp, *flexible* blades. A much repeated, ridiculous description of fine blades was that they could be bent so the point came around to meet the hilt then spring back unaltered. A degree of flexibility is a prerequisite obviously, but only sufficient to prevent losing true was all that was required. Still, like everything sold and owned, the vendor and the customer need a sales pitch. Nothing ever changes.



It was told that, in Newcastle, one of the Oleys became embroiled in a heated debate about who owned (or made, as versions vary) the finest sword; so a meeting was arranged for the men involved to present their swords for qualification. Nothing *has* changed, has it?

Anyway, they all meet at an inn at the allotted time to present their swords for inspection, all except for Oley who arrives unarmed – leading everyone to believe he had cold feet. No such thing, for he removes his hat and coiled around the inside is his sword (or blade, versions vary). Attempts to uncoil it result in lacerations, so tools are supplied, it is released, and it springs back straight and true, thus winning the bet for Oley.

Now, if you disregard all the attendant details regarding hilts and hat styles, it is certainly possible that a razor-sharp, spring-steel blade was involved; there remains technological veracity in that possibility today and the same was most probably true with those German blades.

So, that's the sword in the hat accounted-for, now we come to The Crown.

It is attested that, on or about 1800, a nationwide competition was held in London to establish the finest swordmaker? sword? or sword-blade? with cousin Robert Oley attending. Needless to say, Oley took the day and was presented with a crown as a prize; their village pub was accordingly renamed *The Crown* and Crossed Swords. Considering the pub was still officially named 'The Crossed Swords' in 1855, this story is purely apocryphal; no mention is made in the London Cutlers Guild history – the most likely judges. I have not yet discovered why 'The Crown' was added.

This brings us to another myth: there was some reported connection with excessive libation that resulted in a reputation for wanton drunkenness amongst the Germans, but it needs to be declared that those casting the stones were ladies from a growing Temperance movement in the village.

Now we encounter a modern-day curiosity courtesy of David Richardson himself when he declares in his book that one of the important reasons for choosing Shotley Bridge, or more particularly the Derwent River, was that the waters were/are radioactive. He makes no reference to the source (!) of this implication, nor of any subsequent qualification of the fact. Seemingly, this property accounts for the superior tempering quality of the water, as it did the Tagus, and we know how important that is, given an absence of red-headed boys and three year old goats. I am not about to cast any aspersions on Mr Richardson, so make up your own mind.

Lastly. Most importantly: the **Bushy Tailed Fox** (BTF), because I have found this an issue of extreme contention. It has been declared on many occasions that the Passau/Running Wolf was the defining mark of the Shotley Bridge swordmakers – which is incorrect, yet this association has endured over many years and across the Militaria world; certainly interested parties on Tyneside would attest to this… so why?

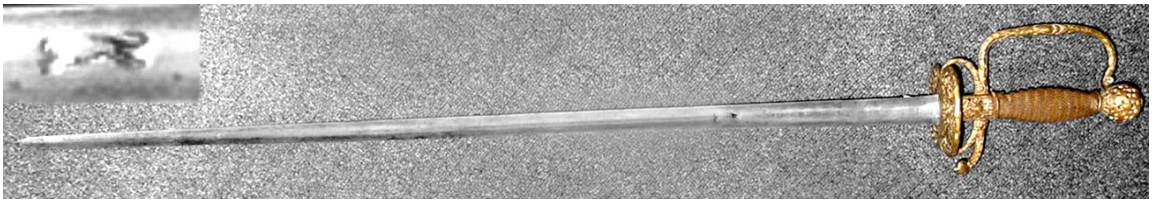
Considering that for a long time the only blades marked SHOTLE BRIDG (or variations thereof) have also included a wolf, then an association seems obvious, but that is not the case. The reason they were marked with the wolf is because they were smuggled blades brought over from Solingen by the Mohlls (see p.41). As it turned out, and as was intended, those early blades with the wolf and script invariably went to wealthy local Jacobites. Ostensibly, this all stopped once 'Williamite' Stephan Evance took over the Hollow Sword Blade Company. Subsequent munition's-grade blades only carried the words SHOTLEY and sometimes also BRIDGE.


script enhanced slightly

After 1713, the independent Oleys established the Guild of the Running Fox and resumed marking the blades with their family's Bushy Tailed Fox.

All this would have been fine, had not the Birmingham swordmaking dynasty of Samuel Harvey (I, II & III) et al. started buying unfinished blades from the Oleys and – to ensure the Tower knew who to pay – adding their names or initials to the fox. This practice was subsequently followed by other Birmingham smiths. Recently, all BTF blades have been regarded as Birmingham blades from those smiths, but there are quite a lot of *un-named* BTF blades around, and the question I asked everybody was: "Why don't they have names or initials?" The stock, un-informed answer was that it must be other Birmingham smith stealing it to establish pedigree. I didn't agree, but I had not been able to make an early connection between Shotley Bridge and the BTF until I found this broadsword bladed smallsword of a style consistent with others from the late 17thc. The description provided by the auctioneer detailed: "…*TLE xx on one side and BRIDG xx on the other, with a wolf on each*" (sic). When I began to enhance the image in Photoshop I realised it was not a wolf but a Bushy Tailed Fox.

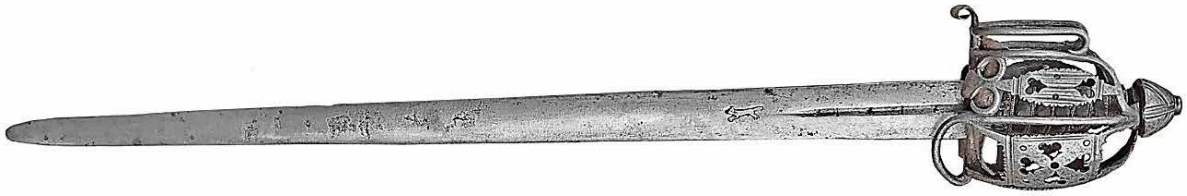
The enhanced inset is the best my software could achieve given the quality of the source photo; regardless, the 'bushy tail' is in evidence.



If you go back and look at the images of the various Passau Wolfs used over the years you will see that none of them even slightly resemble the BTF. Prior to this discovery I had no definitive evidence that the BTF existed before its common appearance, the earliest of which was from c.1740; this smallsword is from the end of the 1680s.

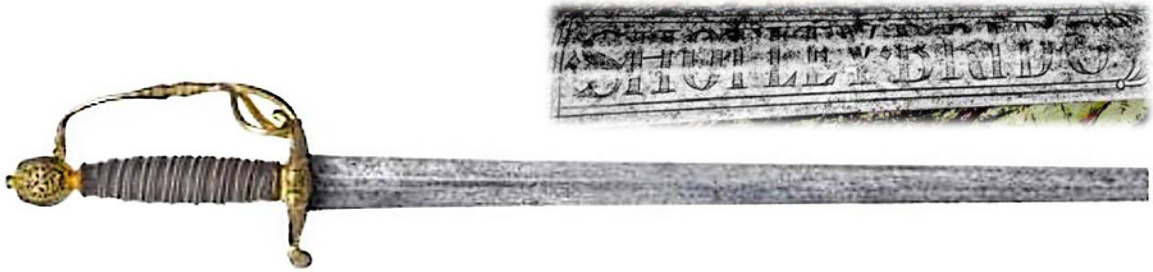
What this implies is that the consensus of opinion regarding the Oleys' use of the BTF (and by confusion the Passau Wolf) is based on fact; and their decision to name the guild 'The Running Fox' was based on the family's early use of the BTF marking. It is beyond question that the above sword is a Shotley Bridge product released sometime towards the end of 1688 and before Evance took over The Hollow Sword Blade Company.

However, there is more evidence: an early 1700s dirk made from a cut-down back-sword blade from the Tony Willis collection. Sword carry had been prohibited in Scotland, so long dirks (20") had become the best possible alternative. Below is the same fox on this basket hilted broadsword; given the quality, it is probably a clan chief's that survived the '15 and '45.



I've recently found another two examples: a horseman's sword auctioned at Olympia in 2022; and a hunting hangar in the Royal Armouries (IX.1174).

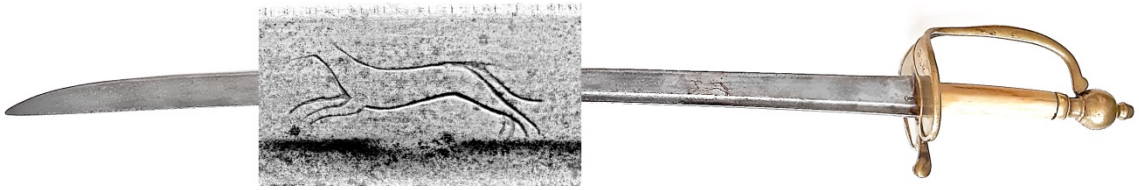
I have discovered some other curiosities during my tireless search for Shotley Bridge swords, a search which involved monitoring the dealers and auction-houses over the last six years on a 7/52 basis. I found this sword:



it was made for Sir Hugh Pennyman, Colonel of the Cleveland regiment of the North Yorkshire Militia, and Sheriff of Yorkshire; needless to declare – he was a Jacobite.

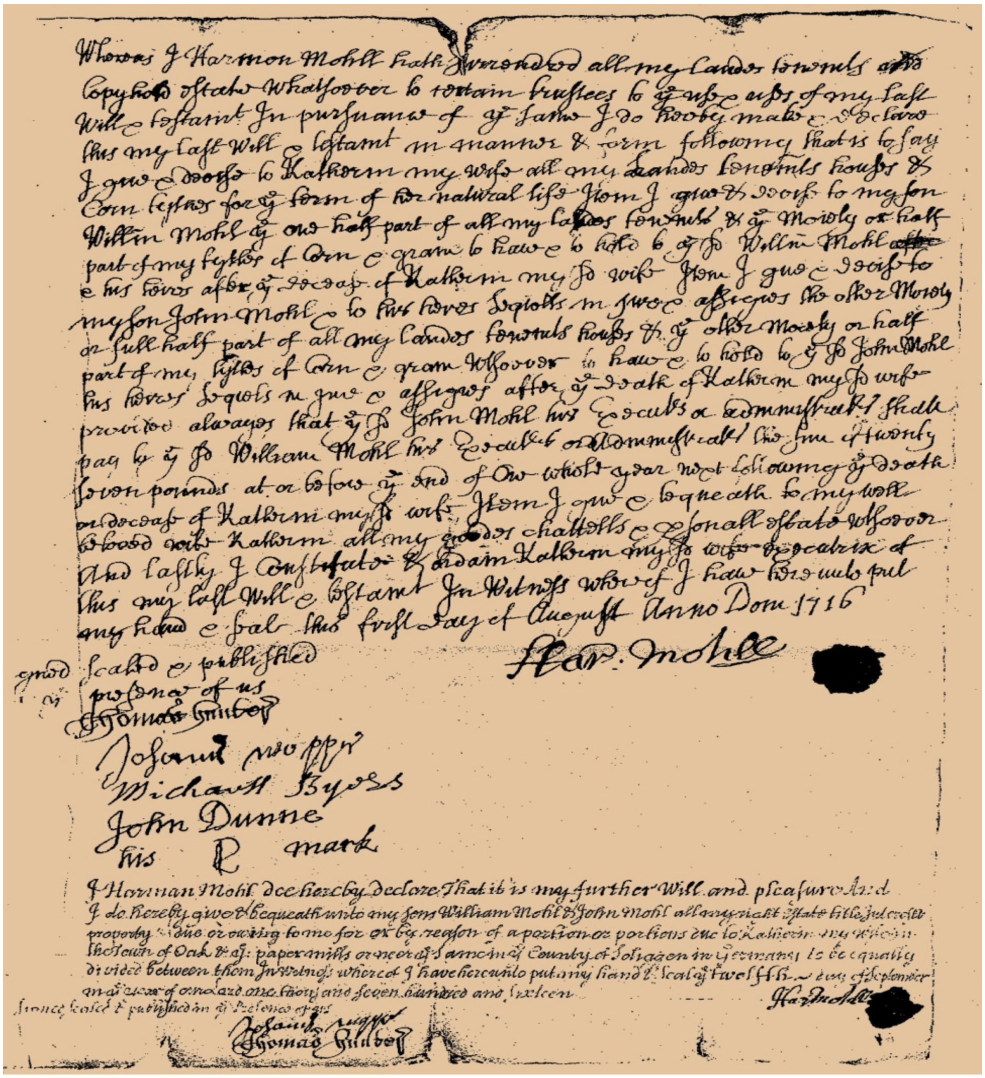
Below we have a late example of a colichemarde with silver hilt, and a blade etched in Shotley Bridge in 1767 by famous local artist Thomas Bewick – apprenticed to the Oleys during his early years with the Beilby glass company – using a stylised version of the Oley family's bushy tailed fox. That impressive style of fox has materialised on other blades on more than one occasion.

Lastly, a mid.1700s Oley-made cavalry hangars with the ubiquitous BTF. Hundreds of these (unfinished) blades were purchased by the Birmingham smiths and thousands more went to the Tower. This blade would end up proofed and assigned to an unknown 2nd battalion.



Business as usual

Time passes, trade is up and down, that was usual in the sword-blade business. I don't know if Hermann Mohll continued supplying the Jacobites but I suspect he did. When Cotesworth got involved with the business, great care had to be taken as he is on record as having financed and supplied local militia fighting for Newcastle *against* the Jacobites, so nothing will have come out of the village. It is obvious that great care *and* surreptitious dealings were the order of the day; I also think that Hermann Mohll became rather wealthy as a result. Remember, he still owned the big grinding mill just in the shadow of the bridge, and the paper mill in Solingen had obviously come to him, presumably when his brother Abraham died. Below: This is a copy of the will of Harmon Mohll and a (best effort) transcription.


Whereas I Harmon Mohll hath surrendered all my Lands tenements and
Copyhold estate whatsoever to certain trustees to the use uses of my last
Will & testament In pursuance of the same I do hereby make & declare
this my last Will & testament in manner & form following that is to say
I give & devise to Katherin my wife all my lands tenements houses &
Corn lofts for the term of her natural life Item I give & devise to my son
William Mohll the one half part of all my lands tenements & the Moiety or half
part of my lofts of Corn & grain to have & to hold to the said William Mohll after
& his heirs after the decease of Katherin my said wife Item I give & devise to
my son John Mohll & to his heirs [illegible] the other Moiety
[illegible]
this my last Will & testament In Witness whereof I have hereunto put
my hand & seal this first day of August Anno Dom 1716
Har. Mohll
Signed sealed & published
in presence of us
Thomas [illegible]
Johann [illegible]
Michael Byers
John Dunne
his mark
I Harman Mohll doe hereby declare That it is my further Will and pleasure And
[illegible]
Har. Mohll
[illegible]

Whereas I Harmon Mohll hath surrendered all my lands formerly and? Copyhold o…..? whatsoever to certain trustees so the use … of my Last Will and Testament. In pursuance of the same I do hereby make and declare this my last Will and Testament in manner and form following that is to say I give and devise to Kathron my wife all my Lands Tenements Houses and Corn …. for the term of her natural life ITEM I grant ….. to my son Willin Mohl the one half part of all my lands ……and the Moiety or half part of my ……..of Corn and grain to have and to hold to the said Willin Mohl and his heirs after the death? of Kathron my said wife ITEM I give and devise to my son John Mohl to his ….. …….. . …… m …..assigns the other Moiety or full half part of all my lands ….. houses … the other Moiety or half part of my …… of Corn and grain ……to have and to hold to the said John Mohl his heirs …. M …. …. After the death of Kathron my said wife provided always that the said John Mohl his Executors and administrators shall pay to William Mohll his Executor …… ….. … … from pounds at bor before the end of one whole year next following the death or ……. Of Kathron my said wife Then I give and bequeath to my well beloved wife Kathron all my goods chattels x x for al of …. And lastly I constitute and ordain Kathron my said wife executrix of this my last Will and testament In Witness whereof I have hereunto put my hand and seal this fifth day of August Anno Dom 1716

Signed sealed and published (signed) Her. Mohll LS
and in presence of us Thomas ……Jo Hoppier Michael Byess…….John Dunne his R mark

I Harmon Mohll do hereby declare that it is my further Will and pleasure And I do hereby give bequeath unto my sons William Mohll & John Mohll all my right estate title interest properly due or owing to me for or by reason of a portion or portions …. to Katherin my wife in the town of Oak …?… paper mills or near the same in the County of Solingen in Germany to be equally divided between them In witness whereof I have hereunto put my hand and seal the twelfth day of September in the year of our Lord 1716

Signed sealed and published (signed) Her. Mohll LS

In the presence of

It would appear that the Oleys were the ones actually investing in the village because in 1724 (curiously, the year the syndicate fell apart) William Mohll (2nd generation) sold his estate to Oley, having first advertised the property for sale; it is speculated it was for legal reasons; Mohll died two years later:

> **Newcastle Courant** "To be sold, a sword grinding mill with about 8 acres of ground, a very good head of water situated on the Derwentwater in the County of Durham. Also a very good house etc., all now within the possession of William Mohll at Shotley Bridge, who will treat with anyone about the same".

Others were still maintaining homes and estates back in Solingen; for example:

> "John Voes, of Shotley Bridge, sword-grinder, gives his estate in Germany, called by the name of Anffemhewman, being in the county of Dusseldorf, to be disposed of by his brother Johannes Smithart, of Soiling, for the benefit of his wife and children, Johannes and Margaret; father-in-law, Geo. Joplin, Christopher Harrison, and Theoph. Smith, his brothers-in-law, tutors, &c."
>
> Signed Jan. Vous. Witness Wm. Buske, John Woffer, jun.

Some never returned home to Germany: fourteen Mohlls/Moles are buried in Ebchester parish between 1716 and 1800, and this excludes those who moved away or women who married away from the name.

William Mohll and his son John (the younger) had changed their name, first from Mohll to Moll, then Mole when they witnessed Oley's will in 1810. It is on record that John (Jr) Mole and Robert (Sr) Mole (the son of John Jr) moved to Broad Street, Islington, Birmingham in 1832. Confused?

OK, while on the subject of wills, here is the William Oley will of 1810 (the date of death) that is the positive indication of the size of the estate actually acquired in the village.

William, the grandson of Adam Oley (the original immigrant), built Cutlers Hall, established The Guild of the Running Fox, employed Thomas Bewick, and etc. He had three sisters but no brothers; three sons: William, Nicholas and Christopher; plus one daughter, Mary. Notice the witness John Bell; and also the change of names from Mohll (in their father's will) to Mole in Oley's; or save your eyes, a precis follows.

Received from the Registry of the Consistory Court of Durham.

In the Name of God Amen I William Ray of Shelley Bridge in the Chapelry of Meadowfoot and County of Durham Cloth Maker being of Sound and disposing mind and Memory do make and ordain this my last Will and Testament in manner and form following that is to say) Imprimis I will that all my just debts and funeral expences be paid and discharged by my Executors hereinafter named. Item I give and bequeath to my Wife Ann the Interest of Three hundred pounds to be paid her quarterly as the same shall become due and also the Dwellinghouse that I now live in with the whole of my household Furniture for her natural life or as long as she shall continue to be my Widow and at my said Wifes decease or ceasing to be my Widow I then gave and bequeath my said household furniture in equal shares amongst my four Children, William Ray Nicholas Ray, Christopher Ray and Mary Brown and Likewise I give and bequeath to my said Wife my Cow to be at her disposing off. Item I give & bequeath to my Eldest Son William my Freehold Estate situate near Shelley Bridge commonly called Cottons Close with all the Buildings and erections thereupon and a Piece thereto adjoining with all appurtenances and also a Copyhold House and Garden at Shelley Bridge now tenanted by John Wilson and the Shop that he at present works in and one hundred pounds at the decease of his Mother. Item I give and bequeath to my Son Nicholas Ray all my Copyhold premises at Shelley Bridge which I lately purchased of Mr John Johnson (except a Shop that my Son Christopher Ray now works in and the two Coal Houses at the end of the said Shop which I herein gave and bequeath to my Son Christopher) And I likewise give and bequeath to my said Son Nicholas the Shop that he now works in and also a Copyhold House on Bonfieldside Bank on the South Side of the Plantation and also one third part of the Wood and Plantation on Bonfieldside Bank aforesaid and further I give and bequeath to my said Son Nicholas the Sum of one hundred pounds at the death of my said Wife or her ceasing to be my Widow. Item I give and bequeath to my Son Christopher Ray my Freehold Close at Shelley Bridge aforesaid commonly called Powels Garth with the appurtenances with the Dwellinghouse and Garden that I now live in at the decease of my said Wife and also my Great House now occupied by John Bradshaw and Mr Peebles and two old Shops now in ruins and a Butchers Shop now occupied by John Wood also the whole of my Cottages from Mr Gray to the Bottom of the Village of Shelley Bridge all Coundering upon the Mill race one third share of the Plantation before noted and also one hundred pounds at the Death of my said Wife or in her ceasing to be my Widow. Item I further give and bequeath to my Son William a New House at Shelley Bridge now tenanted by John Donaldson Coundering upon the Mill race with the appurtenances and also one third share of the Plantation before noted. Item I give and bequeath to my three Sons William, Nicholas and Christopher in equal Shares my Coundering Mill and Warehouse with the Ground above Cutting against the Bridge to be their and their Heirs for ever Laying no doubt upon it and to be at equal expences in repairing the same when wanted. Item I give and bequeath to my Daughter Mary Brown the Copyhold House at Shelley Bridge aforesaid that she now lives in and her decease to go to her Son William Ray Brown with the length of ground on the Back Side thereof but the Lath adjoining the said Dwellinghouse with the ground backward adjoining the same I leave and bequeath to my said Son Christopher Ray. Item I further give and bequeath to each of my said Sons William, Nicholas and Christopher all my Work Tools now and usually employed in the Shops hereinbefore given and bequeathed to each of them Saws and except the Old Bellows and Anvil for the equal use of my said three Sons and further out of my Cash in hand Debts due and owing to me upon Bonds Note of hand or other Securities together with all debts due and owing to me by Trade as soon as they shall become due and paid I give and bequeath to my Son William Ray One hundred pounds; to my Son Nicholas Ray one hundred pounds and to my Son Christopher Ray two hundred pounds to be collected and paid by my Executors within one year after my decease or as soon after as the Bills in a State shall become due and can be collected and Whereas in the several Bequests above of Freehold and Copyhold Estates the word Heirs have been by mistake omitted, in this Will and Testament it is to be understood that the said several bequests of Copyhold and Real Estates are given and bequeathed to each and their Heirs and Lastly I make and constitute my said Son Christopher

and Mr William Wray of Newbiggin Executors of this my last Will and Testament. N.B. My Will further is that should my effects for the payment of my last bequeathed Legacies to my three Sons by Debts or otherwise fall short of fully paying the said several Legacies the deficit to be suffered each of my said Sons in proportion to the sum bequeathed each. In Witness whereof I have hereto set my hand and Seal this tenth day of August 1811 William Ray (LS) Signed sealed published and pronounced by the said William Ray as his last Will and Testament in the presence of us who in his presence and in the presence of each other have hereunto subscribed our names. John Bell. John Wade. William Wade Jr.

On the 13th September 1811 the Will of William Ray late of Shelley Bridge Coal maker deceased was proved by the Oath of Christopher Ray (the Son) one of the Executors in the Will named having been first duly sworn to Administer. A Power reserved to William Wray the other Executor when he shall apply for the same. Effects under £800.

Joseph Dawson
Deputy

Collated by

Precis: August 10th 1810. The last Will and Testament of William Oley; witnessed by John Bell, John Mole and William Mole.

Given to sons William, Nicholas and Christopher in equal shares: grinding mill and warehouse with the ground above butting against the bridge (plus all tools individually used) but old bellows and anvil to be shared jointly. Interest on £300 paid quarterly to wife Ann, also present dwelling house.

William: copyhold Cutler Hall and all associated; (plus house and workshop tenanted by *John Wilson*) plus £100 on decease of his mother Ann. Also, new house bordering on mill race, tenanted by John Henderson, plus land at Plantation.

Nicholas: all property recently purchased from John Johnson (except shop and two coalhouses of Christopher) and shop Nicholas works in; plus land at Benfieldside Bank plus £100 on death of mother.

Christopher: freehold Fawcets Garth including house on death of Ann; plus property Great House (tenanted by John Redshaw and Mr Mabbel); two old shops in ruins; butcher's shop (John Wood); all cottages from Mr Gosley to Bottom of village bordering on mill race; land at Benfieldside Bank Plantation plus £100 on death of mother

Mary: copyhold house with grounds; to go to son William Oley Brown on her death.

William and Ann Oley lived in Cutlers Hall at that time, dedicated in 1787, one hundred years after the first arrival of the family in Shotley Bridge.

Swords into Ploughshares

We've seen Mohll put his business and the careers of his family into the hands of Oley, who was then long-since independent of syndicates and companies. We now know that there was some movement of skills down to the developing Midlands, but there was also some moving into alternative careers. For example, one of the Oleys went over to South Shields to work the coal-mines, and some of his decedents remain there.

Joseph Oley (see below in his garden), son of Christopher, born 1804, and fourth generation in the line of Oley bladesmiths, was a blacksmith/cutler/whitesmith until 1840, then spent 50 years as a local auctioneer and died aged 90.

Around the time that Jos was – allegedly – forging his last blade, the Shotley Bridge Spa was opened by Johnathan Richardson Sr. which turned the village into a favoured attraction and had guests as eminent as Charles Dickens visiting to take the waters and cures. He said the water "tasted like poison".

Also, around 1840, there was the beginning of the Derwent Iron Works, essentially the forerunner of what would ultimately become British Steel's Consett Steel Works.

Author David Richardson (whose maternal gran was an Oley) tells of his meeting with Nicholas Walker Oley (who died in 1964) and how he examined the sword taken down from the wall and declared it the last sword tempered in the River Derwent by Jos Oley.

Left is a photo of Nicolas taken during a newspaper interview holding *that* last sword. He had moved away to work in the coal-mines, then finally to the steel-works. You can see that the sword is a typical mid.1700s Cavalry hangar, which raises questions regarding its provenance, because this is a style of sword far pre-dating Jos Oley and certainly never forged – nor hilted – by him.

Domestic and farm tools are often mentioned as 'fall-back' production during weak demand for arms. There has been a somewhat derisory overtone to statements from some chroniclers regarding this diversification. I feel this is at least unwarranted, and at most impertinent; these craftsmen produced blades of the finest quality – regardless of their purpose. I recently acquired a kitchen knife *(36cms)* from the early 1700s *(see below)* and it has obviously been used for a long, long time and re-sharpened till the cutting edge is now curved. It is still frighteningly sharp and, although the carbon steel has inevitably pitted over the two-plus centuries of its life, it remains an eminently serviceable implement, and proof of the impertinence of all derogatory aspersions cast at the Shotley Bridge blade-smiths' eminence.

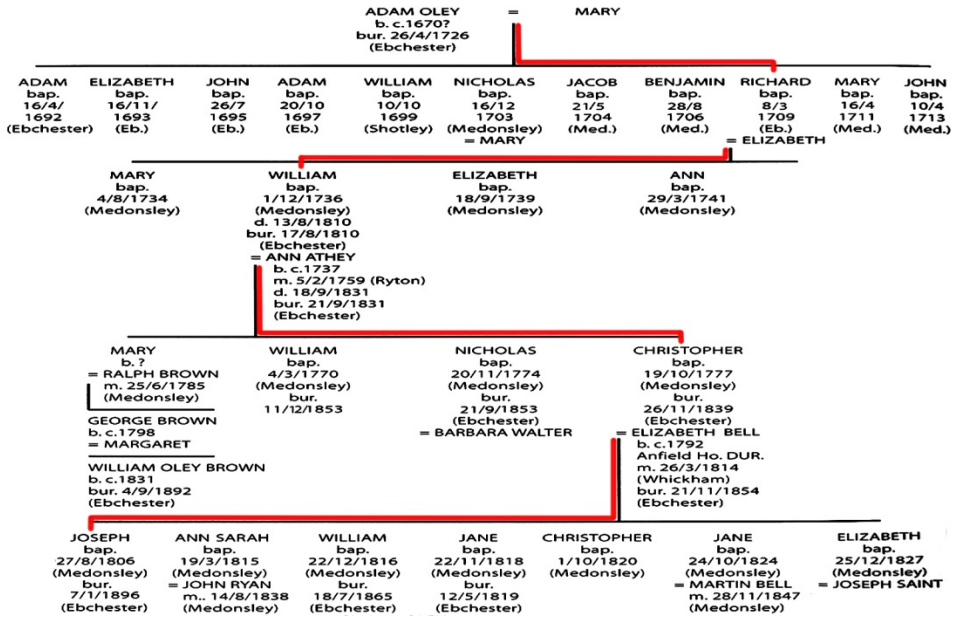
(above images not to scale)

THIS IS TO ACQUAINT THE PUBLICK,

THAT there will be a Sale of SCYTHES, at Shotley-bridge, (which is made there) on Friday the 11th of June, 1756, being Barnabas Day; and are the beſt that ever were known to have been brought into this Country, and are proved to be ſuch, in the moſt chief Towns and Villages in ſeveral Counties, viz. Newcaſtle, Durham, Carliſle, and Berwick upon Tweed, &c. &c. Where Tradeſmen and others may be ſerved in the beſt Manner, with ſeveral Sorts and Lengths at low Prices, viz from 1 s. 10 d. a ſingle Scythe, or 22 s. a Dozen, to 30 s. and ſo upwards to 3 l. per Dozen: Gentlemen may alſo be furniſhed with Garden SCYTHES, at low Prices. Thoſe who pleaſe to favour them with their Orders, (with the Length of the Scythes uſed in that Country) ſhall be as carefully complied with as if preſent, by applying to Mr Cuthbert Beckwith, at Shotley-bridge aforeſaid, (being 12 Miles from Durham, Hexham) and in Newcaſtle by the Maker, GEO. BLENKINSOPP.

Where may be ſeen, the Scythes and Sword Blades made and ground; the Mill, with the ſeveral Movements made by one Wheel, contained therein, erected for thoſe Purpoſes only.

Oley fortunes – Timeline



1687	Adam Oley arrives in Shotley Bridge
1703	Oley signs a contract with Company for 6 years
1710	Oley signs a contract with Cotesworth for 3 years
1711	Mohll begins speaking for the village works
1713	Oley is a Yeoman: independent of the company
1715	*Jacobite rebellion begins at nearby Dilston Hall*
1724	Company Charter cancelled
1724	Mohll's mill and house sold to Oley
1726	Adam Oley died age 66
1736	William Oley 2nd born: son of Richard; grandson of Adam 1st
1740	*War Austrian Succession*
1742	Approx. first appearance of BTF Hangars in the UK
1744	*Carnatic wars until 1763*
1745	*Jacobite rebellion*
1754	*Seven Years war*
1754	Angerstein reports Oley is making smallswords
1766	*Anglo-Mysore war*
1775	*1st Anglo-Maratha war*
1775	*American Revolution*
1787	New Cutlers Hall built by William (2nd)
1792	*French Revolutionary wars*
1810	William 2nd dies; his estate is substantial: see will

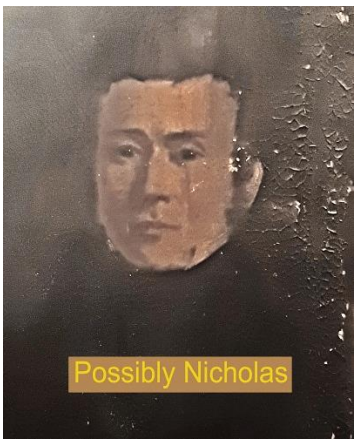
When William Oley died, the family owned much of the village, and they didn't achieve that by making only smallswords, scythes and kitchen knives. For decades Uncle Richard, then his son William, produced thousands of sword-blades that were sold to The Tower and independent militia.

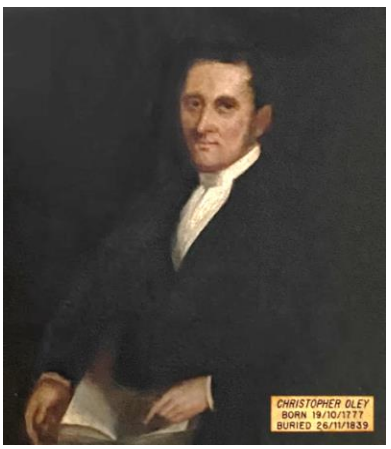
Because of the previous lack of information regarding the Oleys' autonomy, general opinions regarding their success and that of their village have often been linked to the Company and its fiscal disasters… this was not the case. From the time Adam Oley attains independence (c.1713) the demand for blades – military and civilian – rarely ceased, and the Oleys were recognised nationwide as suppliers of the finest quality sword-blades to be found anywhere in the world.

Swedish spy Angerstein declared in 1754 that the Oley output *he witnessed* was predominantly hollow-blades for small-swords; and by 1767 Thomas Bewick was employed etching William Oley's dress-sword blades; the demand for hollow-blades was at its height during that period.

The Oleys named the guild they established as The Guild of the Running Fox and, by the 1740s, the blades they were sending to Birmingham and the Tower sported the family's bushy tailed fox mark. At first I assumed that Birmingham smiths Harveys, Wooley et al. had illegally commandeered the symbol of the bushy tailed fox to indicate quality and prestige, but it has now become apparent that they were buying raw blades from the Oleys, finishing them, and adding their names or their initials to ensure they got paid their due when selling them on to the armourers at The Tower etc.

It has been reported, and appears to be correct, if these self-indulgent portraits and the new Methodist Chapel of 1814 are anything to go-by, that William and Mary's sons, faced with a dwindling market for their swords, settled down to promoting the 'Good Word' to the locals. One of them, at least, would continue to work the forge and produce the farming and domestic utensils, probably William (the first born). The portraits are courtesy of Mrs May Bell (R.I.P. 2023); the damaged portrait is unattributed but suspected of being Nicholas.





Village Life

There are descendants of the German families alive and kicking beyond Tyne and Wear, in fact all round the world, so I feel that some of the information I have unearthed deserves to be included in this book. Such details as we have regarding births, marriages, deaths, village activities etc. are vital in presenting a human face to the tale, but we must not overindulge outsider's attention. So here we have just enough information to maintain coherence without overloading said attention.

Firstly, here are some names of German workers who would subsequently appear: Balfe, Busk, Faws, Henschalls, Grouts, Palds and Wolferts. Of these, only Wolferts were from a recognised Solingen dynasty (actually a very important family with multiple lord mayors for instance) the rest would be labourers, skilled to varying degrees. No information is readily available regarding their arrival or departure, except for the Grouts who, in 1691, shared in a tenancy with Mohll, Schimmelbusch, Kratz and Voes.

1691, as dated on the lintel of 44 Wood Street, Adam Oley dedicates the first Cutlers Hall. The Oleys had been Lutheran ministers for generations and Adam was no different. It is understood that Cutlers Hall was used as their chapel until 1814 when Christopher Oley built the new one seen in my montage on page 38. They were both used as schools. Oley's workshops were on either side of 44 Wood Street.

In this same year of 1691, Sir Ambrose Crowley arrived downstream at Winlaton and began developing his iron and steel business.

1691 was a busy year when you remember that the Royal Charter also materialised that year.

In 1692, Hermann Mohll baptised a son – James. The next parish mention of the Mohlls was 1700 when daughter Catherine married John Vose and their new-born daughter Elizabeth was buried a year later.

Also in 1692, Henry Wupper's son John was born.

Then in 1694, Engel Schimmelbusch was buried in Ebchester churchyard.

That same year, Adam and Mary Oley buried their three-year-old – third son – Adam, also in Ebchester. They would baptise thirteen children in all; blacksmiths have a healthy appetite.

1714 Peter Tiergarden died on 5 February; Oliffe Groats died about the same time; then John Voes (Voss) died in 1721.

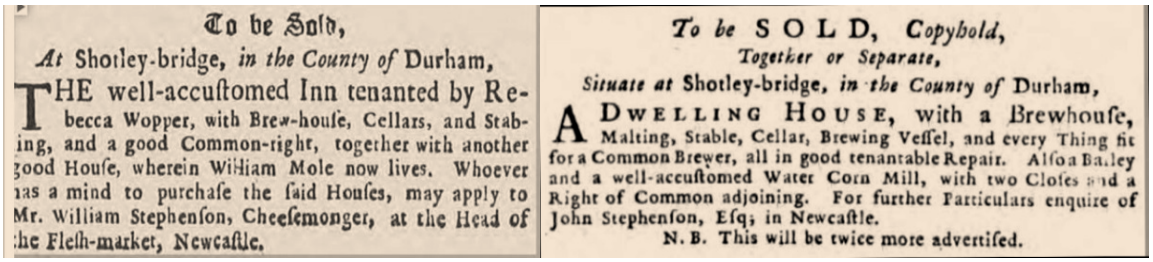
There are the English names directly associated with the village: Johnson, Leaton and Blenkinsop; these families had indentured sons who would *supposedly* end up with sword-making businesses; maybe the Johnsons did.

Leaton *supposedly* signed his blades but no-one has ever seen one; the Leatons would marry into the Blenkinsop family and move up several social rungs, eventually owning the Hollow Sword Blade Company and what was left of company-owned works in the village (excluding Oley's possessions).

1733, a Leaton and partners financed the building of the cementation furnace at Derwentcote.

Sandford or Sampford (of syndicate association) also had an interest beyond the Hollow Sword Blade Company and in 1694 he leased a corn-mill in the valley at nearby Lintzford; the annual rent was £7 and '…one sword-blade well-made and tempered'. There is no indication that he used the mill to produce blades; by 1703 it was in use as a paper mill.

Beer is next on the list and the first positive indication of the German connection with the pub is when this notice appears in 1739, followed by a further notice in 1749:



To be Sold,

At Shotley-bridge, *in the County of* Durham,

THE well-accuſtomed Inn tenanted by Rebecca Wopper, with Brew-houſe, Cellars, and Stabling, and a good Common-right, together with another good Houſe, wherein William Mole now lives. Whoever has a mind to purchaſe the ſaid Houſes, may apply to Mr. William Stephenſon, Cheeſemonger, at the Head of the Fleſh-market, Newcaſtle.

To be SOLD, *Copyhold*,

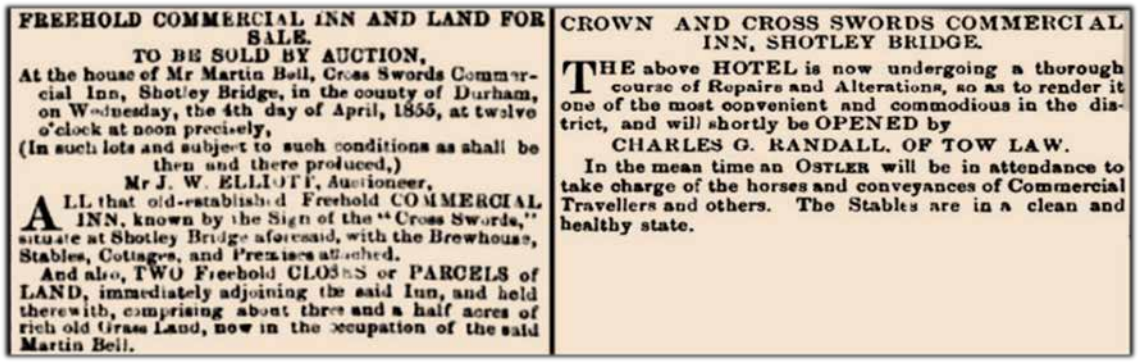
Together or Separate,

Situate at Shotley-bridge, *in the County of* Durham,

A DWELLING HOUSE, with a Brewhouſe, Malting, Stable, Cellar, Brewing Veſſel, and every Thing fit for a Common Brewer, all in good tenantable Repair. Alſo a Bailey and a well-accuſtomed Water Corn Mill, with two Cloſes and a Right of Common adjoining. For further Particulars enquire of John Stephenſon, Eſq; in Newcaſtle.

N. B. This will be twice more advertiſed.

Following the death of proprietor Christopher Oley in 1839, Martin Bell was running the pub for his sister – Oley's wife; then in 1855, just after her death, the entire property was to be sold (note the name of the pub!). In 1862 it was being re-furbished by Mr Charles G. Randall and it would appear that at this point the Germans were probably no longer connected with it. Why was *Crown* first, and finally added to the name, and by whom?



FREEHOLD COMMERCIAL INN AND LAND FOR SALE.

TO BE SOLD BY AUCTION,

At the house of Mr Martin Bell, Cross Swords Commercial Inn, Shotley Bridge, in the county of Durham, on Wednesday, the 4th day of April, 1855, at twelve o'clock at noon precisely,

(In such lots and subject to such conditions as shall be then and there produced,)

Mr J. W. ELLIOTT, Auctioneer,

ALL that old-established Freehold COMMERCIAL INN, known by the Sign of the "Cross Swords," situate at Shotley Bridge aforesaid, with the Brewhouse, Stables, Cottages, and Premises attached.

And also, TWO Freehold CLOSES or PARCELS of LAND, immediately adjoining the said Inn, and held therewith, comprising about three and a half acres of rich old Grass Land, now in the occupation of the said Martin Bell.

CROWN AND CROSS SWORDS COMMERCIAL INN, SHOTLEY BRIDGE.

THE above HOTEL is now undergoing a thorough course of Repairs and Alterations, so as to render it one of the most convenient and commodious in the district, and will shortly be OPENED by

CHARLES G. RANDALL, OF TOW LAW.

In the mean time an OSTLER will be in attendance to take charge of the horses and conveyances of Commercial Travellers and others. The Stables are in a clean and healthy state.

This photo below is from 1905; taken by schoolmaster William Lubbock, a local amateur photographer, it is important because the young lad standing in the middle of the road wearing a wide straw hat and carrying a cane and jam-jar (for catching tiddlers) is a Wilson descended from the 'Witch' Wilson family line of sword hilters and engravers whose activities preceded the arrival of the Oleys et al. because they were finishing blades forged by Bertram as early as 1670 and their subsequent hardware enterprises survived well beyond the end of sword-making, as shown in the bottom photo.

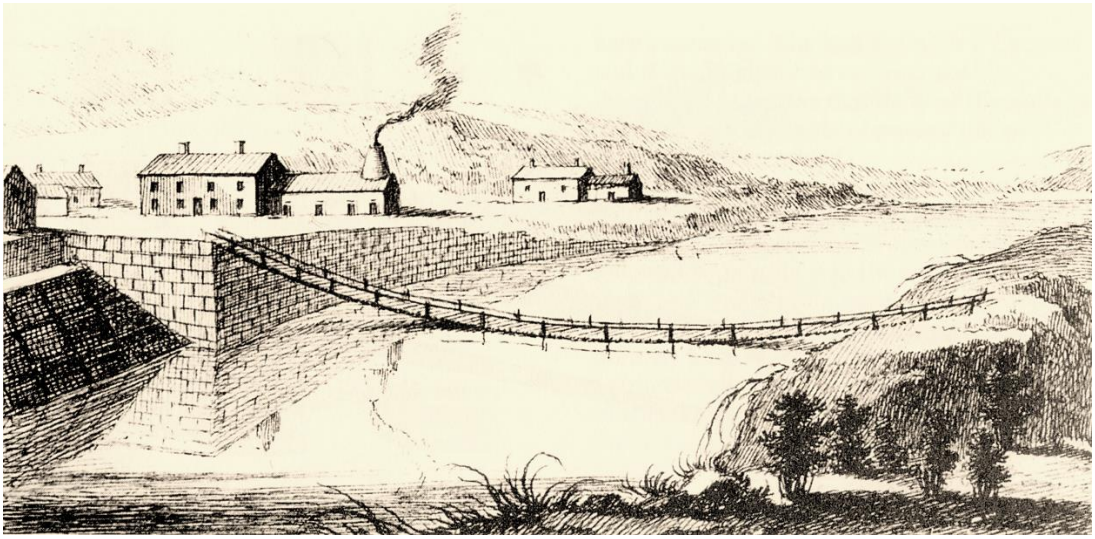
Below: Undated, but the Shotley Bridge Wilsons are still going strong.

Below (left) is a photo of Wood Street in the mid.1950s; plus another (right) of Mrs. Urwin and Mrs. Murray, residents of the last houses left standing (Nos.13&14). Both these images were taken by local amateur photographer George Clarkson and supplied by his son John to Andrew Thompson of the Village Trust Society; thank-you Andrew and John.

Below: the 'Venture' coach leaving Shotley Bridge at the end of the 1950s on one of its regular trips to Blanchland. The Whip [driver] is Mr Lewis Priestman of Derwent Lodge, a colliery owner who operated his coach three times a week in the season. The passengers had booked a seat or were invited friends of Mr Priestman. The guard, Will Payne, is standing on a step in his full livery, having just helped to put on the cock horse for the stiff pull up to Mere Burn crossroads. The postilion riding near the cock horse is Matt Elliott. The school-boy walking alongside is my collaborator Peter Hudson.

Mills, Furnaces and Forges

Below is Bertram's Blackhall forge mid.1700s (Sketched by Angerstein):



left: Derwentcote Forge (extant) right: Blackhall Forge (demolished)

Below: Derwentcote refurbished and Bertram's *Old-Forge* cottage rebuilt.

Coal and clay-band ironstone could be found around the Derwent Valley and its presence will not have gone unnoticed by Hoechstetter; he found the lead, I'm sure he found the ironstone.

There *was* coal nearby – but charcoal was used for ironworking until Queen Elizabeth attempted to prohibit the wholesale destruction of our forests for use as charcoal. The ratio of trees to iron output is disastrous: a mid-sized blast-furnace used 13,000 acres of forest to refine 500 tons of bar iron.

Allensford: active from c.1600 and probably earlier. In 1670, William Bertram was operating a blast-furnace and a forge there to produce pig-iron and steel; this was the only charcoal-fired blast-furnace in the region. Chopwell Woods couldn't have lost a few trees without anyone noticing, particularly the landlord Sir William Middleton, Baronet of Belsay.

Denis Hayford seems to have been a deviously ubiquitous figure in the area during this period, and by 1692 he had taken the lease on Allensford until 1713 when it was conveyed to Nicholas Fenwick of Newcastle. At some point the lease was with Sir Ambrose Crowley and was producing a capacity of 130 tons p/a. By 1736 it was out of production.

Next we see **Blackhall Mill** furnace, financed by Heyford and his Yorkshire and Derbyshire partners; developed and run by William Bertram in 1719. It was supplying the swordmakers et al. with their steel, and was the source of Bertram's famous Shear Steel, making him a lot of money: £225 per annum.

Derwentcote comes next and the fact that it is still in almost perfect existence makes it unique in this country. Now this was (as far as records can precisely indicate) initially a 'Finery Forge' owned c.1718 by two inconsequential Newcastle merchants who purchased 'forge plates' from Heyford. There is no written indication of who was running it then, but it will almost certainly have been a Bertram or a Vinton, probably both.

In 1733, a new partnership, that included Leaton-Blenkinsop, financed the construction of the steel furnace at Derwentcote, but the partnership did not last. The Bertrams and Vintons built that and were running it.

The Crowley Iron Works. Sir Ambrose Crowley appeared down at Winlaton in 1691 (thanks, in part, to his friendship with George Bowes) and was vital to the long-term industrial future of the valley; his eventual metalworking complex became Europe's biggest industrial location.

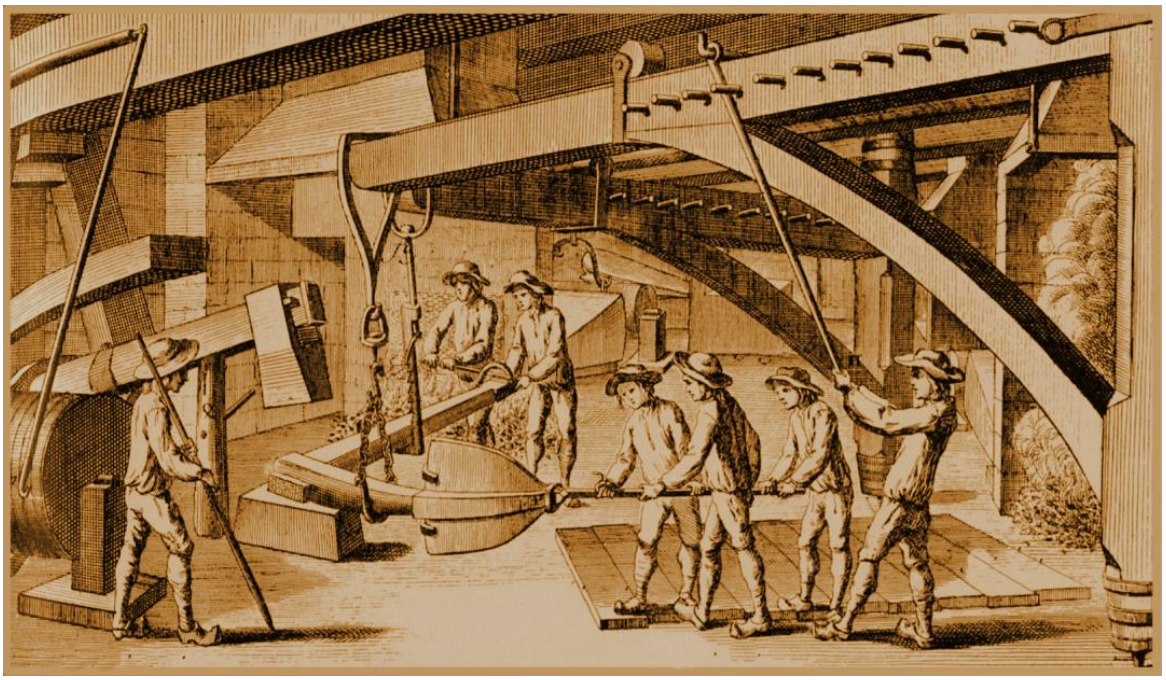
He is renowned for his Quaker management methods. Workers had an elected works committee, sickness payments and company medical team; the staff were treated with profound respect. The rules are set out in a book called the 'Rules of the Crowley Iron'.

In 1707 Sir Ambrose Crowley acquired a small ironworks in Swalwell where he subsequently developed a large complex of workshops and associated facilities. His Swalwell enterprise was primarily a finishing plant for the manufacture of nails, anchors, saltpans and hoes and as such did not have the historic significance of Winlaton Ironworks.

In 1718, Swalwell works include dams and floodgates, blade mill, corn mill, steel furnaces, anvil shop, file cutters and forger's shop, warehouse, office, hardening shop, rod-iron warehouse, bar-iron warehouse, slitting mill, bellows etc. In 1728 there were 157 workers at Swalwell.

The Swalwell works used Derwent River power to drive the bellows, hammers and rollers. Pig iron was converted into bar iron. Iron plates were made - possibly for salt pans. A limited amount of foundry work took place at Swalwell - pig and scrap iron melted in reverberator furnaces to produce smoothing irons, door-knockers, wheel hubs, hammers and the cast-iron cannon which the firm started making briefly in the mid.18th century. By this time the production of steel (thanks to Bertram) was a Crowley speciality and there were two steel furnaces at Swalwell. The slogan of the company was "…anything from a needle to an anchor…!"

The earliest record of chain-making (a product which required a special technique) appears to be in 1765 when the Swalwell forge was already making the heavy anchor chains for which the firm became famous. Some chains were made from links up to 3 feet in diameter weighing 250 lb.



Eventually, around 1850, the works was sold to a Mr. Laycock, *who tossed all of the Crowley's business records into a furnace;* perhaps to hide details of the slave-trade profits. Messrs Ridley & Co. subsequently acquired the works and light engineering continued at Swalwell into the 1960s. Above is the Ridley Steelworks in 1963, these were Crowley's buildings, the last gasp of his monumental achievement.

The Derwent Iron Works were established in 1840. The works were the largest in England, with eleven blast furnaces on a site of over 70 acres, and a workforce of nearly 4,000 men and boys. Despite its scale, the company was notoriously unprofitable.

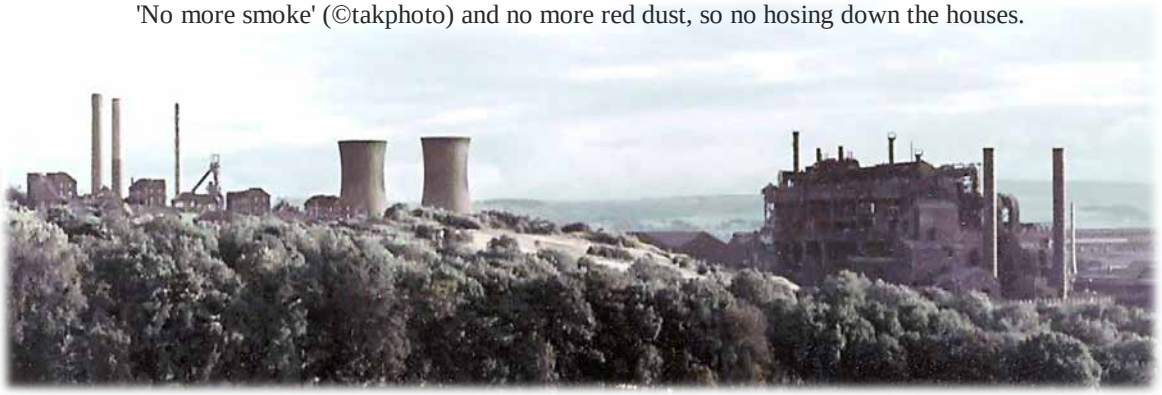
The works were acquired by the newly-formed Consett Iron Company controlled by John Henderson and two Quakers, Joseph Whitwell Pease and David Dale. The company had 18 blast furnaces, only seven of which were in use. They employed 4,000 to 5,000 men in 1865.

William Jenkins was appointed general manager from 1869. Jenkins was largely credited with the turnaround of the Consett works. A political Liberal and a staunch churchgoer, Jenkins was a humane and kind man who generally retained his workforce during slack trading periods. He had a keen commercial mind and was a strong judge of character.

45,000 tons of iron was produced in 1869. They operated the largest iron plate works in the world and by 1880 manufactured 1,600 tons of iron plate every week; 132,000 tons of iron and steel were produced in 1890. By 1894 The Consett Iron Co was the largest steel manufacturer in the world and was remarkably profitable, a testament to its strong management.

It was nationalised in 1967 and became a part of British Steel, then was closed due to industry overcapacity in 1981 with a loss of nearly 4,000 jobs.

'No more smoke' (©takphoto) and no more red dust, so no hosing down the houses.



Odds and Ends

Final words.

During the years spent researching this story there have been occasional interesting trifles surface that do not demand entry within the narrative:

1630s: Benjamin Stone (Hounslow) stated that Birmingham was producing poor quality blades. Joseph Jenkes was working with him. See page 135 to discover Jenkes' eventual connection with the Vintons in America.

1719: Henrick Kalmeter (Swedish spy), visiting Shotley Bridge, reported that production was down to 4,500 blades p.a. out of a potential 21,000.

1754: according to a report by R.R.Angerstein (another Swedish spy), Bertram himself was earning £225 p.a. from the Blackhall Mill; enough to buy 36 horses, or 53 cows back then.

Hotel: I have become convinced that, contrary to local lore, there was never a pub called *The Commercial Inn*; that it was a description – not a name: The Crossed Swords - a commercial inn. Newspaper cuttings and images of the early signs corroborate this, although contention obviously endures.

1800s: a priest-hole was found at the Yorkshire hall of an important Catholic family. It contained a large quantity of swords marked Shotley, plus pistols, saddlery and harness – enough to arm and equip a 'troop of horse'. Believed stored after the 1715, but unused during the '45, the weapons were distributed to local militia during the Napoleonic invasion scare. After the peace celebrations were over, no swords or pistols were returned by the yeomen; most were reported lost during the weeks of drunken festivities.

Here is an extract from a review of the village and Spa Hotel in the Newcastle Guardian and Tyne Mercury, 1846, that states:

> *"…Last, not least–if the Spa Hotel be adopted as his domicile– the visitor can have the highest honour, in Mrs Williams, his hostess, of being the guest of an "Oley." This family, it will be remembered, originally German, had settled here some time in the 17th century, as broad-sword manufacturers,–and during the rebellion were captured, first by one party, and then another, and made to supply the implements of warfare to the belligerents*" (sic)

Solingen: can trace its superior metalworking heritage back 2,000 years.

Solingen Method: Each guild specialized in one part of the sword making process, e.g. the forging of blades, grinding, hardening, and finishing. Each process was strictly separated and executed by different persons with no person performing more than one job. These persons specialized in their fields and became experts, which led to an extraordinarily high level of blade and sword quality. Their knowledge was passed down from generation to generation and not shared with anyone outside of their particular guild.

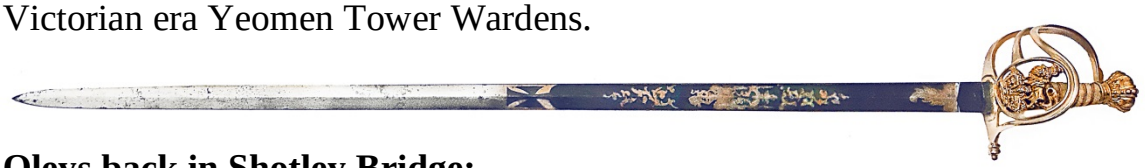
1830-3: seen in Birmingham, a 'blade roll-forge' (sic) for which Mr. Fritz Weyersberg (of WKC) purchased the patent; the forge was subsequently established in Solingen. With this machine, *which still exists at WKC*, they were able to forge multiple blades in a short space in time.

1890: Rudolph Kirschbaum (of WKC) joined the Wilkinson Sword Company, an association which lasted until 1914.

Remscheid: was twinned with Ashington and Newbiggin in 1952.

Solingen: is twinned with Cramlington: once home of Wilkinson Swords.

Robert Mole and Sons: were finally absorbed by Wilkinson Sword in 1920, but not before they had produced hundreds of thousands of swords and bayonets of every description. I wanted an example to close the chapter on their endeavours, but did not want to use a one of the thousands of blades produced for general militia; I finally came across this sword from the Victorian era Yeomen Tower Wardens.



Oleys back in Shotley Bridge:

…at The Crown & Crossed Swords Hotel, Shotley Bridge, 2023.

20 plus members of the Oley family from Birmingham and across the UK gathered to discover their sword-making heritage in the place where it all began more than 300 years ago. My collaborator and lifelong local resident Paul Heatherington volunteered to guide them around the village and all attendant pertinent locations.

I was asked to join them in the evening and tell their story. It seemed like a fitting end to my efforts. They were delighted. I felt honoured. They had these polo-shirts made to wear during the event. Paul and I both received one.

Bertrams: get the final word because, although they came after the Vintons at the beginning, they certainly endured to the very end of this blade forging saga. Around 1865, because of a marital association with the Solingen poultry industry, Carl Bertram adopted the now famous Hen & Rooster logo to mark his output. This family-run manufacturing facility has produced what is considered to be "*The World's Finest Cutlery Since 1845"*.
The company continued manufacturing for one hundred and fifty years under the leadership of successive family members.

They were also renowned in both Solingen and Sheffield for their straight razors, and received a royal warrant from Queen Victoria… see below:

Their products were of the highest quality with exceptional attention to detail in their knife work that continued to impress collectors the world over.

(above) A National Knife Collectors Association 'Club Edition'.

I know the Vintons were there first, but they were part of the Mines Royal enterprise and had a royal warrant; Bertram was just one man, making his way in the world, and establishing the beginning of the British steel industry; finally, cutlery that was still world famous in the 1990s!

ADDENDA

Company of Cutlers

A brief essay extracted and paraphrased from The Mark of the Sword *by* Tom Girtin.

It was a many-sided business, defined as the making of 'swords, daggers, rapiers, hangers, wood-knives, pen-knives, razors, surgeons' instruments, skeynes, hilts, pommels, battle-axes, halberds, etc....' but it was not so straightforward as that. There were, in fact, several different crafts involved in the manufacture of cutlery, some of them, in the early days, having their own organizations and ordinances and lines of demarcation: the Bladesmith, or Knifesmith, made the blades, the Hafter made the handles, and the Sheathers the scabbards or sheaths. It was the trade of the Cutler to put the various parts together and to sell them. The Hafter was the artist among the craftsmen, particularly in the days when the hilts of swords and daggers and the handles of knives might be made of ivory, of gold or of silver, and embellished with precious stones. Yet, although Hafters were clearly a highly-skilled and important class of workman, they were never a Mistery independent of the Cutlers' Company.

The Sheathers, on the other hand, were a more numerous body who at one time had a separate organization and ranked as one of the misteries of the City. Most important of all were the bladesmiths: they began by being a separate Mistery from the Cutlers and long remained so. Subdivided into Swordsmiths and Knifesmiths, the majority of the latter seem to have come under the control of the cutlers while the Swordsmiths continued under the rule of the Bladesmiths.

There were, in addition, two subsidiary trades which from time to time were of concern to the Cutlers' Company. The Furbours' craft consisted in refurbishing and repairing old weapons and armour; their Mistery was common to both armourers and cutlers. The Grinders - perhaps the lowliest of all the trades involved with cutlery - were also concerned with the Shearmen and the Drapers.

By 1630, the making of swords and rapiers had become the chief preoccupation of the Company. In 1631, a commission had been granted by the Crown to the Armourers and Gunmakers, to the Bandolier Men and the Pikemen, for the making of armours, guns, bandoliers and pikes for all the trained bands (militia) of England and Wales.

There had been no mention of the making of swords or rapiers or any of the other weapons which had always been made by the Cutlers. Robert South 'the King's Cutler' and a member of the Company, suggested that the Cutlers should declare their interest in fulfilling part of the commission. A petition was entered to the appropriate Committees and their action was successful.

There were, at the same time as they prepared to set to work on their share of the great scheme for arming of the trained bands, the usual petty distractions. These were 'Brokers' and 'Hawkers' and Birmingham men indulging in their usual 'sinister dealings and deceits'; but the chief obstacle in the way of their rearmament program was the opposition that came from a Liveryman: Benjamin Stone who, while London based, owned a blade grinding and finishing factory at Hounslow.

Benjamin Stone

The story of Benjamin Stone has been recounted on a few occasions but bears repeating here. A London man, he took advantage of the import of German swordmakers into Hounslow at the King's command in 1629 and established a grinding mill using said workers and it wasn't long before he was outputting thousands of high quality blades. Unfortunately for some, he bypassed the Cutlers Company and approached the Ordnance Board directly, declaring the far superior standard of his blades compared to the English products, plus *the equivalent quality but a better price than the import agents were charging*. He promised swords complete with hilts, scabbards, hangers and belts.

However, the influence of the Cutler Company blocked his success despite the King ordering Stone be made a member of the Ordnance Board, as they had been given an order for four thousand swords. The Council demanded that those swords supplied by the Company be tested in their presence at The Tower armoury; the Guild didn't turn up.

Stone had spent £8,000 on blade production and offered 1,000 swords a month. He also insisted on having the power to prevent the miss-marking of blades from the Cutlers with fake Toledo marks. He could also fight dirty if needed. His application to supply the Tower was accepted, the decision of the State being that they would buy as many swords as Stone could supply; he was by then calling himself 'The King's Bladesmith'.

In July of 1631 he delivered 4,356 hilted swords to the Tower with basket hilts at a cost of 6 shillings each. Later that year he received a royal patent from the King:

A special priviledge granted to Benjamin Stone,
sword blade maker, and his assignees, for the term of
14 years next ensuing (starting at Michaelmas)
within England, Ireland, and Wales, to make and work
all manner of sword blades, fauchions, skeynes, rapyer blades
and blasts (blade poles) serving for rests of muskets,
of any fashion or kind whatsoever, according to a way or invention,
by him devised, by the help of mill or mills,
and the same to sell at moderate rates of diver form & fashion,
paying therefore 40 shillings yearly to the crown,
amount during the said term, with the ordinary proviso
for making this grant void in case it shall be found to be
contrary to law and inconvient to the state.

When the civil war began Stone relocated to Oxford to serve the King; Cromwell then commandeered some of the Hounslow mills and converted them to powder mills. Along with Stone there were various German smiths in Oxford e.g. Peter Munsten (the younger) and Heinrich Hoppie (senior). Two others were Heinrich Hoppie (the younger) and Peter Henekells, who returned to Hounslow then left with Dell for Shotley Bridge in 1685. Stone was in Oxford until 1649 and never returned to Hounslow. Munsten became an arms furbisher for the Tower in 1689.

Heinrich Hoppie (senior) & Peter Munsten

It has been stated by various chroniclers that Hoppie, and Munsten (who changed his name to Peter English) – in an attempt to return to work at their mills in Hounslow – had petitioned the Crown and the Cutlers Guild but were rejected by both: this is not the case. As early as 1674, the King had declared that England should once again have its own sword manufactory; the Cutlers Guild had concurrently approached the Master of the King's Great Ordnance of the Tower with a view to establishing a manufactory, and had also approached Munsten and Hoppie seeking their involvement.

Despite such favourable beginnings, nothing came of it; here was one of those schemes that simply did not come to fruition. Hoppie and Munsten subsequently sent this petition directly to the King, and yet again it was without result.

"In 1629 they were brought over to England by William Heyden and the late King and set up their manufacturies at Hounslow; that in the wars they followed his majesty to Oxford, for which Cromwell took their mills from them and converted them into powder mills; that they only remain who know the Art and foreign workmen are hard to obtain, as they are obliged to swear, on leaving the trade not to discover it on the pain of death; that his majesty ordered the late Colonel to see them provided for, which he doubtless would have done had he lived; and that his majesty desire of setting up the said manufacture in England may be performed by the instructions of the said Hoppie and Munsten, if they receive his majesty's encouragement."

We now know that the Crown developed other plans for an English sword manufactory – out of reach of the City of London, the Cutler's Guild and Parliament. Also, at that time, import agents had brought in huge quantities of very low priced blades which had saturated the market; nothing new there then.

Above: A selection of Hounslow made swords (not to scale).

Below: Tower of Hounslow Powder Mill and Watermill (tinting by author).

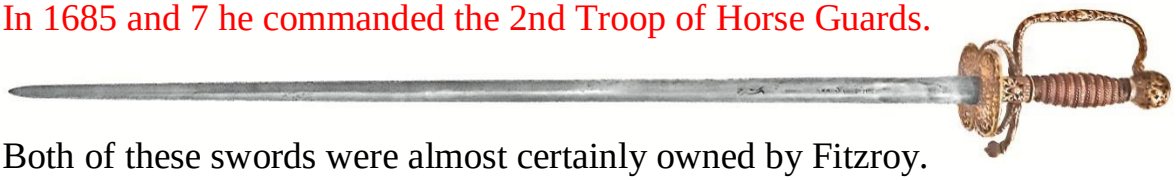
Black Gate sword & Smallsword: provenance

Featured on the front cover and inside of David Richardson's book.
A Household Cavalry officer's sword from the 2nd Troop of Horse Guards.
SHOTLEY and a Passau wolf to one side; BRIDG and a wolf to the reverse.
Both sides of each guard are adorned in relief with a crowned leaf mask or 'Green Man' composed of oak leaves with pendant acorn, flanked by a lion and a unicorn and supported by winged and robed figures.

The Lion and Unicorn are the supporters of the Royal Arms which is the badge of the Life Guards (once the Horse Guards, and Queen's Horse Guards). The figures on the hilt match the angels which appear to this day on the trumpet banners of the Life Guards. These belonged particularly to the 2nd Troop in the 17thc. when they bore The King's Cipher: 'sustained by two angels of silver, that on the right having a sword in his hand and that on the left a palm branch'. These figures also appeared on the standard, guidon and the drum banner of the 2nd Troop.

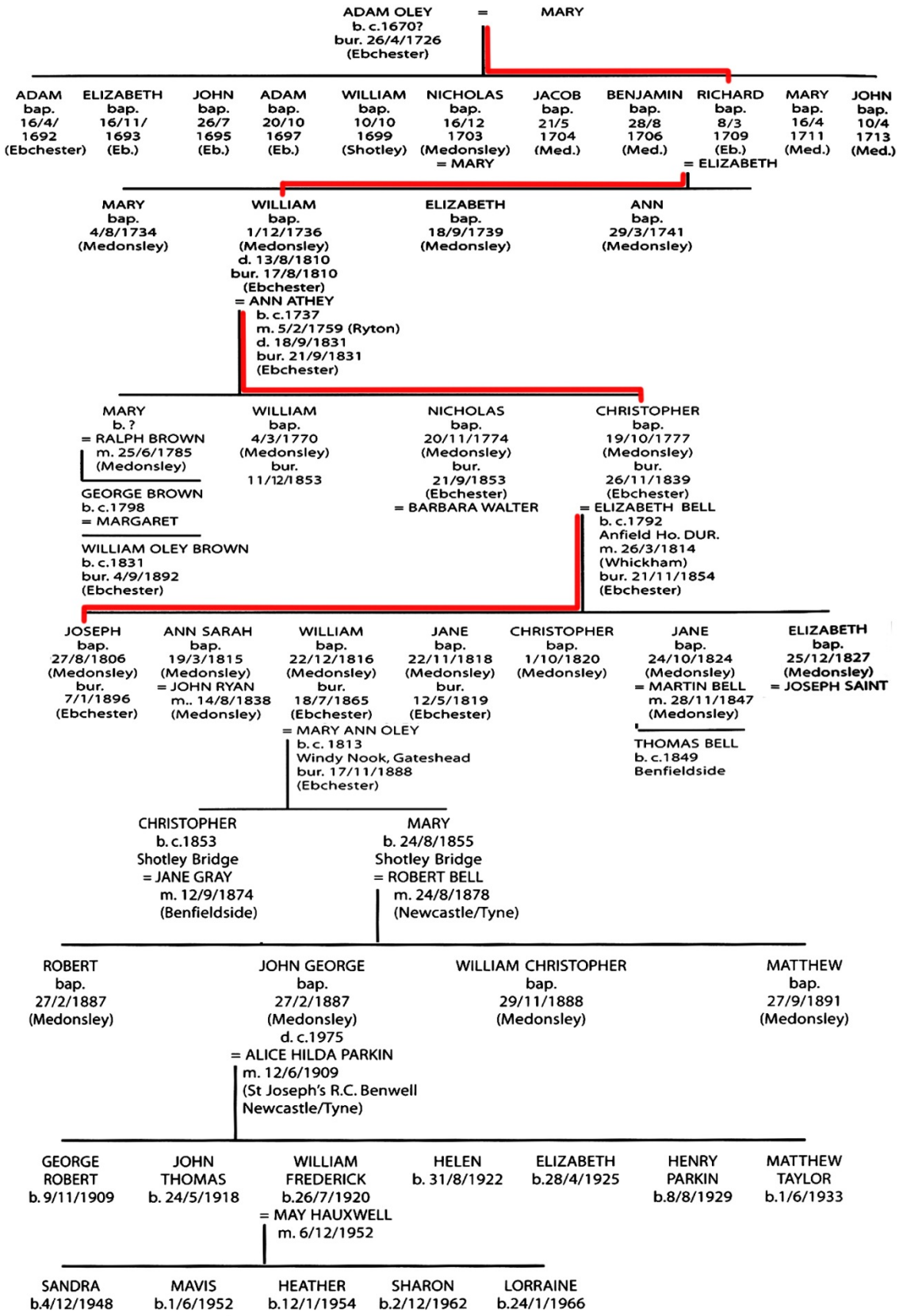
Lieutenant-General George FitzRoy (1665–1716)

1st Duke of Northumberland, KG. PC. was the third and youngest illegitimate son of King Charles II by Barbara Villiers, Countess of Castlemaine.
He was the fifth of the king's eight illegitimate sons.
In 1674 he was created Earl of Northumberland, Baron of Pontefract and Viscount Falmouth.
In 1683 he was created Duke of Northumberland.
In 1684 he was installed Knight of the Garter.
In 1685 and 7 he commanded the 2nd Troop of Horse Guards.



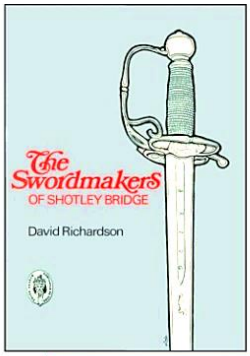
Both of these swords were almost certainly owned by Fitzroy.

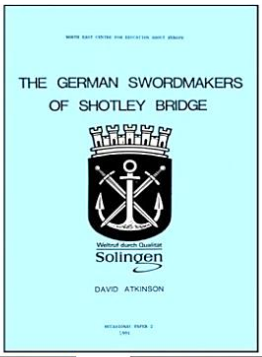
The Shotley Bridge Oley/Bell family tree.

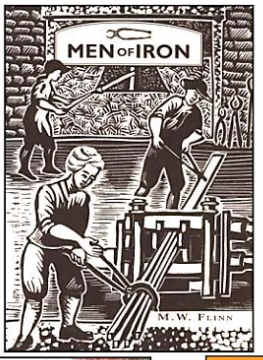


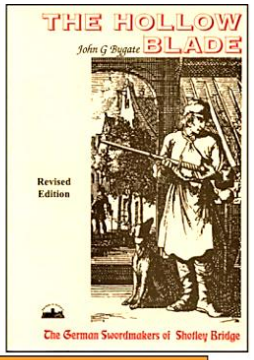
Reference books

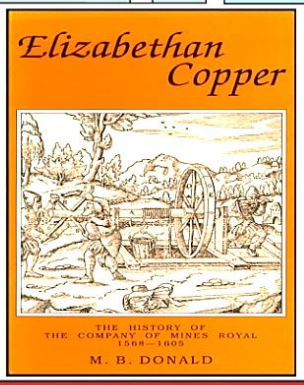
Here are important books associated with this story: every one of them has something to add, some more than others. Dougie Vernon parenthesises the story of Shotley Bridge within a history of the southern Derwent Valley's iron and steel industry; not only is this the latest publication, but he was right on site most of his life, so definite advantages there. Angerstein devotes a few hundred words and some fine sketches, but he wrote them in-situ in 1754, so he has an equally relevant advantage. David Richardson's 1973 labour of love is crammed full of detail, but also some conjecture because of a lack of 'primary source' evidence (Dougie Vernon's apposite terms); even so, for a long time, all agreed it was the definitive work.

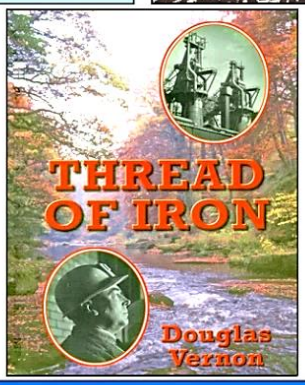


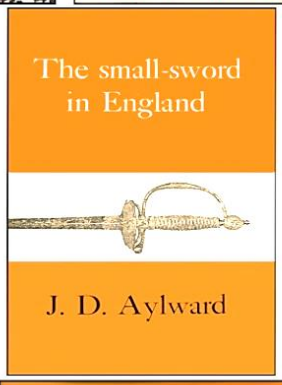


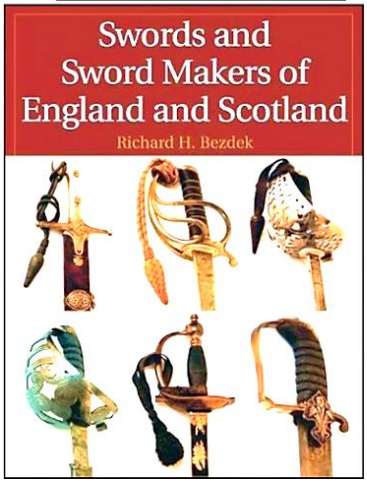


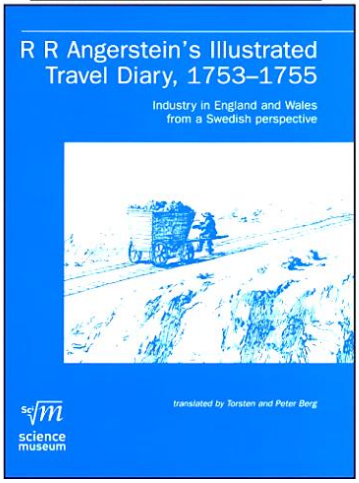


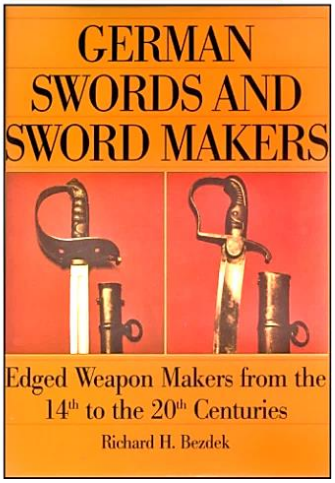












Reinhold Rucker Angerstein

The Travel Diaries 1753 to 1755.

While studying the history of the Shotley Bridge swordmakers, references are constantly made by researchers to the travel diaries of R.R. Angerstein. The Jernkontorer (or Swedish Steel Producers' Association) were always keen to know about the practices and achievements of their European neighbours who were often not only their competition but very often were also consummate consumers of Swedish iron.

At least two Swedish engineers are known to have visited the Derwent Valley, in 1719/20 Henrik Kalmeter (Auscultator in the Board of Mines), then later-on, and more importantly, R.R. Angerstein. We have a complete translation of Angerstein's travel diaries in England and Wales and, consequently, a detailed understanding in text and sketch of everything that was happening within our national industries at that time. When access was permitted, Angerstein went everywhere to view and record everything in extremely fine detail. The following gives a local and pertinent example of just how thorough he was, and how much his reports have contributed to the understanding of our early industries.

On Tyneside, he recorded all the ironmongers in Newcastle and how much ore they were consuming, visited and sketched a sugar factory and a string factory, visited silver extraction reverbatory furnaces, and Mr Hall's cementation furnaces, both outside the town walls, then went on to the coal staithes at Dunston. His notes on the movement of coals from the mines included every aspect of early rail carriage, right down to axel diameters, wheel construction, and (see following image) control of heavy loads down steep slopes.

No detail escaped his attention; it was industrial espionage on an unprecedented scale. He was ostensibly interested in understanding how Sweden might advantage their bar-iron sales, but he was also spying on industrial developments – especially the manufacture of steel, the practice of which was primarily a product of German immigrants such as Bertram in Shotley Bridge, some of whose output sold to Sheffield. As the Bertram dynasty had consistently married Swedish women, Angerstein was given a warm welcome to their home and forges.

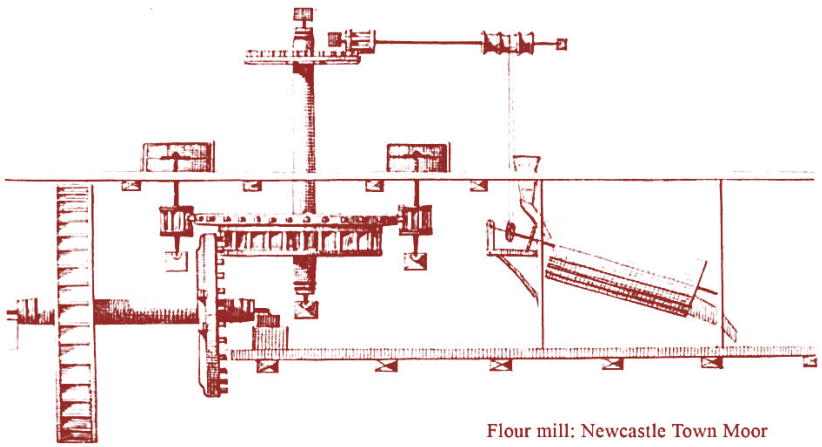
But before he arrived in Shotley Bridge he visited the Crowley works in Teams and Swalwell, where he recorded every last detail, including ore consumption, costs, numbers of hearths, numbers of workers and their wages, and most importantly, all the products and their destinations.

His research also included coal mines, with details of the seams, their depths and thicknesses, and the general geology of the Tyneside area.

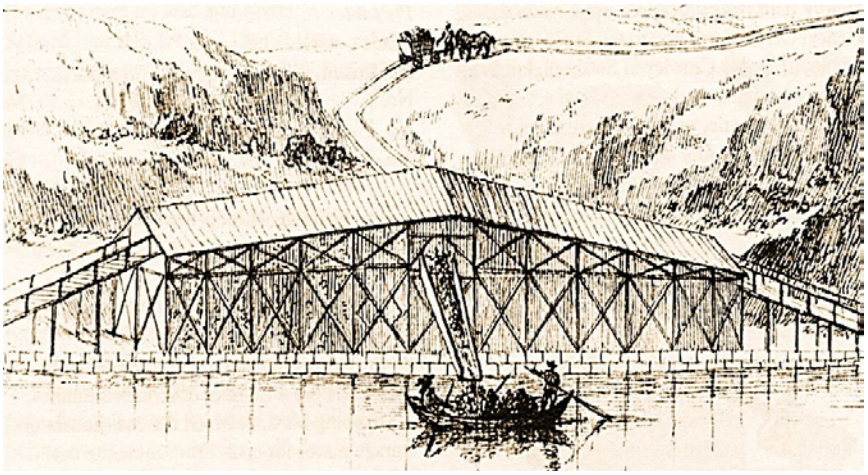
Then on to Shotley Bridge where, thanks to him, we have a diagram of *one* of the infamous, secret machines, much discussed, often derided and denied, but very much in existence.

(*Of course, this machine was in the grinding house and was no longer top-secret; the other machine was in Oley's forge and no-one got in there, not Angerstein, not even other German workers on site.*)

Drawing on Angerstein's writings offers unrivalled details of all the industries active on Tyneside in the mid.1700s. Some of those not mentioned above are woollen mills, potato farms, and obviously ship-building, although, of that, what he recorded was the intriguing sight of a marine timber pre-fabrication establishment out in the Tyne Valley countryside while on his way to Carlisle.



Flour mill: Newcastle Town Moor



Elizabethan Copper

Ingenious Artisans:

This is an extract from the history of the Hoechstetter adventures in bringing mining and refining expertise to England in 1568:

… In a statement drawn up by the Duke of Suffolk in 1563 to examine the position, it is emphasized that these foreign developments in mining had more in them than the production of metals, since the foreign Princes:

' ... had so many labourers in the mines, so bold, so nimble to all purposes to deliver that if any question of war should serve, no like soldiers nor like number could be had in readiness to withstand their enemies.

Those kings' revenues were so enlarged to the third penny they had before, that thereby their riches became a terror to such as meant any wars towards them. Besides that all the poor folk in their countries were set awork and none left idle. Rude and ignorant men were made expert and full of knowledge, not only in the art of minerals (which is most honourable) but in all kinds of waterworks, as in the draining of waters and such like, to this our country most necessary considering our marshy and fenny country now already drowned and covered with water.

And thereby likewise was made and proved a marvellous company of cunning pioneers, iron smiths, copper smiths in all kinds of work very skilful to melt and work any kind of metal, to the proportion and frame of any instrument, to serve in war to the hurt of their enemies. And besides all those by this was had a perpetual trial and staple there to cause repair of all other strangers to bring such commodities thither, as their countries did yield, in exchange for such kind of metals as they by the said minerals and by their policy had far worked and set from the bowels of the earth, as no person before that at any time would, which otherwise might have remained hid and so not to serve to any use or purpose .... '

Henry VIII had tried his best to develop such mining, but was forced to admit defeat on account of the ignorance of his technical personnel. The Duke of Suffolk

' ... was informed also to proceed no further in his devices, partly belike occasioned of unskilfulness in his labourers, the cunning of such kind of work being then not thoroughly known, partly also for want of convenient sums of money.

(Research courtesy of M.B. Donald *Elizabethan Copper* 1955)

****

Hoechstetter, Northumberland & The Mines Royal

The Höchstetters were descendants of Staufer ministerials from Höchstädt an der Donau; the first documentary mentions come from the end of the 13th century. Under Ulrich V the family rose to the wholesale and long-distance trade in textiles and spices. After Ambrosius the Elder founded a trading post in Antwerp in 1486, the Höchstetters, along with the Fugger and Welser families, were among the most powerful German merchant families. At the beginning of the 16th century they owned a large trading and banking house in Augsburg with branches in Antwerp, Bruges, Venice (Fondaco dei Tedeschi), Lisbon and Lyon and were, among other things, *owners of the Steineberg ironworks in Tyrol*. In 1512, Ambrosius the Elder bought the village of Ettenhofen and built a moated castle there. In 1518 the family was raised to the rank of imperial nobility and called themselves Höchstetter von Burgwalden. In 1529 bankruptcy put an end to the trading house.

Author for "The Wild Peak" Blog: Stephen Lewis

On 10 December 1564, an indenture was made by the Queen on one part, and Thomas Thurland and Daniel Hoechstetter on the other, by which these two were empowered to search, dig, try, roast, and melt all manner of mines and “ures” of gold, silver, copper, and quicksilver, in the counties of York, Lancaster, Cumberland, Westmorland, Cornwall, Devon, Gloucester, and Worcester, and in Wales. The Queen was to have one-tenth of native gold and silver, and one-tenth of gold and silver ore holding 8 lbs. weight in the cwt.; of every cwt. of copper, 2s., or one-twentieth during the first five years, and afterwards 2s. 6d. or one-fifteenth; “and too have the preferment in bying of all Pretious stones or pearls to be found in the woorking of these mines”; also rights over tin and lead.
Daniel Hoechstetter was acting as agent for David Haug, Hans Langnauer & Co., of Augsburg.

They were, writes W.G. Collingwood in his Elizabethan Keswick, Extracts from the Original Account Books, 1564-1577, of the German Miners in the Archives of Augsburg (1912), 'already great dealers in silks, cloths, and draperies, in groceries and the spices of the East Indies, and like other wealthy business men of the time, in banking and bill discounting. They had widespread branches, reaching from Venice to Antwerp and from Cracow to Lyons; and though not originally interested in mines, they had recently taken over from the successor of the famous Augsburg house of the Fuggers the control of the copper mines of Neusohl in Northern Hungary. One of their branches was at Schwatz, in Tyrol, near Innsbruck, a celebrated mining centre, where silver, copper, and iron were produced ; and we find... that it was from Schwatz that some of the first miners were sent by them to England'.

German surveyors and mining experts arrived in Cumberland and soon started to find sites where they believed the mining of copper, gold, silver and lead could profitably be started. German managers continually informed Queen Elizabeth of their progress. In April 1565 Hoechstetter had invented a new engine for draining mines, patented in 1568, and he applied for the "privilege of waterworks", offering to form a company and allot shares. The Queen 'excused the Company from royalties until work should be established'. And after silver was found in copper ore she 'gave leave to fell timer in her woods' and to 'apprehend disorderly persons employed by them'.

In August 1566, a very rich mine was discovered at Newlands, later to be called the Goldscope mine. Thomas Percy, the earl of Northumberland and lord of the local manor, stopped the Germans working by force but only after 600,000 lbs. of ore had been raised. In October Hoechstetter wrote that the Germans had been 'ill-treated by the English workmen'.

'He said that Leonard Stoultz had been murdered by one Fisher and his accomplices.' This information was passed to the Queen, who, ever desirous to gain a profit from the venture, wrote to Lord Scrope, the Lord Warden of the Western Marches, and to the Justices of the Peace of Westmorland and Cumberland, 'bidding them repress the assaults, murders, and outrages on the Almain (German) miners lately come there for the purpose of searching for and working minerals'.
Early the next year William Cecil, Elizabeth's chief adviser and Secretary of State, together with the earls of Pembroke and Leicester wrote to the earl of Northumberland 'requiring him to allow Thurland and Hoechstetter, or their assigns, to carry away ore dug at Newlands'. The Queen herself also commanded Northumberland to 'offer no further obstruction to the miners at Newlands', and that 'any lawful claim he may have in the minerals shall be reserved to him'. But the earl thought that any minerals found at Newlands belonged to him. He had, he wrote to the Queen 'ascertained beyond doubt that the minerals dug at Newlands belong to him only, and that the workers are trespassing on his land'. He requested the Queen, the Lord Treasurer, Sir Walter Mildmay, Lord Chief Baron, and other Barons of the Exchequer, 'that the injunction respecting the ore dug on his land at Newlands may be dissolved'. The stand-off dragged on and it was important who won because Northumberland's opposition to Queen Elizabeth wasn't just about religion, it was about money as well! In September of 1567 Thurland could write to the Queen that they 'had at length attained to the making of fine and perfect copper'. He sent a specimen. He added that 'they only want workmen' and that 'they desire a conclusion between the Queen and Northumberland'. Collingwood commented wryly on the Earl of Northumberland's rebellion: 'Next year Northumberland led the hasty and fatal Rising of the North, and escaped only into prison in Scotland.

But it is interesting to observe that while he was plotting against Queen Elizabeth, and planning to put Queen Mary on the throne, he was letting his woods on Derwentwater to the Royal Company for their building purposes and selling them charcoal.'

On May 25th 1568, the Charter for the Governors, Assistants, and Commonalty of the Mines Royal was signed; authorizing the election of two governors, four deputy-governors, and six assistants… In October 1568, the Earl wrote to William Cecil requesting 'a final answer whether he is to have a reasonable composition for the mines or not; otherwise he must assert his right and title to them'. The argument was finally and definitively settled when: 'The matter went before all the judges and the barons of the Exchequer. It was decided by a majority that as there was more gold and silver in these mines than copper and lead the Queen was within her rights in claiming them ; and this remained the leading case regarding Royal rights in mines until the time of William III.'

All this palaver had not stopped the Germans from continuing their work: digging the mines and building smelters at Keswick. The ore from Newlands was carried over to the shores of Lake Derwentwater and then transferred by boat to Keswick. Pretty soon nearly a dozen mines had been dug in the area; at, for example, Borrowdale, Stonycroft, Fornside, Grasmere, Newlands, Minersputt, and Buttermere. Keswick itself became the smelting centre. 'The woodlands in the area were decimated to provide charcoal, needed for fuel in the smelting process.' With a great deal of belief in the benefits of 'progress', a later writer wrote: 'Although the valleys were denuded of trees… prosperity was brought to many whose previous existence had been limited to scraping a living from fell farming or simple rural trades'; a debatable view at best.

Ian Tyler writes: 'In 1569, the acquisition of Derwent Island by the Company of Mines Royal provided the miners with somewhere safe to live and form a community.

At 250 yards long and 170 wide, the island soon became a veritable German colony, with its own bakery, pigsty, windmill and orchard. Evidence is too scanty to prove that the miners moved to the island because of hostility from local people.'

Most of the mining and smelting work was undertaken by the skilled Germans, although Englishmen were later employed as well. In general the English were used as fetchers and 'carriers'. The surviving Augsburg account books of the Company, translated and edited by Collingwood, list all the payments made for such things as carpentry, wood and boards, smithy and iron, tallow, charcoal, stone coal, building, sacking and the carriage of peat and many more necessary industrial supplies. The names of the English (and German) workmen and carriers are listed as well. There are dozens of local English names, a veritable catalogue of local Cumberland families in the sixteenth century. Just one of these families (and not the most important) were the Grisdales of Matterdale.

Once the mines and the smelters were fully up and running in 1569, we find a certain John Grysdall mentioned twice. In the August 1569 accounts – the Germans did accounts seven times a year- John is listed as a 'peat carrier'. He received payment for delivering 3 hundred (loads) of peat from 'Flasco' (present-day Flaska near Troutbeck in the north of Matterdale) to the copper smelter at Keswick. He did the same again later in the year. And in 1571 an Edward Gristal (Grisdale) of Threlkeld was also paid as a peat carrier for deliveries from Flasco.

In the middle of 1567 the Company began keeping its own carts and horses, for building and for carriage of special articles close to Keswick; but this did not supersede the use of English packhorses for charcoal, peat, ore, and a little later for stone-coal. Copper ore was mined and smelted at Brigham, near Keswick in Cumberland, under the auspices of the Company of Mines royal.

The sulphide ores used at Keswick were subjected to preliminary roasting to burn off excess sulphur, and then treated with nine horseloads of peat and five horseloads of ‘stone coals’ (a horseload was equivalent to 109 litres).

Limestone was added as a flux and after smelting a matte or “green stock” was run off. Subsequently, about eight days’ recovery of matte was roasted with six peat fires, each hotter than the last, to produce “copper stone” or “black copper”. This was smelted once a month to give “rough copper”, and involved three separate smelting with lead ore to extract the silver from the copper matte. This process of making copper at Keswick took eighteen weeks and five days.

Duelling & the Smallsword

Duel with Small Swords - The Graphic - February 1897

Towards the end of the seventeenth century, a very significant and important change of sword play came into fashion, and consequent on this the long weighty rapier gave way to the dress small sword with its lighter blade, grip and guard.

The Fronde in France and the Civil War in England had been conducive to much ruffianly bravery, but with a more quiescent state of affairs came a less pugnacious, though at the same time a more effeminate influence over the two nations, and the sword began to be in requisition merely as an ornamental appendage to the dress, though it was not till the reign of Queen Anne that it became what is called the "Small Sword", developing eventually into the perfect Court and duelling sword of the period of George II. and III. , and later still of the School of Angelo, upon which the modern French school of fencing is founded.

Though small and unimportant looking, there was still the necessity for making it a deadly weapon in an emergency; hence the evolution of an entirely different system of fence.

Owing to the comparative lightness of the new weapon and the much shorter blade, the attack became more rapid, the feint more intricate, and the lunge itself more involved. With the earlier forms of about 1650, it was not possible to execute the same rapid succession of parries and ripostes as are attainable with the modern duelling rapier, which is practically the same as the small sword of the latter part of the eighteenth century.

The shape of the blade varied, but the bayonet or triangular form was universal. A shape known as "Colichemarde" obtained great favour from 1730 to 1760. Here the fort of the blade was made much broader with the idea that the parry would have greater force. It had, however, the defect of throwing the weight too near the hand, allowing the point to be dangerously high and the lunge in consequence less direct.

A notable feature in all swords of this period is the very small size of the shell or protection to the hand, proving how much the science and finesse of the parry had increased, keeping pace with the lightness and delicacy of the weapon. The introduction of a larger shell in the modern French duelling rapier is due to the fact that now so much play is made to touch the hand or forearm, thereby disabling the opponent and bringing the duel to a close without fatal results. In the days of the small sword the adversary was invariably run through the body, and if death ensued the successful duellist was tried for murder, being acquitted or not according to the circumstances of the case.

Mad, Bad and Dangerous

A very interesting small-sword duel took place on January 26, I765, between Lord Byron and his neighbour Mr. Chaworth. These gentlemen were dining with others at the Star and Garter Tavern in Pall Mall about seven in the evening when the conversation turned upon the subject of game on their estates (precise story varies). This resulted in a drunken altercation, after which Lord Byron left the room, and meeting Mr. Chaworth in the passage stated that he wished to speak with him.

He then called a waiter and asked if there were any room disengaged. The waiter showed them to an unoccupied room and left them with a candle, which was all the light in the apartment except a dull fire. As Mr. Chaworth turned round after shutting the door, he perceived Lord Byron with his sword half drawn, who instantly exclaimed "Draw." Mr. Chaworth immediately complied, and at the first thrust his sword passed through Lord Byron's waistcoat, and he thought he had wounded him, when Lord Byron, shortening his sword, gave him a fatal wound. A struggle then took place between the parties, for they were found grasped in each other's arms by the landlord and waiter, who, hearing the noise, hurriedly entered the room.

A surgeon was immediately sent for, who pronounced the Chaworth wound mortal, the sword having entered on the left side of the stomach, and, passing obliquely upwards, had made its exit five or six inches higher on the left side of the back.

It appears that when Mr. Chaworth's sword passed through the waistcoat of his antagonist, he expressed his apprehension that he had seriously wounded him. Now under such an apprehension it is probable that he was thrown off his guard and Lord Byron quickly shortened his sword and ran him through.

Writhing under the agonies of his wound, Mr. Chaworth several times declared that, although he well knew that he was in immediate danger of death, he had rather be in his present situation than live under the misfortune of having killed another person. He also observed that when, after closing the door, he turned round, he perceived that Lord Byron's sword was half-drawn and knowing his man, he drew his own as quickly as he could, and had the first pass at him.

After three months incarceration the House of Lords found William, Lord Byron, "not guilty of the felony of murder, but of manslaughter," and his lordship, being a Peer and claiming the Benefit of Clergy and the statute of Edward VI., was discharged after paying his fees.

The two swords involved were preserved: at Annesley, and Newstead.

nb. *About 300 aristocrats a year died of duels in France in the 1600s.*

A Brief History of Klingenthal Swords Manufacturing By Jean Binck

Regulation French swords of the 19th century were primarily issued by two major government manufacturers: Klingenthal, in the east of France near Strasbourg (Alsace) and, later, Châtellerault in the centre of the country near Poitier. During the Napoleonic period, regulation swords were also produced by the smaller manufacturer of Versailles, near Paris, which assembled weapons with blades from Klingenthal. Swords bearing the stamp "BOUTET", Directeur Artiste from Versailles, on the hilt and are very desirable to collectors.

History of Klingenthal

At the beginning of the 18th century, King Louis XV decided to create a state-controlled sword manufacturing company in order to limit the imports of Solingen blades to France.

In 1733, the Manufacture d'Armes Blanches d' Alsace commenced operation with the help of 25 skilled workers from Solingen, Germany. The Alsace province, in East of France, was chosen for the availability of iron mines, forges and woods for charcoal, but also because the local language was similar to German.

Organization

The Manufacture de Klingenthal belonged to the government, but its general management was entrusted to a government-appointed entrepreneur. The entrepreneur operated in a purely fiscal role. His task was to buy the source material (iron ingots, charcoal etc.), pay with his own money the salaries of the workers, and organise the company in order to comply with the contracts of the government. The government then bought the finished products from him, leaving him a profit of about 20%. The plant Director controlled the production for the military contracts. He was an artillery senior officer, appointed for only a few years (2-4 usually), and helped by a staff of around four artillery officers. It was his responsibility to maintain quality control and control of speed of production etc. to fulfil the government contracts. He reported immediately to the army, and earned no more than his officer's salary.

The Revisers and Controllers were highly skilled workers in charge of the training of the other workers and the quality control of blades and swords for the military contracts. From 1808 onwards, they were considered members of the artillery corps.

There is no doubt that COULAUX was the best-known entrepreneur of Klingenthal. The Coulaux brothers applied for the job of entrepreneur in February 1801 and the family remained in charge of the management of the Manufacture de Klingenthal until the firm ceased business in 1962.

Greater Details (from: http://www.klingenthal.fr/the_manufactory.htm)

Acting upon the proposition of Monsieur d'Angerviliers, War Secretary and former Intendant of Alsace, the creation of a manufacturing facility was entrusted to Henri Anthes who operated a forge and foundry in Rothau, 40 miles away from where, ultimately, the new manufacturing site was to be located. January 1730, Henri Anthes tests his manufacturing methods with 10 specialised workers out of Solingen who will be the first ten workers at the new manufacturing plant:

Matthias Michael Schmid, Abraham Teegarten, Caspar Engels, Arnold Schmidt, Wilhelm Kind, Abraham Wundes, Andeas Aschauer, Johann Dietrich Benninghaus, Clemens Evertz, Abraham Eichhorn.

On July 15th 1730, the King grants Anthes his commission:

"for the establishment of a Royal Manufacture of Cutting Weapons in Alsace, on a 30 year lease, for the service of his royal troops".

The plant is constructed on a piece of land owned by the Great Chapter of the Cathedral of Strasbourg. The Ehn river provides the necessary power. Henri Anthes transforms an existing mill to make the first forge hammer; he builds a sharpening unit, workshops and lodgings for the workers.

As early as 1731 the manufacturing plant starts delivering weapons. The first blades bear the signature of "*Manufacture Royale d'Alsace*. Later, the facility takes on the name of Klingenthal: drawn from the blades it makes (Klingen) and its geographic location in a valley (thal).

The facility is very prosperous. New buildings are erected. Hammer and sharpening shops stretch along the river, surrounded by other workshops for forgers, temperers, founders, grinders and assembly workers together with houses for workers, inspectors and the Director himself. A village is born.

Damascus/Wootz

This reference article is mainly selected from the English Wikipedia with some checks and changes – see www.wikipedia.org for details of authors and sources – and is available under the GNU Free Documentation License.

The science and history of Wootz, and sword-blade steel, needs an entire book to itself, so I have fashioned these next chapters as a work in progress.

Damascus steel, also known as Damascened steel and sometimes watered steel, now commonly refers to two types of steel used in custom knife and sword making, pattern-weld (giving the appearance of original Damascus steel) and wootz (true Damascus, a steel of legendary sharpness and strength whose method of forging has been lost to time). Both types of Damascened steel show complex patterns on the surface which are the result of internal structural elements in the steel. These patterns are produced by the unique forging methods used for the creation of Damascened steel; skilled swordsmiths can manipulate the patterns to mimic the complex designs found in the surface of the original, ancient Damascus steel. Recent research into the structure and composition of true Damascus steel by a Dresden scientist has revealed that the almost mythical sharpness and strength of the steel was a result of carbon nanotubes and carbide nanowires present in the structure of the forged metal--the secret of this forging method was lost around 1800 A.D.

Origin of the term "Damascus"

The origins of the name "Damascus" remains somewhat controversial. Although it would seem obvious that it refers to swords forged in Damascus, there are several equally likely sources of the name. One is the Arabic word damas for water, referring to the surface pattern of moiré ripples which looks like turbulent water and is also seen in some damask weaves of fabric. Another potential source is the swordsmith himself: the author al-Beruni refers to swords made by a man he names Damasqui. Finally another author, al-Kindi, refers to swords made in Damascus as Damascene. This word has often been employed as an epithet in various Eastern European legends (Sabya Damaskinya or Sablja Dimiskija meaning "Damascene sword"), of which perhaps the best known are the Bulgarian and Serbian legends of Prince Marko, a historical figure of the late 14th century in what is now the Republic of Macedonia.

Manufacture

The original Damascus steel swords may have been made in the vicinity of Damascus, Syria, in the period from 900 AD to as late as 1750 AD. Damascus steel is a type of steel alloy that is both hard and flexible, a combination that made it ideal for the building of swords.

It is said that when Damascus-made swords were first encountered by Europeans during the Crusades it garnered an almost mythical reputation—a Damascus steel blade was said to be able to cut a piece of silk in half as it fell to the ground, as well as being able to chop through normal blades, or even rock, without losing its sharp edge. Recent metallurgical experiments, based on microscopic studies of preserved Damascus-steel blades, have claimed to reproduce a very similar steel via possible reconstructions of the historical process.

When forming a batch of steel, impurities are added to control the properties of the resulting alloy. In general, notably during the era of Damascus steel, one could produce an alloy that was hard and brittle at one extreme by adding up to 2% carbon, or soft and malleable at the other, with about 0.5% carbon. The problem for a swordsmith is that the best steel should be both hard and malleable—hard to hold an edge once sharpened, but malleable so it would not break when hitting other metal in combat. This was not possible with normal processes.

Metalsmiths in India and Sri Lanka developed a new material known as wootz steel. Thousands of steel making sites were found in Samanalawewa area in Sri Lanka. These steel making furnaces were built facing western monsoon winds so wind turbulence and suction was used to create heat in the furnace. Steel making sites in Sri Lanka have been dated to 300 bCe using carbon dating technology. The technique propagated very slowly through the world, reaching modern-day Turkmenistan and Uzbekistan around 900 Ce, and then the Middle East around 1000 Ce.

This process was further refined in the Middle East, either using locally produced steels, or by re-working wootz purchased from India. The exact process remains unknown, but allowed carbides to precipitate out as micro particles arranged in sheets or bands within the body of a blade. The carbides are far harder than the surrounding low carbon steel, allowing the swordsmith to make an edge which would cut hard materials with the precipitated carbides, while the bands of softer steel allowed the sword as a whole to remain tough and flexible.

The banded carbide precipitates appear in the blade as a swirling pattern. By manipulating the ingot of steel in a certain way during forging, various intentional patterns could be induced in the steel. The most common of these was a pattern of lateral bands, often called Mohammed's Ladder, most likely formed by cutting or forging notches into the surface of the ingot, then forging it into the blade shape. The notches resulted in different degrees of work hardening between top and bottom, and thus controlled the size of the carbide particles in the surface at those areas, and thus the appearance of the bands. A 2006 study published in 'Nature' determined that some carbon nanotubes are present in Damascus blades, possibly helping to account for their strength.

Attempts at reproduction

From the very start, the superior capabilities of Damascus swords attracted significant attention, and many attempts were made to reproduce either the performance or the appearance of the Damascus blades.

Since pattern welding was a widespread technique, and produced surface patterns similar to those found on Damascus blades, many people believed that Damascus blades were made using a pattern welding technique. This belief was challenged in the 1990s when J. D. Verhoeven and A. H. Pendray published an article on their experiments on reproducing the elemental, structural, and visual characteristics of Damascus steel.

Verhoeven and Pendray started with a cake of steel that matched the properties of the original wootz steel from India, which also matched a number of original Damascus swords they had access to. The wootz was in a soft, annealed state, with a large grain structure, and many beads of pure iron carbide which were the result of the hypereutectoid state of the wootz. They had already determined that the grains on the surface of the steel were grains of iron carbide, so their question was how to reproduce the fine iron carbide patterns they saw in the Damascus blades from the large grains in the wootz.

By heating the cake of wootz to just below the critical temperature which would cause the iron carbide to return to solution, it was possible to forge the wootz with hand tools. Repeated forging, working the wootz into a long, thin shape suitable for a knife or sword blade, caused the large iron carbide crystals to fracture and spread out in the pearlite matrix. The resulting steel contains bands of iron carbide in a pearlite matrix, alternating with bands of

ferrite and cementite. In this process the steel work hardens, which is what allows the normally soft wootz to be used for knives and swords.

Studies published in 2006 by Peter Paufler and colleagues of the Technical University of Dresden, Germany, utilizing an electron microscope to study samples of a 17th-century sword, have discovered clear evidence of carbon nanotubes and nanowires, and associated cementite wires. They believe that the nanotubes and the nanowires were formed by the special process of forging and annealing the steel, and could explain the unique mechanical properties of the swords.

For some time, it was believed that Damascus steel was made in a similar fashion to what is known as pattern welding, a sword making technique that was widely used in Europe and Japan. Pattern welding was very common in the ancient world; Viking swords, Japanese katana and Indonesian kris or keris swords were all made using pattern welding techniques.

Pattern welding is a mechanical process that lays up strips of material which are then pounded together, or folded, as in Japanese practice. If the blade is then etched in acid the layering below the surface is revealed, these patterns are similar to that of Damascus steel. For some time this similarity was used to dismiss Damascus as yet another pattern-welded steel, but modern metallurgy demonstrated this to be wrong.

Pattern welded steel is commonly sold today as "Damascus steel", though it appears that the original Damascus steel was not created with that technique. Pattern weld Damascus is made out of several types of steel and iron slices, which are then welded together to form a billet. The patterns vary depending on what the smith does to the billet. The billet is drawn out and folded until the desired number of layers are formed. The end result, if done well, bears a strong resemblance to the surface appearance of a true Damascus blade, though the internal structure is completely dissimilar.

Loss of the technique

For reasons that are not entirely clear, but possibly because sources of ores containing trace amounts of tungsten and/or vanadium needed for its production were depleted, the process was lost to the middle-eastern metalsmiths around 1750. It has been eagerly sought by many since that time. It has long been argued that the raw material for Damascus steel swords was imported from India, because India was the only known centre of crucible-fired steels like wootz

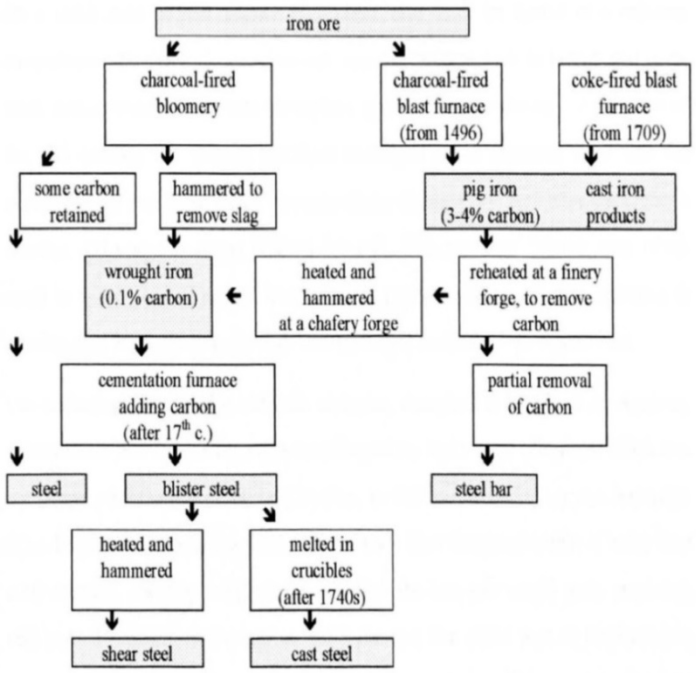
However this conclusion became suspect when the furnaces in Turkmenistan were discovered, demonstrating at least that the technique was moving out from India. The wootz may have been manufactured locally in the Damascus area, but so far no remains of the distinctive wootz furnaces have appeared. Verhoeven et al. efforts supports the hypothesis that the wootz used was from India, as several key impurities that appear to give Damascus steel its properties point to particular ores available only in India. The Russian bulat steel has many similar properties, at least in nature if not in process. Recently various groups have claimed to have recreated steel with properties consistent with true Damascus blades, through experimental archaeology, though even they admit they cannot be certain how it was originally created. Verhoeven et al. (1998) argued that the keys are ores with certain trace elements; controlled thermal cycling after the initial forging; and a grinding process to reveal the final damask pattern. A somewhat different technique was proposed by Wadsworth and Sherby (1980; also 2001).

A full account in much greater detail can be found here:

https://www.tms.org/pubs/journals/jom/9809/verhoeven-9809.html

****

This flow chart below is courtesy of M J Unwin of the University of Sheffield 2002.



Dan Hayford

Denis Hayford: An early steel master by K C Barraclough and B G Awty.

By the middle of the eighteenth century it was well established that the finest quality of steel produced was 'Double Shear', also known, after its first supplier, as 'Hayford Steel'. According to Lewis this was "...common or blister steel, doubled and forged together but converted higher than usual because it loses in forging... These steels are chiefly made near Newcastle".

Considering his importance in the steel industry, Denis (Dan) Hayford (Hayford) has remained a somewhat shadowy figure. He is known to have been connected with ironmaking operations in South Yorkshire and North Derbyshire and also in Cheshire and in Northumberland from the 1670s onwards. By 1693 he was supplying steel to the Lancashire market. By the same date he was operating the so-called Duke of Norfolk's Ironworks in partnership with John Fell and the account books have survived as the 'Staveley Ironworks Records'. These also include ledger accounts of a 'Steel Trade' in which John Fell and Denis Hayford were the sole partners from 1699 to 1724; significantly one of the very first entries is the supply of 'steel for the Northern Trade'.

From a small beginning, by the time Hayford died in 1727, this 'steel trade' was supplying some 60 to 70 tons of blister steel per annum.' One of Hayford's well known customers for steel was the Hollow Sword Blade Company of Shotley Bridge in County Durham. They appeared to prefer his steel to all other; in view of the proximity of the Crowley works at Winlaton, where steel was produced on a relatively large scale — certainly the North East was rapidly becoming the steelmaking centre of Britain at that time — this, on the face of it, was rather strange.

By 1703 the Hollow Sword Blade Company was under contract to William Cotesworth and one of the surviving manuscripts is a letter from Hayford, which is a complaint about non-payment, asking the swordmakers for a reply to be sent to him "at Roamley, per Bawtry post". Here confusion has arisen, since Hughes (?), on the basis of this document, refers to Hayford having a forge at Roamley near Pontefract;' in point of fact, neither the presence of the forge nor the town of Pontefract appear to be mentioned in the document.

Flinn quoted Hughes and this has led to abortive attempts to locate Roamley, there being no such entry in the place name lists for Yorkshire or the adjoining County of Nottingham. Hopkinson, however, in referring to the Duke of Norfolk's Ironworks in 1700, includes Denis Hayford 'of Staveley' as one of the operating partners; he also provides the interesting comment that Hayford was a descendant of that steward of Sir Francis Rockley who contrived the downfall of his master and subsequently took possession of the Rockley ironmaking activities.

The Staveley connection is quite clear from the so-called Staveley Ironworks records but is made more specific in the documents concerning a case in Chancery in 1717 arising from a claim that the right of way to Hayford's steel mill was only "a horse or foot way and not for carts or wains". In the preamble to his submission, Hayford describes himself as "of Roumbly in the County of Derby". A search of the area around Staveley reveals both Romeley House and Romeley Hall on the six inch Ordnance Survey map of 1899, between Staveley and Clowne and both are only some three miles or so from the blast furnace at Staveley. The variations in spelling become even more confusing when reference is made to the earliest surviving large scale survey of Derbyshire" which shows Ramsley; Romeley first appears on an 1835 map and persists thereafter.

At the present time, Romeley Hall is a ruin but it has proved difficult to locate Romeley House; a search for evidence of the residence of Hayford at either the Hall or the House has so far proved abortive but is continuing. If the Chancery records have only partially helped in the elucidation of the Romeley matter, they are of more substantial value in pointing out where the Hayford Steel for the Hollow Sword Blade Company originated, since Hayford clearly states that he "...for thirty years last hath been seized to him and his heirs of a certain Steele mill or mill for the making or drawing of Steele scituate upon the river Darwent in the County of Durham and standing on the north side of the river where formerly stood a come mill and a fulling mill." He goes on to report that the mill had been sold to him by Thomas Rutherford of Blackhall, the dam had been rebuilt about twenty years previously and about £1000 had been spent some five years previously in the rebuilding of the mill.

****

Sir Ambrose Crowley III

For a detailed history of Sir Ambrose Crowley and his Derwent Valley iron and steel works, please see *Men of Iron* by M.W. Flinn.

Additional information and images are also available on this website from Roly Veitch: http://www.rolyveitch.20m.com/CrowleyCrew.html

This following history is copyright R. Anderson 1971:

He was not a local man, being born at Stourbridge, in Worcester, in February, 1658, and his origins were not quite so humble as many historians have suggested, his father being a successful ironmonger, and a pioneer in the Black Country of the steelmaking industry, being also a prominent member of the Society of Friends. In 1674 Ambrose Crowley was apprenticed to Clement Plumpstead, an ironmonger in the City of London, where he served his apprenticeship (so he tells us) with great diligence. In 1681, after finishing his apprenticeship, he set up in business on his own account for the manufacturing of frying-pans, nails, brads and other small miscellaneous items of ironware, in Carey Lane, London. His business must have flourished fairly well from the beginning, for twelve months later we find him marrying Mary Owen of Condover, in Shropshire, a daughter of a wealthy landowner, and he would hardly have married if his business prospects had not been bright.

It was in this same year (1682) that Crowley quarrelled with the midland merchants who had been supplying him with raw materials. After carefully weighing up the economic factors concerned he confidently transferred his factory to Sunderland in 1683. This move seemed madness to his associates, as for one hundred years the nail industry had been settled in the Midlands but it was not such a hair brained scheme as it appeared at the time. London then, was the central outlet for the bulk of trading carried on in the country, and all goods coming to the City from the Midlands had either to be carried on horseback or hauled in waggons across country. When we consider the state of the roads in those days, transport was slow and expenses were high compared to the amount of goods carried. What struck Crowley was that the Tyne colliers sailed to London in about four days and came back in ballast, so if they carried raw material for his works it would be at a nominal charge. From the continent it was only 12½p per ton, and if he had his rod iron slit there for nails the price was cheaper still, this being much cheaper than that which his Midland rivals could supply. Likewise there was plenty of shipping at Sunderland to take his finished goods southwards to his distribution warehouses in London. Here was another advantage for one cargo ship would carry roughly the equivalent of what one goods train would carry today. Crowley stated himself that food was one third cheaper than in the Midlands, so was coal, besides being of a better quality, plus there was plenty of accommodation for workmen when needed, for the skilled workers had to be imported as well as raw materials.

The premises where he settled were only demolished in 1918. It seems to have been a substantial stone building standing on the river side, beneath a very high cliff, on top of which formerly stood St. Paul's Chapel believed to have been built in the time of Bede, and some of the old chapel stones were used by Crowley in his building operations, a stone above the door bore the date 1682.

By 1688, Crowley had about one hundred workers in his employment; some of them were Belgian Catholics from Liege, in Belgium, which was noted at that time for the proficiency of its slitting mills and the quality of its nails. For some reason, possibly because they were Catholics, these workmen were badly treated by the people of Sunderland, and Crowley had to petition the King for their protection. The petition was favourably received by King James II who was himself a catholic, and he instructed the Bishop of Durham to see to the protection of the petitioner's workmen. Whether the Bishop could not, or did not enforce these instructions, or whether the men of Sunderland took little heed of them, we do not know, but the persecutions continued. Crowley then decided to move from the area to more hospitable country in the Derwent Valley.

Although the persecution of his workmen was one of the reasons why he left Sunderland, there were others. One was the fact that there was not much room for expansion which Crowley was contemplating. In any extension of his manufacturing side steel would be needed, indeed Crowley had gained a good working knowledge of steel making from his father, the snag was that in the manufacture of steel, charcoal was needed, but unfortunately there was a ban on the cutting down of trees within three miles of the coast in those days, without wood there was no charcoal and this would hinder any expansion in steel making. The most powerful reason for moving would be the matter of capital for extra machinery and building operations. We do not know who Crowley's financier was, it could not have been his father, as his wealth for what it was, could not have covered a fraction of the resources needed for the contemplated expansion of the works. Crowley's mysterious backer was probably Sir William Bowes of Gibside Hall, for in a letter to Sir William from Winlaton in 1702, Crowley states "the greatest of my grief is that I am not in London to show how sensible I am of the great favour I have had from you even to the enabling of me to establish the iron manufactory in this country which will be to your immortal glory". This letter shows that Sir William played quite a large part in the removal of Crowley's works from Sunderland and would partially explain why such an out of the way spot was picked, and so in 1690 Crowley arrived at Winlaton.

The first thing that had to be done was to establish the main offices for the firm to take care of the administration and to get the nailors working so that as far as possible trade would not be interrupted. First of all he used the existing buildings, of which there were not many, but later the firm was to build extensively at Winlaton, Winlaton Mill and Swalwell. After a few months settling down the great expansion began. In April 1691, Crowley leased the water corn-mill and fulling mill with four acres of ground at Winlaton Mill for 99 years, with liberty to build engines and houses for the manufacturing of iron, and also to dig in the adjoining

grounds and quarries for stone and clay to be used for building purposes. Winlaton Mill in 1691 was a sparsely inhabited and secluded spot consisting of about half a dozen buildings including the corn-mill with about fifteen to twenty inhabitants, mainly farmers.

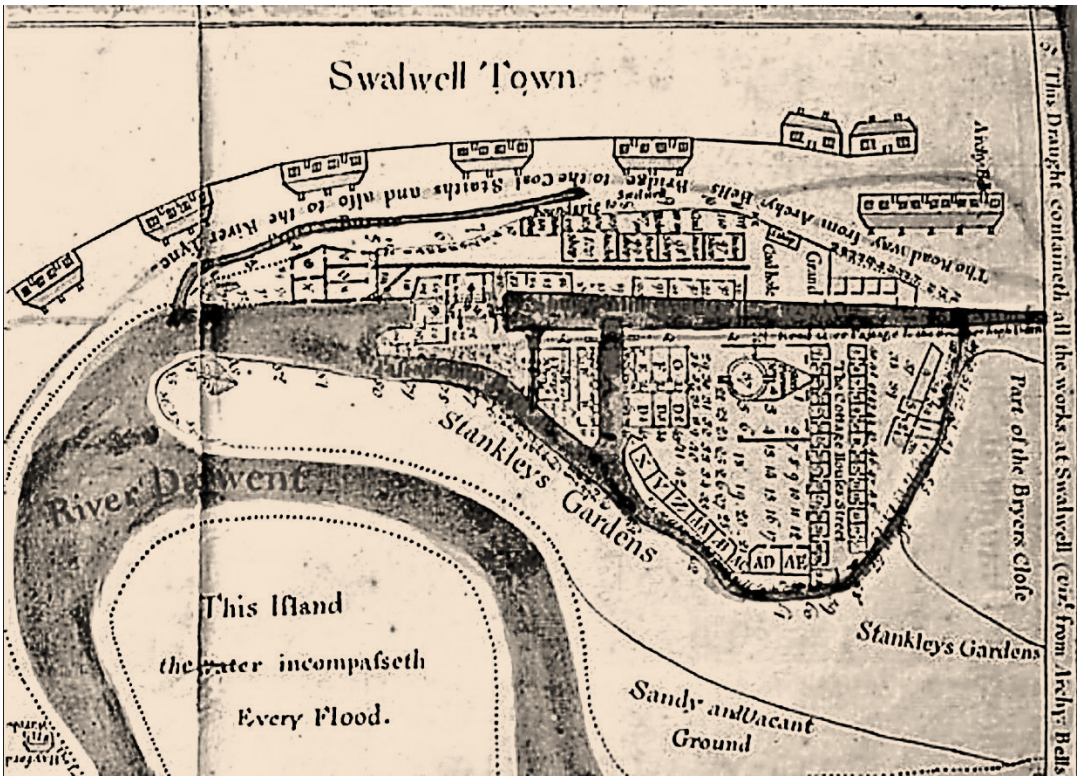
The main thing the site possessed was water power from the Derwent which is very fast flowing, this being lacking at Sunderland. By 1695, building was well advanced and the plan of the works was taking shape while Crowley was recruiting more workmen in London, for what premises would suit a nailor was quite suitable for a chain-maker, or for making locks, frying pans and almost any small item of smith work, so the works continued to expand, by 1700 the steel furnace was finished and plans for the slitting mill were going ahead. The intriguing part of the slitting mill was that most of it was made in London and then shipped by sea to Winlaton Mill, an early example of prefabrication. From 1702 to 1703, instructions poured from Crowley in London to the staff at Winlaton and Winlaton Mill, and we are fortunate in their survival although the plans which accompanied the letters have been lost, they still give a wealth of information.

In 1701, Crowley built a warehouse at Blaydon, being the nearest point on the south bank of the Tyne to Winlaton and was equally convenient to Winlaton Mill. Here the bar iron which was the raw material for the factory was landed, and the finished goods were packed mainly in barrels and sacks, then were loaded into keels for carriage down the river to Newcastle, where they were then transhipped to London.

The first opposition Crowley had to encounter was in 1702, when a partnership consisting of Edward Harrison, William Bayliss and John Arrowsmith, acquired property at Swalwell with a view to setting up an iron-works there (Harrison had been an old employee of Crowley). On the 25th March, 1702, they took a lease of a corn mill at Swalwell known as the Bishop's Mill, together with the mill dam and race. Three months later they acquired another corn mill in Swalwell called the Holm Mill, with the closes called the Holm Close and High Stammers Close. In 1703, they leased more land for the slitting and manufacture of iron, with way-leave from Swalwell, behind the Garden Close. Evidently these works were assuming a considerable scale for in 1704 Crowley received information that many of his men had left his employment to work for Harrison at Swalwell.

How much of a threat these works posed to Crowley it is not known, but by 1707 Crowley managed to buy them out, and this acquisition marks the high tide of his expansion. Some smaller additions to the firm's assets were made later, but when the necessary alterations were effected at Swalwell by 1709, the main structure of the Crowley works as it remained for over a century was completed. In fact by 1712, Crowley was prepared to complete any sort of ironware, you only had to send your request to Winlaton and any sort, shape or size would be executed. Amazingly, all of this time, Crowley had continued to live in London, although he came north fairly often. It is not known where he resided until, in 1711, he leased Old Axwell Hall until 1743, when he came to Winlaton Mill.

Although the foundations of this enterprise had been laid at Sunderland, the first real step was made in 1691 at Winlaton; in the following sixteen years, this one man created the greatest industrial expansion of the age… in the world!
Fittingly in 1706 Sir Ambrose Crowley (lll), son of a Midlands Quaker ironmonger, received his knighthood and became Sheriff of London.



Above Swalwell Ironworks c.1714 : Below: The Crowley Old Works (1950s)

Above: Slitting-Mill-Race reservoir 1930s; below: local chain-makers

THE GOVERNOR AND COMPANY FOR MAKING HOLLOW SWORD-BLADES IN ENGLAND.

WILLIAM ROBERT SCOTT.

The Constitution and Finance of English, Scottish and Irish Joint-Stock Companies.

This charter was used for three very different undertakings, namely the making of sword blades, a land company and a banking company. The original grant was dated September 15th, 1691, and arose out of a petition presented by Sir Stephen Evans and a number of others, which had been considered on the 1st of September. It set forth that the petitioners had incurred considerable expense during the past two years, in bringing from abroad and maintaining nineteen or twenty families who were skilled in the art of making hollow sword blades. The promoters had also built mills and forges in Cumberland and the adjacent counties. In view of these facts and since no hollow sword blades had ever been made in England before, nor could they then be made except by the workmen employed by the petitioners, a grant of incorporation and patent were asked for.

A warrant was issued for the incorporation of the Governor and Company for making Hollow Sword Blades in the North of England. The members were entitled to elect a governor, a deputy governor and twelve or more assistants, five of whom were to constitute a quorum. Besides the usual corporate privileges, the company was authorized to use a distinguishing mark to differentiate the sword blades, made in England, from those produced abroad. Any members of the company, not paying calls when due, were subject to the loss of the privileges of membership?

The company soon had sword blades ready to sell, and from 1692 to 1704 sales were advertised from time to time, at Cutlers' Hall, Cloak Lane.

In 1693, the court discovered that quantities of foreign sword blades had been imported, and a reward of 5s. per doz. seized was offered to anyone giving information, which would lead to the detection of the importers. In 1703 the company's warehouse was at New Street, Fetter Lane, and its mills at Shotley Bridge, near Newcastle, and at that date one of the last sales of sword blades was held… the company having embarked on a career of speculation in land.

It was stated that the original manufacturing company "did not succeed as was expected" but it is recorded that, as late as 1703, a dividend of 4 per cent. was paid. It is somewhat doubtful, too, whether it is correct in saying that the original proprietors "sold or assigned their patent to another company of merchants in London."

Whether the Sword Blade company was successful or not, it managed to keep its works open. It is possible that in the first years of the eighteenth century the old company may have sold its patent and works to the new one, and that the latter carried on the original business, as well as their dealings in land. However this may have been, the company after l702 entered on a new era in its history.

There had been a considerable amount of discussion, both in Parliament and in various publications, as to the policy of dealing with forfeited estates in Ireland.

At first these had been disposed of by grants from the Crown, but it was contended such grants should be "resumed" and the lands sold for the benefit of the public, in order to reduce the debt occasioned by the military operations in Ireland after the Revolution. At length on July 16th, 1702, it was announced that the forfeited lands would be sold on October 20th and following days. The company, that then owned the Sword Blade charter, decided to come forward as a purchaser. As the amount required would be large, the question naturally suggests itself as to how the court proposed to raise the capital required. The adopted was that of the Bank of England, the Million Bank and a number of other undertakings of the period.

The great want of the time was actual cash; and, since the government would accept payment in its own obligations, it was decided that the company should invite persons, holding Army Debentures, to subscribe these, receiving the company's stock in exchange, while the Debentures were returned to the State, in payment of the purchase-price of the estates. By June 25th, 1703, £150,000 of Debentures had been subscribed, and a fresh subscription was taken?. In all, estates, returning £20,000 a year, were purchased, including widely scattered lands with a very extensive acreage.

The inducement for persons, holding Army Debentures, to exchange them for Sword Blade stock was that they replaced a government, by a landed security – the latter being generally held more desirable at the beginning of the eighteenth century. Interest on the various government debts was often in arrear, and the rents from the Irish estates ought to have provided an income, at least not more uncertain. From the point of view of the security of capital, the scheme seemed equally promising. The forfeited estates were being disposed of by a forced sale, and it was only to be expected that, with more settled political conditions, the land would increase in value.

On the other hand, the Army Debentures were below par, and therefore it would seem to be wise to exchange a depreciated security for one which would be likely to improve in price. Such a calculation was on the whole borne out by the quotations of the two stocks – "Sword Blades" touching 91¾ in 1704, whereas the highest price of the Debentures was only 85, on the other hand the former stock fell rather lower than the latter, so that the average price of the year was practically the same for Sword Blade stock as for the Unconverted Debentures.

Difficulties soon began to arise. On February 14th, 1704, the company stated in a petition that other purchasers of forfeited lands had at that date only paid one-third of the price. Some of them were anxious to borrow the money necessary to complete the transaction, and the company was willing to lend it on the security of the estates. But, in case such pledged properties reverted to the company, the court was in doubt whether it was legally entitled to accept conveyances from any other

persons than the Trustees for the sale of Forfeited Estates, and it asked a license from the government, enabling it to do so. The English Parliament, being desirous to dispose of the lands, endeavoured to facilitate the transference of them to the company, but the Irish Parliament viewed the whole proceedings with little sympathy. Already many English corporations and individuals had secured land in Ireland – from the establishment of the Irish Pale, the various plantations of Ulster, down to the time of the Cromwellian Settlement. It had frequently been said that the "Anglo-Irish" or the descendants of English immigrants, were opposed to fresh importations of either capital or energy. Therefore, the Irish Parliament placed difficulties in the way of the company, and it was found that a complete title could not be obtained. These facts reacted on the prospects of the undertaking, and the price of the stock began to fall. Throughout the year 1705, the quotation fell steadily, till it was no better than 57 on December 5th, as against 79 for unconverted debentures. In the following year the extreme prices were 72 and 57, in 1707 65 and 55.

Meanwhile the loans, made to other purchasers of Irish estates in 1704-5 had suggested a new class of business. Not only was money advanced, but notes were issued and cash received on deposit, and it was alleged that this company had aided a run made against the Bank of England.

When the bill was drafted for restraining all corporations from banking, with the exception of the Bank of England, this undertaking protested vigorously, urging that the competition of the two companies had resulted in bringing interest lower than it had been since the Revolution. This protest was ineffectual, and the Sword Blade undertaking was debarred from banking, as a corporation, after 1708. The company was thus thrown back on its land-development enterprise, and it had purchased estates to the value of £208,867. 5s. l0d., besides paying off encumbrances amounting to upwards of £60,000. Feeling in Ireland was opposed to the corporation, and suits were started against it in the Irish courts on the question of title. The company contended that the act of the English Parliament guaranteed it a clear title, irrespective of the original deeds, and a further act was passed in its favour; but the Irish House was hostile; and, in 1708, it was known that it would not suffer the company to enjoy the estates, unmolested, whereupon the stock fell to 51. During the next four years the lands were being resold and the company wound up. There was some improvement in the market for the shares, which touched 69 on March lst 1710, but fell to 58 in July and August 1711. The final cash distribution appears to have worked out at about 59 – the price, in 1712, being 58 to 60 – while the price of the Debentures about the same time varied between 93 and 73, so that the speculation had proved unfortunate for those who subscribed. This result is to be ascribed to the hostility of the Irish Parliament; indeed, one of the grounds on which its action was based (namely that the estates had been purchased at an abnormally low rate) should have made for the success of the company, had it been given a free hand and provided its management had been successful.

Strictly speaking this enterprise, for which the charter was next used, falls outside the limits of the present work, since the final phase of a diversified career relates to a partnership, rather than a company. However, this last stage is so closely related to the fortunes of the South Sea venture that it will be convenient to add some account of the Sword Blade Bank.

In fact the enterprise carried on from 1704 to l711 was very closely connected with the South Sea Company in many respects, and the latter may be considered from one point of view as the continuation of the former. In both there was the same idea of converting government debt into the stock of a trading company, and it may have happened that some of the securities, released by the sale of the Irish estates, were re-subscribed at the floatation of the South Sea Company.

It was undoubtedly the experience gained in the earlier undertaking by Elias Turner, Jacob Sawbridge and Sir George Caswall which aided in determining many of the financial methods of the later one. These three were in partnership in stock-exchange transactions, and they were described as "having so many bear-skins pawn'd to them at a time, so much stock deposited with them upon bottomrée, as it might be called, that indeed they may be called the city pawnbrokers; and I have been told, that they have fifty stockjobbers and brokers bound hand and foot and laid in heaps at their doors at a time'." The partners were left with the Sword Blade charter, after the land undertaking was wound up, and they used it to recommence banking of a somewhat speculative character. Two of them (Sawbridge and Caswall) were directors of the South Sea Company, and their bank, now known as that of the Sword Blade, became the "cash-keeper" of the former.

In the *Anatomy of Exchange Alley* there appeared the following description of this trio. "Caswall, a man of brass sufficient for much more business than he can be trusted with…. he rather is directed than directs, and, like a certain great general, famed for more fire than phlegm, is fitter to drive than to lead. Sawbridge has twice the head but not half the business as Caswall is said to have…. Sawbridge is as cunning as Caswall is bold, and the reserve of one with the openness of the other makes a compleat Exchange Alley man.... Turner, a gamester of the same board, acts in concert with Caswall and Sawbridge and makes together a true triumvirate of modern thieving: he inherits the face of Caswall with the craft of Sawbridge, but seems to take state upon him and acts the reserved part more than either." The citation of these extracts is an exception to the rule, observed elsewhere in this work, of refraining from quoting scurrilous contemporary judgments on individuals; but, in this particular case, the conclusion of the estimate of the partners in the Sword Blade Bank, published in 1719, constitutes such a remarkable prophecy of the events of the following year that the foregoing passages are necessary to give point to it.

The writer concludes: "The truth is, it has been foretold by cunning men, who often see what can't be hid, that these men by a mass of money, which they command of other peoples as well as of their own, will in time ruin the jobbing trade.

But 'twill be only like a general visitation, where all distempers are swallowed up in the plague, like a common calamity, that makes enemies turn friends and drowns lesser grievances in the general deluge."

There can be little doubt that the knowledge of market-manipulation, attributed to the partners, helped to determine the direction of South Sea finance. They were in the inner councils of the directors; and it was by their aid that some of the most secret portions of the scheme of inflation were carried out. It follows that all the most profitable portions of the great conversion were reserved for the Sword Blade Bank, and its bonds or notes were issued for the part of the price, fixed for the annuitants, which was to be paid in "cash." On June 15th, 1720, a new partnership was formed by the inclusion of Henry Blunt – a son of Sir John Blunt, one of the leading directors the South Sea company – and Robinson Knight, a nephew of Robert Knight, the secretary. During the height of the boom, the Sword Blade Bank commanded immense influence; but, when the fall began, its position was endangered, and on September 24th, it was forced to suspend payment. The complicity of the partners, in many of the most discreditable episodes of the conversion, occupied much of the attention of the Committee of Secrecy, appointed by the House of Commons; and it was discovered, as that enquiry progressed, that many of the books and documents of this bank had been destroyed or tampered with. For this reason those members of the firm, who were also directors of the South Sea company, would have been severely dealt with, were it not that they had given some assistance to the Committee, when enough was found out to make further disclosures inevitable. After the suspension of payment in 1720 business was resumed by John Caswall and John Mount.

This firm continued till 1742 when it failed.

A History of Finance at The Tontine Coffee House: The Sword Blade Bank.

Establishing a corporation used to be a rare feat, not as simple as filing a form. Indeed, incorporation and the legal benefits it provided to financial and non-financial firms were closely guarded rights, the product of charters rarely conferred. So, if a corporation’s business model was on the way out and its value dwindling, it would still be protected from true worthlessness by its charter. Even a shell company could be worth something, especially in the days when incorporating was not straightforward, in England or anywhere else. One would rather sell or reinvent a business than dissolve it and lose that valuable intangible asset, a corporate legal identity.

In the first few years of the 18th century, this is exactly what happened with the Hollow Sword Blade Company, a sword manufacturer in England turned land speculator in Ireland. The company even entered the banking business, a long cry from its original purpose of producing armaments. The company is a curiosity but is also significant to the history of finance if for no other reason than the fact its business model was a precursor to that of the South Sea Company of bubble fame.

One of the most astounding corporate reinventions in history took place at the very start of the 18th century. (cont.)

(cont.) It was a decade earlier though, in 1691, that the Hollow Sword Blade Company was not so tersely incorporated as "The Governor and Company for Making Hollow Sword Blades in England"

It was established by financiers Sir Stephen Evance and Sir Francis Child who paid £50,000 to secure a charter from Parliament, then an infrequently bestowed, and in this case expensive, privilege. The company's charter gave it limited rights but these crucially included the ownership of land in its own name.

Whatever its later financial operations, the Hollow Sword Blade Company began as a manufacturer or rapiers, a sword then used by European armies. There had been growing demand for the weapon spurred by the expansion of the army and the Nine Years' War then underway. The company was conceived to provide an alternative to French blades whose importation was banned during the war, but first, the company had to import foreign workers with knowledge of making the swords. Such was the shortage of production, and its associated know-how, in England. (*Much of the preceding paragraph is obviously erroneous. KF*)

Charter of the Hollow Sword Blade Company, 1691:

"We have given and granted, And do hereby for Us our heirs and successors give and grant, unto the said Governor and Company and their successors, agents, workmen, and servants the sole power, privilege, and authority of using and exercising the said instruments, engines, and mills for making hollow sword blades within this our Kingdom of England and all our other Dominions" –

For whatever reason, the owners of the Hollow Sword Blade Company wanted out within a few years of the company's formation. This may have had to do with the end of Nine Years' War in 1697 which reduced military demand for swords. In any case, the company was acquired by new entrepreneurs sometime around 1700. The new proprietors of the Hollow Sword Blade Company included Elias Turner and George Caswall, both bankers, and John Blunt, a shoemaker's son who became a broker and then a baronet.

For '2nd syndicate' members Evance, Child et al., swords were never the object of the exercise; the opportunity to acquire the charter was everything. KF.

This was to become an illustrious set and included future directors of the infamous South Sea Company, whose own creation was a few years out. These men were nonetheless more interested in banking than sword making. The company was reinvented; its factory was leased to new operators and the last batch of rapiers was advertised in December 1703.

Rather than manufacture swords, the company's attention shifted to real estate, specifically Irish real estate. The opportunities there arose from political circumstances. The Glorious Revolution of 1688 had brought William and Mary to the throne in England and Scotland; however, it initially brought war to Ireland, where the armies of William III and the ejected king James II fought for control.

Williamite victory resulted in the confiscation of estates belonging to James II's supporters, of which there were many in Ireland. So many, that one million acres valued at £1.5 million was seized. Initial plans to dole out the property to the supports of William III was halted and replaced with a scheme to liquidate the estates to pay off the debt accumulated during the war and restore the government's credit, which had never been good in the preceding century.

However, the estates put up for sale garnered limited demand due to distrust in the inviolability of title to the seized land and a scarcity of local buyers with sufficient capital in Ireland. Despite this, the Hollow Sword Blade Company emerged as an unlikely external buyer. Under its financially minded managers, the company purchased much of the unsold land at low prices, acquiring a quarter million acres in Irish estates for £200,000. This was land previously valued at close to £300,000 by the trustees arranging the sale for the government and the rents generated by the land were estimated to be £30,000 per year. If the rents were realized this would have amounted to an annual return of 15%.

"The next Trick they tried, and which was indeed the Master-piece of their Knavery, was getting an Assignment of the Forfeited Estates in Ireland into their Hands: Indeed they began the World upon this Prospect, and expected to have had the whole Kingdom of Ireland mortgaged to them" – Daniel Defoe in The Anatomy of Exchange-Alley, 1719

Not even twenty years later, another financial entrepreneur attempted something similar with properties confiscated in Scotland after a revolt there against the king, George I. However, property in Scotland could not be had as cheaply as it could in Ireland and the company involved in those investments, the York Buildings Company, paid over £300,000 for estates earning cumulative rents of £15,000 annually, a 5% yield on the invested funds. Nonetheless, that firm became one of the largest landowners in Scotland as had the Hollow Sword Blade Company in Ireland.

The large purchases by the Hollow Sword Blade Company raise the question of how such purchases were financed. After all, how much money had the company made selling swords? The answer is unknown but also irrelevant because the company funded its Irish land purchases by issuing new shares.

However, this was not a typical offering of stock. Rather than raise cash exclusively, the company allowed investors to trade army pay debentures, and

other state debts then trading at a discount, for shares. This gave the company a portfolio of government securities acquired for less than face value. These securities were then exchanged for the Irish estates; Parliament had encouraged the transfer of Irish land for the cancellation of debts as a solution to the country's indebtedness. This became the preferred method of purchasing land because purchasers were able to apply the debentures at face value towards the acquisition price even though their market values were lower.

The company initially recorded the acquired land in its books for £400,000 and this proved to be a gross overvaluation. First, rents came in below expectations, just £18,600 was earned after a year as economic problems in Ireland made rent collection difficult. Further, title to land was always perilous in Ireland where disputes were common and lawsuits often held in a legal limbo between Irish and English courts with different sympathies. In the end, the company sold most of its Irish estates by 1710.

Issuance of its new stock made the previously obscure company the seventh largest in England. The company did not wait until it was divested of its property in Ireland to reinvent itself yet again, this time by transitioning into banking. From here, the company became even more widely known as the Sword Blade Bank. The firm began offering mortgage financing to other purchasers of confiscated Irish estates starting in 1703. It earned 6% on this Irish lending but also lent against government securities in England at 5% interest. It is crucial to note that the Bank of England, established not that long ago in 1694, still had a monopoly on banking in England. So, the Bank sued and petitioned Parliament in order to defend this monopoly.

The Bank of England was successful in stopping the Hollow Sword Blade Company from lending money after new legislation on the issue was passed in 1708. Not only was the lending business discontinued but these events may have encouraged the company to abandon its Irish business altogether in 1709-10. It sold the Irish land at a loss but considering it used debts trading at a discount to make the purchases, it likely broke even in cash terms. However, as a consolation of sorts, the company did get the right to conduct a state lottery to raise £2 million, a right previously belonging to its foe, the Bank of England.

Regardless of its constantly shuffling business interests, the company's leadership saw their reputations rise. The founders found high positions at other firms. John Blunt became a director of the East India Company for example. They also had the ears of the politicians. George Caswall may have come up with the idea of the South Sea Company in a letter to Robert Harley, the Chancellor of the Exchequer. Caswall later became a director in the South Sea Company as did another partner at the Hollow Sword Blade Company, Jacob Sawbridge

The South Sea Company was a mirror of the Hollow Sword Blade Company in many ways. First, there were the common leaders in men like Caswell and Sawbridge. However, some elements of the concept behind the South Sea Company were a copy of what was done in Ireland.

Like the Hollow Sword Blade Company's Irish land purchases, the South Sea Company was funded by the conversion of public debt into stock in the private company. The list of connections between the firms continues.

The Hollow Sword Blade Company again tested the Bank of England's monopoly, lending against South Sea Company shares during the boom years. In 1720, the company suspended new lending when the price of South Sea Company stock began to fall but it was too late. The former sword manufacturer failed when the South Sea Bubble continued to unravel in September 1720.

The Hollow Sword Blade Company failed just as the South Sea Bubble crashed back to earth. It was a fitting end; the firm was just like the South Sea Company, a monument to the financial innovation, or improvisation, of the times. A company originally engaged in making swords became the seventh largest company in England, one of the largest landowners in Ireland, and a firm, along with its leaders, involved in the making of one of the first financial bubbles in history and perhaps the one with the longest lasting consequences.

Promoters of the South Sea Bubble

OXFORD DICTIONARY OF NATIONAL BIOGRAPHY: W. A. Speck and Matthew Kilburn.

Promoters of the South Sea Bubble (act. 1720), were the ringleaders of the most notorious episode in the history of eighteenth-century financial speculation. The South Sea Bubble seemed to contemporaries to be like an attack of mass madness, affecting all levels of society, as a large swathe of the population became convinced that their fortunes could be transformed by investing in the South Sea Company. Where the stock market had previously been regarded as the new-fangled invention of moneyed men to make money make money, the main investors being identified with the commercial sector of the City, by 1720 all types and conditions of people—nobles, country gentlemen, Oxford dons, clergymen, as well as women of various social ranks—were infected by the fever of speculation

Yet although there were hundreds of enthusiasts, there were only a few key players. Prominent among them was Sir John Blunt, who in 1703 became secretary of the Sword Blade Company. The company had been established by royal charter with the intention that it should manufacture swords, but by Blunt's time it dealt in forfeited estates. It handled government credit on such a scale that it was placed alongside the Bank of England and the East India Company as underwriters of the national debt. It thus set a precedent for the much more ambitious scheme associated with the launching of the South Sea Company in 1711, partly as a tory rival to the whiggish bank and East India Company, but mainly with the aim of transforming the unfunded debt into its stock.

The idea of consolidating some £9 million of debt not secured against revenues to be realized from taxation was that of Robert Harley, prime minister in the tory government formed the year before. His scheme of financial consolidation worked, despite the disappointing commercial performance of the company, which had been expected to realize huge gains from being allowed to trade with Spanish America after the treaty of Utrecht in 1713. Blunt was a director of the company from July 1711 until his downfall and disgrace in February 1721. Inspired by the success of John Law's financial schemes in France, in 1719 Blunt advocated the conversion of over £1 million owed by the government to state creditors into the company's stock. Again the exercise was successful, and reaped a handsome profit for the company into the bargain, as its stock sold above par. This taught Blunt that whatever means necessary should be undertaken to keep the price of the stock high and thus sustain the company's credibility.

The fateful year 1720 began with Blunt ambitiously proposing to transform into South Sea stock over 60 per cent of the remaining national debt. Initially he offered to lend the government £3 million if the conversion went through. But the bank insisted on its bid being considered too. Rival bidding ensued between the bank and the South Sea Company, which ended with Blunt undertaking to advance £7.5 million to the Treasury. Again the price of the stock on the market would have a direct impact on the profitability of the scheme for the company: 'Its profit would come from the difference between the proceeds of this sale and the sum payable to the government'. Blunt used all means to drive up the price of stock, including setting aside some £500,000 of it to reward politicians, or more prosaically bribe them, among them the first lord of the Treasury, Charles Spencer, third earl of Sunderland, the chancellor of the exchequer John Aislabie, and the postmaster general James Craggs the elder. Aislabie acquired stock valued at £77,000 which he sold for nearly double that sum. Blunt's efforts were rewarded with the increase of stock with the face value of £100 to £130 by April and £745 in June. He himself was rewarded with a baronetcy that month. In July stock rose to £1000.

Then the crash came. The price of £1,000 of stock fell to £290 by the end of September, and to £170 by mid-October. Many were losers from the bursting of the bubble. Even George I lost £56,000. One of his physicians, Sir David Hamilton, reputedly lost £80,000. James Brydges, Duke of Chandos, who had made a fortune through some shady deals as paymaster general to the forces abroad in the War of the Spanish Succession, was one of the many who speculated in South Sea stock to their financial detriment. There were some spectacular bankrupts, including Sir Justice Beck, a City magnate.

Thomas Green, bishop of Norwich, regarded the collapse of South Sea stock as a judgment from God on 'the universal inclination of all ranks of men and women to too excessive gaming' which led to the occasion of bringing such a curse and blast upon us, as never was felt before by this Nation; by which we have been all of a sudden strangely impoverished in the midst of plenty, our riches having made themselves wings, and flying away nobody knows whither, and more families and single persons have been undone and ruined than hardly ever were known to have been so, by the most tedious and lingering war.

'Enthusiasm in different shapes returns often upon this poor nation', observed White Kennett; 'we have had religious enthusiasm, political enthusiasm, and this was merely secular enthusiasm'.

Those who suffered demanded retribution against the company and the corrupt politicians who had been bribed by its directors. Thomas Gordon and John Trenchard launched Cato's Letters to bring the suspects to justice. 'Let us pursue to disgrace, destruction, and even death', they fulminated, 'those who have brought this ruin upon us, let them be ever so great, or ever so many'.

Although Blunt was a prime target among those who had managed the company's affairs, another was Robert Knight, its cashier since its inception. Knight had been associated with Blunt from the days of the Sword Blade Company, and was mainly responsible for the bribery of peers and MPs to secure parliamentary acceptance of their scheme to convert annuities into South Sea stock. He had even recorded these transactions in a green book. In January 1721, along with Blunt, he was summoned to attend a Commons committee charged with investigating the affairs of the South Sea Company. Under examination Knight admitted to the dubious methods used to obtain the support of politicians. He refused, however, to identify any of them, and during an adjournment of the committee fled to the Austrian Netherlands, taking the green book with him. There ensued an elaborate charade in which the British government officially requested Knight's extradition by the Austrian authorities, while unofficially letting it be known that they were happy to let Knight remain abroad with his incriminating evidence.

Although Knight's landed estate was confiscated to compensate those who had suffered hardship from the collapse of the company, he took sufficient assets abroad to set up a comfortable lifestyle in France. The directors of the company at the time of the crash were all investigated by parliament. Each director had to prepare a full statement of his accounts for the period between June 1720 and March 1721: 'it is probable that no fuller description of the properties and activity of a representative business group exists in so accessible a form for any period of history'.

Under the provisions of the South Sea Sufferers' Bill (1721) a proportion of each director's estates was seized to help compensate those who had suffered losses. The director who suffered most was Francis Hawes, a Treasury office-holder who had built up a substantial art collection and acquired two country estates on the back of his profits from the administration of public funds: he was at first allowed only £31 0s. 2¼d. from a declared fortune of over £40,000 (substantially lower than its real value of £165,587).

The richest director, James Fellowes, sub-governor of the company, kept £10,000 of assets of £243,000. Charles Joye, deputy governor, was allowed £5000 of his £40,000.

Other leading directors to be punished were Stephen Child, banker, and Richard Houlditch, receiver-general of the Stamp Office, close associates of Blunt and Knight respectively; Robert Chester, goldsmith and West Indies planter, and Edward Gibbon, a broker, who had both been involved in the secret allocations of stock to people of influence; Jacob Sawbridge (d. 1748); the company's accountant, John Grigsby; and the company's deputy cashier, Robert Surman. Other directors punished included Jacob Jacobsen, steelmaster; Richard Horsey, Arthur Ingram, William Tillard, and James Edmundson, who had become involved principally as friends of other directors; and the merchants Ambrose Page, Peter Delaporte, William Morley, Hugh Raymond, William Hamond, and William Astell, 'one of the most talkative witnesses during the investigation' and thus one of those singled out for strong punishment by the government. Another group of directors were principally financiers, including John Gore, Thomas Reynolds, Sir William Chapman, Sir Lambert Blackwell, Samuel Read, Harcourt Master, John Lambert, and John Turner; most of them were treated harshly, particularly Read, Lambert, and the widow of Master, all of whom were thought to have profited excessively.

Those directors who were members of parliament faced a further sanction. Sir Theodore Janssen was allowed to keep £59,000 of his estate of £243,000, but as he was an MP he was expelled from the house. Other MPs associated with the company who were expelled included Sir George Caswall, Robert Chaplin, and Francis Eyles. Chief among them, however, was John Aislabie, the chancellor of the exchequer. On 8 March 1721 the House of Commons resolved that he had been guilty of 'most notorious, dangerous and infamous corruption'. He was not only expelled from the house but sent to the Tower of London, though eventually he was allowed to keep all the property he had held before he became chancellor, and retired to his estate at Studley Royal near Ripon.

Aislabie's was the most significant scalp acquired by those seeking vengeance on the authors of the bubble. They failed to acquire that of Charles Stanhope [see under Stanhope, William first earl of Harrington], the secretary of the Treasury, who escaped the censure of the Commons by a mere three votes after George I intervened on his behalf. To him might have been added his cousin James Stanhope, first Earl Stanhope, the secretary of state, who died after bursting a blood vessel during a debate in the Lords defending himself against charges of corruption. So might James Craggs the elder, who apparently committed suicide. There was bigger game in the sights of the critics of the South Sea Company, however, including the earl of Sunderland and even courtiers close to the king.

Sunderland was saved from a hostile resolution in the Commons by 233 votes to 172. This outcome was largely the result of an outstanding performance by Sunderland's arch-rival, Robert Walpole. Stanhope and Sunderland had been the victors in the struggle for power between them and Townshend and Walpole which brought about the Whig schism of 1717. Although they had been superficially reconciled in 1720, when Townshend and Walpole had been brought back into the ministry, Townshend and Walpole had been accommodated very much as junior ministers, and their ambition was still manifest. While it might have seemed to be in Walpole's interest to throw Sunderland to the wolves, in fact it was politically astute to defend him. That was one way to keep the support of the king, who possibly saw himself in the firing line if his chief minister fell. **Indeed the unpopularity of George I was such that many, and not just Jacobites, thought that if the Stuart pretender 'James III' had chosen to invade England, then he would have met little resistance.**

Walpole's measures helped to preserve the house of Hanover. They also preserved ministerial unity at a time when a general election was not far off. Moreover, although they earned for Walpole the opprobrious nickname of 'the screen master general', as far as he was concerned his tactics worked. The price of his support for Sunderland was that he replaced his rival as first lord of the Treasury on 3 April. And, though he could not ignore the earl's continued wish to return to power, until Sunderland died in 1722, Walpole effectively became prime minister, in collaboration with Townshend, from that date. Walpole's grasp of financial policy helped to restore sanity to the public finances following the collective madness of 1720.

Cotesworth

A short essay culled from David Richardson regarding this phenomenon of an individual, followed by a description of the character of the man from Ms Ellis and her study of his documents: The Cotesworth MSS.

N.B. The Cotesworth MSS are 13,000 documents in six chests that were discovered in the Black Gate in 1940 by Professor Edward Hughes and subsequently saved from the pulp mill.

From David Richardson:

> "Cotesworth's main trading interests - as well as the sword blades - were dealings in dyestuffs, indigo, argol, cochineal, copperas, galls, logwood and sanderswood, fustic and woad and other expensive dyestuffs from the Indies and the Levant.
>
> He dealt in various kinds of ashes, soap and oil. He supplied sugar, tea and chocolate to landladies and clergymen in Cumberland and even tobacco (made up in fourteen pound packets). Alderman Ramsey, who was now a relation by marriage, bought the tobacco in bulk. Both Ramsey and Cotesworth regularly purchased flax, tow, madder, whale fins from Rotterdam and alum from Hamburg.
>
> A London wine agent - as well as his usual line - advised Cotesworth on the current prices of wheat, rye, barley and beans. Some of the barley and rye for the famous 'Geordie' loaf had to be imported but then Cotesworth also imported hops for the equally famous local ale and between wars he imported from France (Bordeaux), wines, cherry brandy and prunes.
>
> On his own doorstep: Gateshead, were the quarries of Whickham, Gateshead Fell and Wraken Dyke, which gave up their grindstones and whetstones to pass through his hands at a profit. There were eleven quarries at Wracken Dyke alone and in addition to grindstone quarries there was a stone quarry in Quarry Close, Gateshead to add to the Gateshead merchant's paper work.
>
> Dealing in salt, he acquired salt pans at Shields and by the end of Queen Anne's reign in 1714 he claimed to be the biggest salt proprietor in the country. Shortly after that he held the contract to supply the Victualling Office and his trading turnover had reached £30,000 a year."

Cotesworth: JM Ellis.

Cotesworth's papers chart his rise through apprenticeship in trade to landed prosperity; from plain Mr. Cotesworth, tallow chandler of Gateshead, to the 'worshipful' William Cotesworth, esquire, of Gateshead Park. It would not be accurate to describe him as a typical Newcastle merchant, for he was not a member of the town's merchant class either by birth or settlement. On the contrary, he was and remained an outsider, conducting his business from the suburb of Gateshead on the south bank of the river. Cotesworth was born about 1668, the second surviving son of a Teesdale yeoman family which had apparently been freeholders in County Durham for two hundred years. His eldest brother Charles remained on the land while the younger sons were apprenticed as merchants, a practice that seems to have been followed for generations. The family was well represented in the trading and professional classes in both Stockton and Newcastle. In the mid-seventeenth century a William and Michael Cotesworth, possibly his uncles, had been apprenticed in the Hostmen's Company and had established their 4 children in the business and professional classes. Cotesworth, however, did not have the advantages which apprenticeship in a prestigious Newcastle company provided, which may indicate that the family's fortunes could not keep pace with the rising cost of setting up younger sons in the more honourable and profitable trades. Moreover, it does not seem that his prosperous Newcastle kinsmen gave him any considerable help in his early years. He was therefore forced to make his own way in the world, and the younger son of a yeoman family, lacking the financial resources and connections which were vital to success, had little chance of rising far in trade.

Certainly there was ample opportunity for advancement in the commercial activity of the Newcastle area, but even those with adequate financial and family support needed good fortune and ability to seize it. When questioned about their prosperity, most successful merchants would probably have replied in terms of the grace of God and the rewards of hard work. Cotesworth was no exception to this. He wrote to a correspondent in 1717 that his interest in the salt industry had been placed in his hands by 'providence of his Goodness', but he was also convinced that Providence was on the side of those who helped themselves and concentrated on their business. Yet hard work alone could not guarantee success, as the number of ambitious and determined men in debtors' prisons demonstrated. In order to survive, let alone succeed, in a world that was not charitable to the underprivileged, a combination of more than ordinary ability, industry, coolness, thrift and good fortune was required.

Cotesworth was certainly able, possessing what his friend Henry Liddell called 'a head & Genius in Business'. He also had considerable drive and an abundance of tireless energy. It was accepted by friend and foe alike that he was a 'bold adventurer', with 'a Head ... fitted for troublesome undertakings', and he was regarded as a formidable man to deal with. Despite frequent illnesses, which caused him a great deal of pain, he permitted no slackness either in himself or in his servants. His 'diligence and indefatigable industry' were admired and relied on by his friends and business associates and, once he had undertaken a project, he pursued it relentlessly.

He demanded that factors and correspondents conduct their affairs as vigorously and punctually as he would himself and, when he was forced to leave the management of his business in the hands of his clerks, every post brought a letter railing against their weakness of character, undisciplined working habits, lack of foresight and apparent inability to grasp the value of his time and money. Inefficiency exasperated him. As his business interests grew, it became necessary to delegate responsibility, but it did not come easily to him because he knew that he could do the work so much better himself. His zealous pursuit of profit was, however, tempered by good sense and coolness in his affairs.

These were indispensable assets to anyone engaged in a precarious occupation like trade. Several years after his death a lawyer dismissed a claim made on the estate on the grounds that 'it is so inconsistent with Mr. Cotesworth's prudence... that I have no faith to believe it'.

Equally vital at a time when business was conducted to a large extent on credit was a reputation for honest, punctual dealing, and Cotesworth defended his character against accusations of dishonesty as he would defend any other asset. His partner in one venture described him as an honest, punctual and honourable dealer, who despised men of 'ye Contrary Qualifications', but the letter indicates that his punctuality at least was doubtful. The credit system gave an advantage to anyone who could delay payments while collecting promptly from his own debtors, and Cotesworth does seem to have held on to money passing through his hands for as long as possible, to the occasional discomfort of his factors and correspondents. Provided these tactics were not carried so far as to reflect on his credit rating, they were probably regarded as legitimate business.

This was one aspect, perhaps, of the 'prudent frugality' which Cotesworth recommended to his elder son as the best form of insurance against bad luck. Thrift on the part of a young merchant allowed a great deal of self-financing through the immediate ploughing-back of retained profit, and the habit of saving seems to have remained with Cotesworth throughout his life. Even in his later, prosperous years, he preached and practised abstinence with the same zeal that he advocated efficiency. In 1717, for example, when his land and business ventures were fielding an estimated £5,500 a year, he calculated his annual Q expenditure at no more than £500, leaving a surplus which he proposed to invest. It was typical that in his will be asked to be buried 'with as little expense as common decency will allow'.

Certainly Cotesworth possessed many of the qualities necessary for success in business, and the history of his early years in Gateshead shows that he had the most vital quality of all - good luck.

By 1703, however, Cotesworth had begun to acquire outside interests. At the instance of Robert Peter Renew, one of the directors of the Hollow Sword Blade Company, he agreed to act as the company's local agent, arranging shipment of the blades to London and paying the German craftsmen who ran the workshops at Shotley Bridge on the river Derwent, a tributary of the Tyne. By 1710 he owned the enterprise.

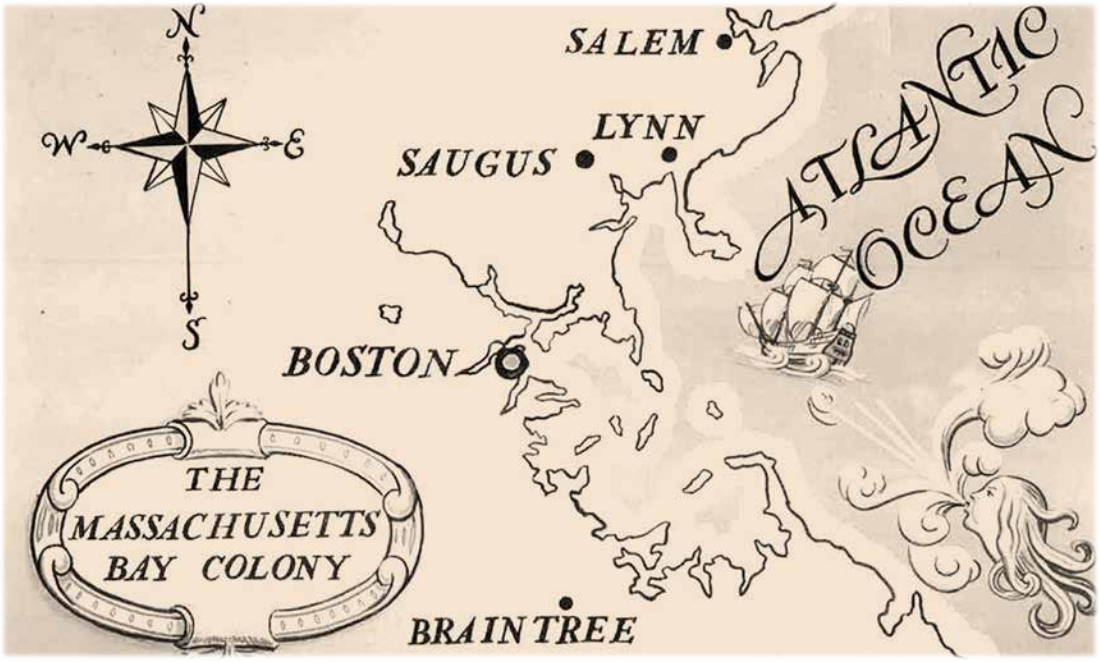
(Additional note from KF)

1726: Cotesworth's butler and gardener were both whipped and pilloried at Newcastle Market for the attempted murder of Cotesworth by arsenic poisoning on behalf of Sir Richard Ridley who supported the two men during their imprisonment. Ridley had bought a lot of land in Heaton but did not get the mineral rights, i.e. coal, which had gone to Cotesworth. Ridley never stopped trying to wrest those rights away from Cotesworth and this was just one more failed attempt.

Massachusetts.

The appearance of the Vintons in England in the 1500s, plus the presence of Jenkes in the early 1600s, has given rise to these – essentially gratuitous – few words here in the addenda. In particular the (Swedish) Vintons, in the Derwent Valley long before the Germans arrived, deserve mention.

THE SAUGUS IRON WORKS: (extracts from William A. Griswold)



Originally called "The Iron works at Lynn" the American entry into the iron industry began early in the colonial period. First attempts were made at Falling Creek, Virginia (ca.1621 – 1622), and at Braintree, Massachusetts (c.1644 – 1647) before they were begun at a site known as Hammersmith in what was then Lynn, Massachusetts.

What made Hammersmith special was that it was the first site to successfully implement the full range of iron production and refinement at one facility, producing cast iron, refined bars, as well as nails. It was established by a consortium of English and colonial investors, the same ones that had set up the earlier Braintree operation. The Saugus facility operated from 1646 to about 1670 on land east of the Saugus River. Hammersmith village housed a community of skilled ironworkers and their families.

The village contained workmen's houses and gardens, an orchard and a field of English grass adjoining the orchard. Hammersmith was a forerunner of America's mill towns built exclusively for the families of an industrial working class.

Theirs were modest dwellings, valued at between two and twelve pounds, except for a long house with four tenements that was valued at £20. The company paid for maintenance on, and improvements to, the workers' homes, which sheltered single families, and extended families with married adult children. Families often boarded bachelor workers and were reimbursed by the company for providing meals.

Vinton in Massachusetts

References to fourteen houses indicate that they were generally clapboarded, probably with thatched or shingled roofs, and that some had cellars and some lean-tos. Many workers raised vegetable gardens as well as sheep or goats. Four workers, John Vinton, John Francis, John Hardman, and Ralph Russell, were each granted their own two-acre plots of land.

Three waterwheels likely powered the three hearths' bellows, while another wheel worked the trip hammer. About ten men ran this complex operation. Among the most highly paid were finers John Turner and John Vinton.

The operation of a slitting mill in the wilds of the Massachusetts Bay Colony at a time when so few operated in the Old World is testimony to the vision and ambition of *The Company of Undertakers of the Iron Works in New England*. About twelve percent of the wrought-iron stock produced at the forge travelled to the slitting mill where it would be heated for several hours; once pliable, a bar was drawn through a set of rollers to make flats which were sold as stock for wheel rims, axes, saws, or scythes. Some flats were slit by large shears into nail rod, which was then bundled for sale to local blacksmiths and other settlers. The demand for nails in the young colony was enormous.

Several forge workers were paid for jobs in the slitting mill, including Joseph Jenks, John Vinton, Ralph Russell, and Nicholas Pinnion. It appears that equipment replacement occurred regularly at the slitting mill. Accounting records show that in 1651, John Vinton was paid for "making 2 roullrs" and that cash was paid "for Steeleing ye Sheares" and for "mendeing the great Sheares"; in 1653, "a new Cogg wheele was installed for ye Slittin mill." It is likely that the cog wheel was paired with a lantern-wheel to set the mill's upper and lower rollers and slitters turning in opposite directions. The slitting mill was probably an ingenious bit of engineering (see page 45).

Jenkes in Massachusetts

On the tailrace of the Saugus blast furnace, cutler Joseph Jenks established a mill for the making of Sithes (sic), saw blades, and other edge tools for which he was granted a Massachusetts patent in 1646: probably one of the first patents ever issued in the colonies.

Jenks brought his millwright and smithing skills to the banks of the Saugus River where he forged, hardened, and tempered iron and steel into saw blades and axes for the ironworks. Jenks also manufactured sawmill blades to support a developing timber industry, drew wire for the making of wool cards and fishhooks, and was called in to assess the value of a grist mill after the death of local miller Edmund Farrington in 1677. After the bankruptcy of the Company of Undertakers in the mid-1650s, Jenks mortgaged his shop (for which he previously paid rent), the rolling and slitting mill, and a grist mill. He imparted his blacksmithing skills to his son, Joseph Jenks, Jr., and apprentice William Curtis.

Jenks, Jr., established a forge shop and sawmill on the Blackstone River in Pawtucket, Rhode Island. Iron tool manufacturing continued within this branch of the Jenks family well into the nineteenth century.

Below: artist's rendering of the first iron works at Saugus.

Finale.

I acquired this sword casket a few years ago from an auction in South Yorkshire.

The plaque reads: *Shotley Bridge circa 1680*

The vagueness of the inscription's date rang a bell: there is a horseman's sword in Bamburgh Castle armoury labelled like this plaque: 'SHOTLEY BRIDGE circa 1680', on loan from the Royal Armouries in Leeds, once the property of Wentworth-Woodhouse.

I was puzzled as to why someone would spend so much money on a luxurious mahogany casket, to house an obvious family heirloom, yet not know its true history.

A little bit of research took me to one Charles Watson-Wentworth, the 2nd Marquess of Rockingham, whose father, 1st Marquess Thomas Wentworth-Woodhouse, inherited his uncle's fortune in 1695. In that inheritance was a Shotley Bridge horseman's sword resulting in a companion for his own father's sword. It was when Charles succeeded his father Thomas in 1750, and inherited the two swords, that *he* commissioned two caskets to house them.

During the takeover of the Wentworth-Woodhouse estate by its Preservation Trust in 2017, the empty casket had been disposed-of, finally ending-up with me. *However*, at this point I knew nothing of a second sword and casket… that came later; so how did I discover it?

Recently my collaborator Paul Heatherington bought the Shotley Bridge Stafford family's horseman's sword (see below) and it came in an identical casket and plaque. Conceive my amazement!

Establishing the circumstances responsible for two identical caskets has revealed the aforesaid facts. But while it has been in the Stafford family for decades, was even shown to the Prince of Wales on his 1982 visit to Consett Steel Works, up till now we have been unable to uncover any earlier provenance of this sword and its casket.

SUPLEMENTARY MATERIAL

Intro

This is pertinent additional material added here out of pure laziness due to the hassle of re-paginating/indexing everything when adding data in its relevant place in the main narrative.

So much fresh information is turning up on a constant, albeit occasional, basis as a result of both fresh attention on my part and fresh input from ever widening sources as my work is globally disseminated. Also, like the addenda, much of this material may be of specialised interest only.

Often, when it is a result of fresh thinking, it can live here quite happily.

VILLAGE LIFE

Johannes Dell left Hounslow in 1685 and, as a member of the Crown commanded syndicate, went up to Shotley Bridge to begin work in advance of the German diaspora. He took Peter Henekels and Heinrich Hoppie with him. In advance of *their* arrival, iron and steel experts William Bertram and John Vinton; plus Wilsons, who were the village black and whitesmiths; also Thomas Carnforth, the Newcastle Cutler; and John Sampford, the Newcastle goldsmith – who was also the syndicate moneyman up in the North – will have procured land, temporary housing, and also established necessary facilities within the village.

It was 1687 by the time the Solingen contingent arrived. We have to assume that established working facilities will have been in place, as Dell had plenty of experienced help and unlimited funding, therefore local labour will have been in place before he arrived thanks to Bertram, Vinton and the Wilsons.

Ready forged blade blanks came from Solingen with the diaspora and they will have been hilted by Carnforth and the village Wilsons (question! did the Wilsons have a brass foundry?); these will have been supplied to local gentry while Oley and Mohll were setting up their forge, mill and the machines. If there was one thing was for sure it was Oley, Vinton and Bertram's ability to build forges, and the Mohlls a grinding mill.

Taking all of the above into consideration, and assuming that the available dates are relatively accurate, I propose that Oley may have been producing blades before the year was out, and it is on this basis that I have dated the double edged smallswords, and the basket hilt shown in the following chapters: effectively, anything with a bushy tailed fox mark.

During 1688, while the Glorious Revolution was getting underway, but before the new 'Williamite' syndicate members came on board and their request for a Royal Charter was delivered, Shotley Bridge was supplying both political factions. Consider the statement in 1846 – reported in the Newcastle Guardian and Tyne Mercury – from an Oley running the Spa Hotel: *"… the visitor can have the highest honour, in Mrs Williams, his hostess, of being the guest of an "Oley." This family, it will be remembered, originally German, had settled here some time in the 17th century, as sword manufacturers,–and during the rebellion were captured, first by one party, and then another, and made to supply the implements of warfare to the belligerents*". The Holles examples, along with the weapons belonging to the Scropes are both pertinent here: one Protestant and one Catholic. Those weapons were marked SHOTLEY BRIDGE in the Holles case, and just SHOTLEY in the Danby Hall stash.

Early commissions, like those smallsword blades and the basket hilted broadsword blade, along with the Pennyman horseman's sword, will have been produced in late 1687 into 1688, the very first blades ever forged in Shotley Bridge. When you consider that the village rapidly became capable of producing 21,000 munitions-grade blades per annum, vast numbers of Northern militia on both sides of the fence will have been supplied with high grade weapons.

EARLY BLADE TYPES

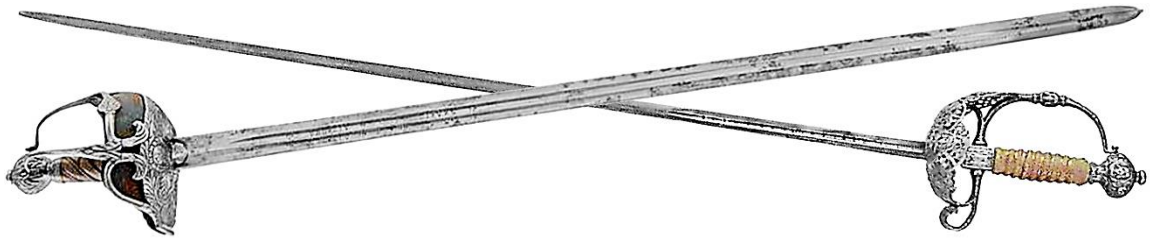
A question has arisen in my mind about the type of blades that Mohll (and possibly Oley) brought with them when they first arrived in Shotley Bridge. Look at the infamous Black Gate Sword of Duke of Northumberland fame:

you will see it is a style of sword commonly referred to as a Horseman's Sword; these Shotley Bridge Horseman's swords were exclusive, which can be qualified by ownership i.e. assigned to wealthy, landed gentry (see pages 67 & 139 for additional examples of this proposition) who would provide militia in service of King James.

At that time, Northern militia often preferred their broadswords, as can be seen from this basket–hilted, 1688/9 Oley made blade:

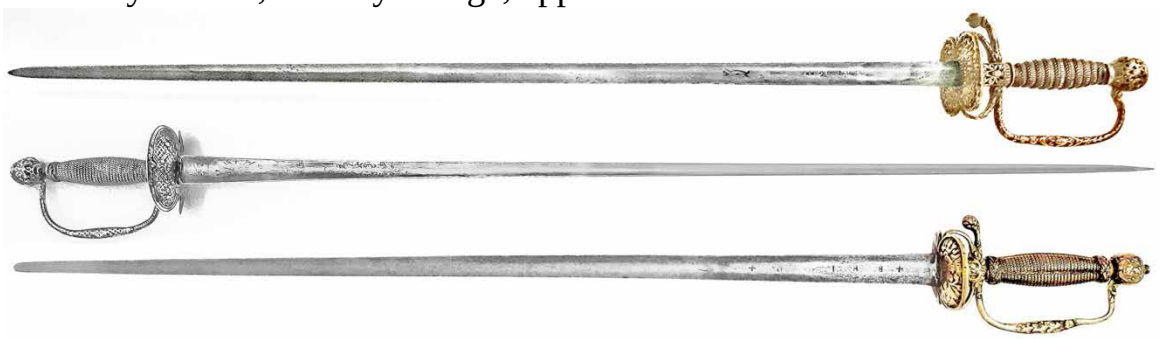
however, most English aristocracy preferred something a little less brutal to wear around the house.

Along with that basket hilt, the Civil War 'Mortuary' hilted backsword or broadsword will have been a common battlefield carry; although the typical Toledo bladed Cavalier rapier was also popular, so it is all a bit haphazard.



Despite the Northern aristo's preference for a less brutal broadsword, many still preferred more weight and cutting ability in their smallswords.

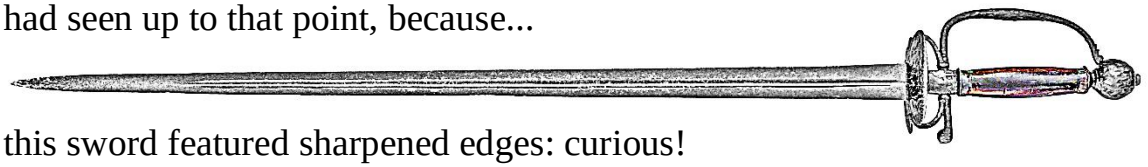
I was recently in detailed discussion regarding those smallswords produced in 1688 for local aristocracy which have Shotley Bridge forged blades with a bushy tailed fox *and* script. What set up the discussion was the style of blade and the overall weight of the sword which, despite having a classic smallsword hilt, was at least 50% heavier than the typical Solingen bladed French smallsword. Comparison, top to bottom: Shotley Bridge; Germany/France; Shotley Bridge; approx. to scale.



Eventually, in 1688 we arrive at the Shotley Bridge 'Epée de Jour:'

GEORGE WASHINGTON'S CUTTING EDGE

Way back at the start of my introduction to arms and armour, I encountered a curious early smallsword that had a rolled groove – yet was not a colichemarde; initial reaction was that it was unlike any hollowed blade I had seen up to that point, because...

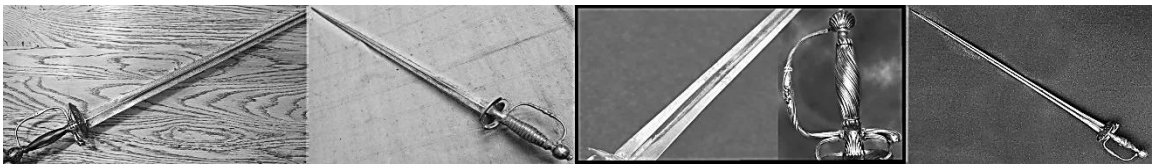


this sword featured sharpened edges: curious!

I put this curiosity on the back-burner as it was not really necessary material for my research into the Shotley Bridge enterprise story, but...

Since that time I have seen, on more than one occasion, similar style blades, and by then I was convinced that rolled fullers were a product of the Mohll machine, therefore these swordblades had come from Shotley Bridge.

I subsequently grabbed any images I came across, and what can be seen is they all have better hilts than are found on purely munitions-grade swords, so were probably officer's personal purchases.



The above is our special example, given to George Washington on his first commission: a 1753 re-hilting by John Carman II in London, this is certainly a Shotley Bridge heirloom blade belonging to one of his recent ancestors in North East England. In 1767 Washington gave it to his sister's son and aide-de-camp Major George Lewis when he purchased his first colichemarde: a silver-gilt hilt on a Shotley Bridge blade by Matthew Feesey, the King's cutler in London, and gold/silversmith Appalone Rudkins; it was sent dissembled, then re-assembled in America.

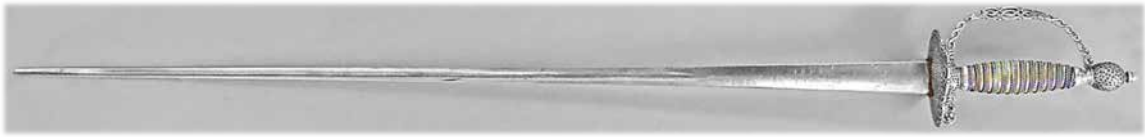
COLICHEMARDES

Before the classic style hollow blade colichemarde became popular in the mid. 1700s, there had long existed what was known as a "squeezed" blade that was not of a trefoil cross-section. Plenty of examples can be found today. This is a c.1760s rehilt and just one of a few variations on this theme.

Few folk have considered the fact that the 'squeezed' blade concept long predated the advent of the hollow blade colichemarde, was certainly easier and cheaper to make, so continued to be used after both styles became available, sometimes sporting a very long, narrow foible.

As an aside, I suspect that it was this style of blade that was referred-to by fencing master Sir William Hope in 1707 regarding the 'Köningsberg' blade favoured by Otto von Wilhelm Königsmarck when suggesting the possible origin of the name colichemarde, yet almost always rejected because of the dates, but it is perfectly valid if you accept that Hope did not refer to the classic hollow blade that was later associated with the name colichemarde. I have been totally unable to find anyone or any text that definitively dates the advent of the trefoil colichemarde.

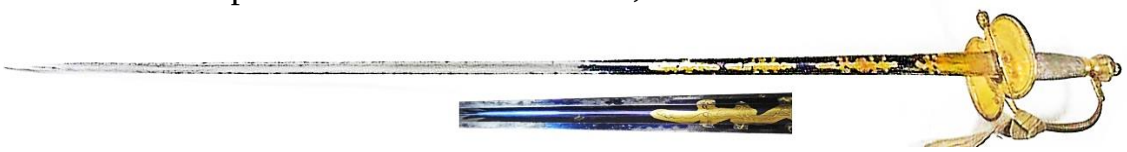
The first thing I found of interest during my initial research into the Shotley Bridge story was that hollow colichemarde blades differed from the bulk of smallsword blades in that – without exception – they all featured a groove in the broad face. This was of constant width as opposed to a constantly reducing radius. Also, it is a style of fuller that I found on many non-colichemarde blades; this William Kinman below is curious because it has no vulgar shoulder, which is not visually pleasing anyway, but it does enjoy an extra broad fort, consequently an attractive, successful happy medium.



By the last quarter of the 18th century, when Shotley Bridge sword manufacture had ceased concentrating on smallswords, Moles and Oleys took their skills and those machines down to Birmingham.

I found this George III smallsword that features the machine rolled groove and has Gill's warranties stamped on the ricasso. It was marked as a special commission from a Naval officer, so was an appropriately short blade (27") but with a sizeable hilt.

This other example is also from Gill: a fine, late 1700s rolled smallsword.



I've seen others, but I'm confident Gill could not have produced these blades without German help. Do we not wonder how the Gills suddenly managed to produce a standard of blade that rivalled the Solingen output: I am certain Oleys or Mohlls had a lot to do with it, but read on…

THE SWORD WARS

EXTRACTED FROM "THE RECOLLECTIONS OF MR THOMAS GILL SR.".

"One of the most important pursuits, which Mr. Gill ever engaged in, was his retrieving the reputation of English swords."

Mr Thomas Gill Sr. told that he was educated, in the advanced arts of horological metallurgy, by Swiss Huguenots; but in other crafts by specialists from Sheffield and 'elsewhere' (sic). So where in that selection would we find Oleys and Mohlls, who were already working away in Sheffield – and Birmingham. All that aside, here is the adventure in sword blade manufacturing that saw Gill exceed the quality of Solingen imports:

English swords, which, in the year 1783, had fallen into such deserved ill-repute that an English officer would "not trust his life to the hazard of the probable failure of his English sword-blade upon any consideration whatever!" Trouble was, imports from Germany had been banned for the last century. However, in the year 1783, a petition was presented to the Lords of the Treasury by the London sword-sellers, praying leave to import swordblades from Germany duty free, under the degrading idea that those of English manufacture were of an inferior quality.

But, as a friend to the manufacturers of England, the Duke of Norfolk, then Earl of Surrey, and one of the lords of that board, wrote a letter to a gentleman of Sheffield, Mr. Eyre, dated October 1, to the following purport:

"You will please inform those whom it may concern that a petition hath been this day presented to the Treasury praying permission to import swords and sword-blades from Germany, duty free, on account of the inferior quality of English blades. I should be very happy that any ingenious manufacturer of Sheffield would supply me with such information, both as to price and quality, as would enable me to remove so disgraceful a reflection on English ingenuity."

The business of sword making being, however, more immediately within the province of the Birmingham manufacturers, Mr. Eyre sent Mr. Gill an extract from his lordship's letter, who thereupon, in December of that year, presented a memorial to the Right Honourable the Lords of the Treasury stating that "sword-blades could be made by him of as good a quality as those from Germany, and praying that the comparative goodness of those of both countries might be examined into". Consequently, "…the Board of Ordnance would direct a number of foreign swords to be sent to the Tower, and the board would give directions to have their goodness examined and compared with those of Birmingham…." This answer was sent the 7th of January, 1784, and there the business ended! No foreign swords were ever sent to the Tower for the above purpose, nor was any trial of their comparative goodness ever made.

It was not till the year 1786 that Mr. Gill, though he had made repeated and fruitless attempts for that purpose, obtained the object of his pursuit for, on an order for ten thousand horsemen's swords being issued by the East India Company, which was divided indiscriminately amongst English and German manufacturers, Mr. Gill, being still anxious for the comparative proof, presented a petition to the committee of shipping of the East India Company, requesting that all the swords of the different countries and manufacturers might be proved by a test, so as to ascertain the difference of their qualities. This produced an order for that purpose, and a resolution that none but such as on inspection and proofs stood that test, should be received.

Accordingly, when the swords were sent to the company's warehouse, they underwent an examination by a test on a machine, recommended by Matthew Boulton Esq., of The Soho Factory (in Birmingham), for trying the quality or temper of the sword-blades; namely, by forcing the blade into a curved state which reduced its length of thirty-six inches to twenty-nine and

a half inches only, from the point to the hilt. The result of this trial proved, that Mr. Gill had two thousand six hundred and fifty swords received, and only four rejected. That of the German swords: fourteen hundred were received, and twenty-eight rejected, being in the proportion of thirteen to one of Mr. Gill's. And that of the other English swords: two thousand seven hundred were received, and one thousand and eighty-four rejected !

It was owing to the parsimony of the London retailers of swords that the English swords fell into disrepute; the fact was, they employed unskilful workmen, and bought goods of an inferior quality. To corroborate this fact, it may be necessary to relate a case in point :

A London dealer having executed a commission for swords for General Harcourt's regiment of dragoons, prior to its going to North America in the war of the revolution of that country, was called upon by the General on his return to England and upbraided by him in the severest language of reproach for having supplied his troops with swords of so base a quality that they either broke to pieces or became useless in the first onset of an engagement; by which many of his brave soldiers were unworthily slaughtered and his own person exposed to the most imminent danger. In this distressed predicament the contractor applied to Mr. Gill, who had never before supplied him with any sword-blades, in consequence of another regiment wanting some at that time, to know at what price he could render swords of such a quality as to bear what he, the contractor, called a severe mode of trial, namely, striking the sword with violence upon a large flat stone. But Mr. Gill, in answer, told him he thought it by no means so severe as it ought to be to determine properly the real quality of swords; that he would engage to serve him with such as should withstand a much severer test at an advance of only nine-pence for horsemen's and six-pence for small swords more than was given to other makers for those of an inferior quality.

In fact, besides subjecting his sword-blades to the test of bending them in the manner above-mentioned, he caused them to be struck flatways upon a slab of cast-iron, and edgeways upon a cylinder of wrought-iron, usually a piece of a gun-barrel. He would frequently wind one of them around the barrel in the manner of a band, without its breaking; and indeed, the greater part of the blade would recover its original straightness, with the part nearest to the point only remaining in a coiled state.

Further notes on the above.

The impurities in local iron ore: until the development of the port of Hull gave Sheffield access to Swedish bar iron then Benjamin Huntsman's crucible process was developed, this factor contributed greatly to the poor quality of their blades – initially, even Shotley Bridge was not immune to this – and made the production of good steel either too difficult, too lengthy or too expensive. Bertram was so well educated in the production of steel, having been born and raised in Remscheid, Germany's iron and steel heart, then living and working in similar circumstances in Sweden, it was no wonder he was so successful: £250pa net profit from Blackhall Mill.

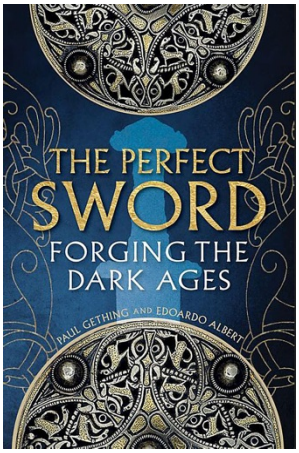
Of course, as we have learned from Gill's testimony, ruthless sword retailers, trafficking the poorest workmanship, did not help our reputation. Again, Shotley Bridge, when governed by local businessman Cotesworth, was tarred with the same brush when, on two occasions, chests of blades were returned with the accompanying note "…they stand like lead…".

Those blades came from Scunthorpe and, at least on one occasion, came a penny a blade cheaper, which makes one very suspicious. However, given Cotesworth's good reputation in general, I think he may deserve the benefit of the doubt and we may declare ignorance to blame; it all depends on what he did with the sub-standard blades afterwards – which we will never know.

THE HIDDEN ONE

Source of 'Billet Welding' in North Western Europe C.500bCe.

Linguist Kim McCone – focusing on the Celts – notes that the title Celt- is found in the names of several ancient Gauls, such as Celtillus: father of Vercingetorix. He suggests it meant the people or descendants of "the hidden one", further noting that according to Julius Caesar's Bellum Gallicum (Gallic War) the Gauls claimed descent from an underworld god.



THE MOLE FAMILY TREE

THE BEGINNING OF A MANUFACTURING COLOSSUS.

From 1832 until 1920, the Mole family's Birmingham munitions enterprise, supplying militia across the Empire, was only ever equalled by Wilkinson Sword.

William Mohll the Elder — **Shotley Bridge** — **Bc1690 1716–Dc1740**

- In 1724, William Mohll the Elder sold his mill to Robert Ohlig the Elder.

John Moll the Elder — **Shotley Bridge** — **Bc1710–Dc1770**

- Son of William Mohll the Elder.
- Changed his name to Moll.

William Moll the Younger — **Shotley Bridge** — **Bc1740–Dc1790**

- Son of John Moll the Elder.

John Moll the Younger — **Shotley Bridge** — **Bc1780–Dc1832**

- Son of William Moll the Younger.
- John Moll moved to Birmingham in 1832.

John Moll the Younger (Jr.) — **Broad St., Islington** — **1832–1834**

J. (John Jr.) & R. (Robert Sr.) Mole — **Broad St., Islington** — **1835–1837**

- Robert Mole Sr. was the son of John Moll Jr.
- They changed their name to Mole.

John (Jr.) & Robert (Sr.) Mole — **171 Broad St., Islington** — **1837–1846**

- John Mole Jr. died in 1846.

Robert Mole (Sr.) — **171 Broad St., Islington** — **1847–1855**

Robert Mole (Sr.) & Son — **171–172 Broad St., Islington** — **1856–1874**

- Son and partner: Robert Mole (Jr.).
- They became a large sword maker, selling many swords to the British Ordnance Department.
- Sold swords to both sides during the American Civil War.
- Sold brass-hilted M1853 cavalry sabers to the confederates and M1821 cavalry sabers to Tiffany & Co., which sold the swords to the Union government.
- Swords were marked R.M.S.B., Robert Mole & Son, Birmingham.

Robert Mole (Sr.) & Son — **238–239 Broad St., Islington** — **1875–1879**

Robert Mole (Sr.) & Son — **93 to 99 Granville St., Broad St.** — **1880**

Robert Mole (Jr.) — **24 to 34 Granville St.** — **1881–1894**

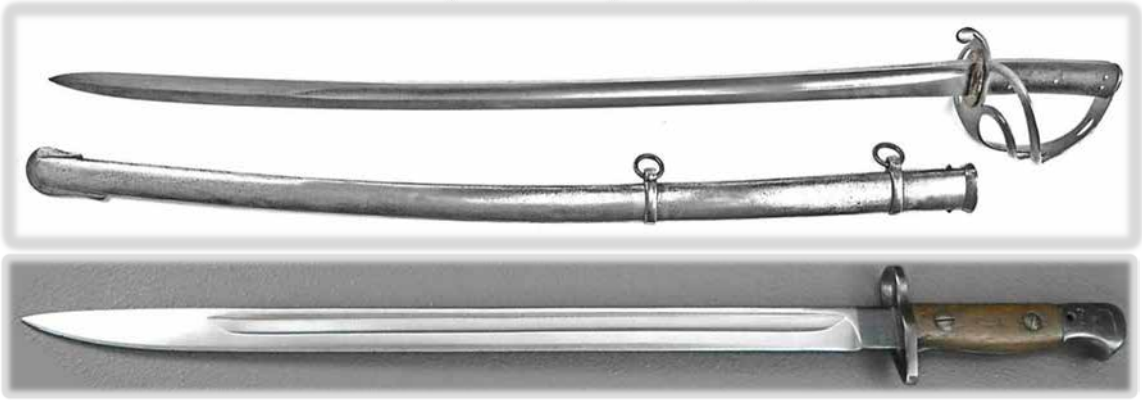
- Also made bayonets.
- In 1884, Mole allowed Wilkinson (Henry) & Son to borrow bladesmith Tom Beasley, sword maker Ernie Johnson, and sword maker Walter Johnson to help with a special project.

Robert Mole (Jr.) & Son — **24 to 34 Granville St.** — **1895–1920**

- In 1920, Wilkinson Sword Co. Ltd. purchased the Robert Mole & Co. sword division and Mole moved to Aston Newtown.

Robert Mole & Son — **Alma St., Aston Newtown** — **1921–1967**

- At Aston, Mole made axes, hatchets, edged tools, and agricultural implements.



CRANSTONE: NOTES ON DERWENTCOTE

Cranstone states: My work at Derwentcote was on behalf of English Heritage, who had taken the ruinous furnace into guardianship, and were conserving it for public display. It consisted of excavation, recording of the standing structures, historical research, a degree of landscape survey (by the then Royal Commission on Historical Monuments), and archaeo-metallurgical examination of slags and other process residues, more-or-less in that order. Since the excavation was targeted on the needs of conservation and public display, rather than academic priorities, it focussed entirely on the furnace, ancillary buildings, and their immediate exterior, with no investigation of the forge area, or of the slopes between the furnace and the forge which formed the main dumping areas for process residues, building debris, and any artefact assemblages from the use of the furnace.

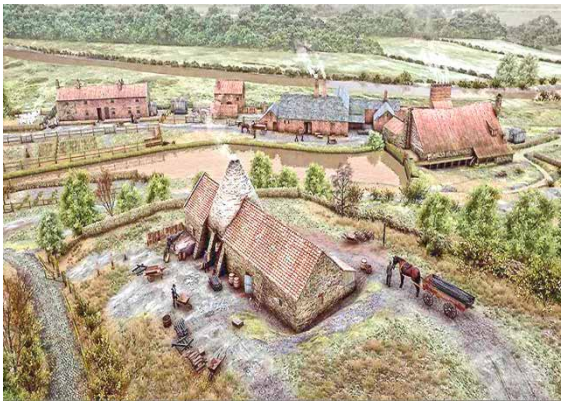
Let's start, as we so often do in reports, with the historical evidence. Medieval bloomery ironmaking was widespread in County Durham, using both the (phosphoric) Coal Measures ironstones of the central zone of the county and the (often non-phosphoric) replacement orebodies of the Weardale area to the West. Within the Derwent valley, there was a bloomery forge at Gibside (about 3 miles downstream from Derwentcote) by 1533; a new lease in 1613 gave permission for construction of a blast furnace, though there is no confirmation that this was actually done. There was also a mid-16th century blast furnace at Wheelbirks, just outside the Derwent catchment but only 6miles west of Derwentcote. There was also a mid-17th century attempt at steelmaking somewhere in Weardale; this appears to have produced good steel but to have failed commercially due to its remote location. The technology of this works is not known; it was not necessarily a cementation furnace. However its existence indicates that the suitability of Weardale ores for steelmaking was known.

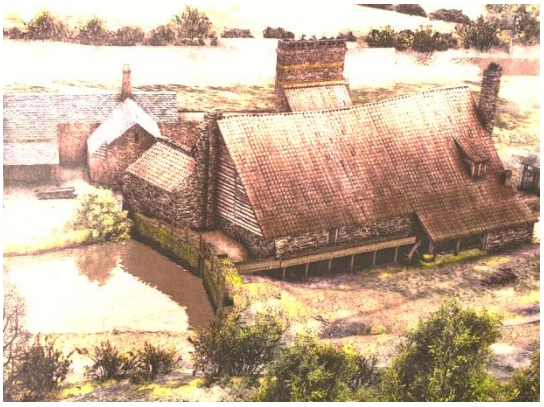
From the 1690s onwards, one of Hayford's furnaces was operated by William Bertram, a German, from Remscheid, and by 1720 Bertram was definitely the operator of Blackhall Mill. Although Hayford's company and the Swordmakers appear to have been formally separate operations, Hayford was certainly supplying steel to the Swordmakers, and it seems likely that the links were in fact close. Bertram was clearly a cementation 'converter', and also seems to have introduced the manufacture of shear steel (produced

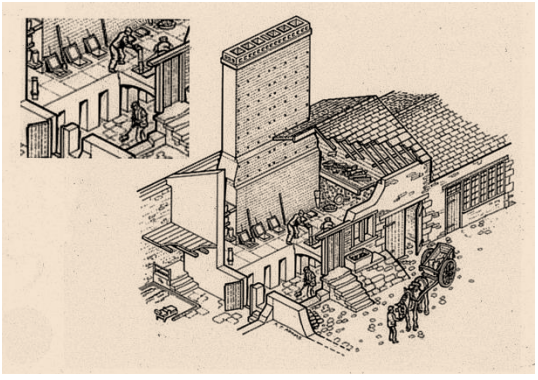
by bundling highly-carburised blister steel bars into ‘faggots’, which were repeatedly forged down to produce an almost-homogenous but finely-laminated product). Despite its alternative name of ‘German steel’, the relatively large-scale production of shear steel by cementation and forging of faggots came be known as the ‘English method’, and Newcastle steel (ie steel exported via Newcastle from the Derwent valley, as well as any production in Newcastle itself) had an international reputation until it was eclipsed by Sheffield crucible steel in the mid 18th century.

Derwentcote was using Bertram’s ‘shear’ trademark, and the steel converter was a former apprentice of Bertram’s. The forge continued to operate as a finery (using scrap iron, so seemingly not of any particular high quality) as well as forging the steel from the furnace. Both furnace and forge operated through the remainder of the 18th century, with more rapidly-changing partnerships; they may then have been mothballed in the early 19th century in favour of Blackhall Mill, before being reopened in the 1830s with the closure of Blackhall Mill.

Below: artists impressions for English Heritage: furnace and forge.







Cementite furnace interior; forge, and crucible conversion.