



**Hawley
Collection**
@ Kelham Island Museum

HOW IT WAS MADE

Handles and Scales

The handle or 'haft' ('heft') is the part of a tool or object by which it is held and which allows the user to control its use. Depending on the object or tool to which it is attached, a handle can be used with one or both hands, e.g. hammer – one hand, axe – two hands.

Handles can be made in one or more pieces, e.g.:

- One solid piece – table knife handle, wooden chisel handle

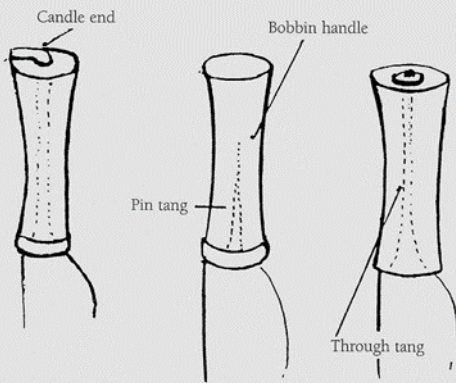
- Two pieces soldered together – silver knife handles

- Two flat pieces – known as scales – razors, pen and pocket knives, trade knives (butchers'), table knives/forks

They are attached to the tool by a tang - whittle or scale – and can have plain or decorative pieces attached at the end – a finial or terminal – and where they are joined to the tool/blade – a ferrule.



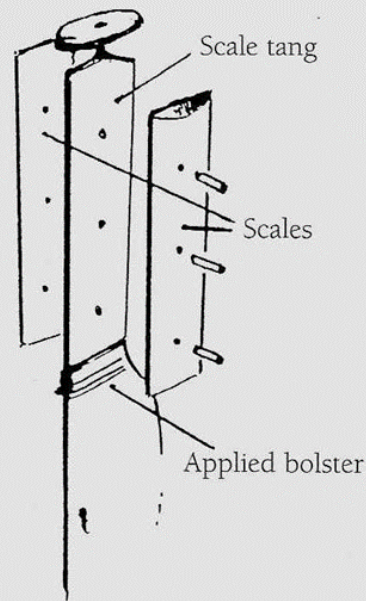
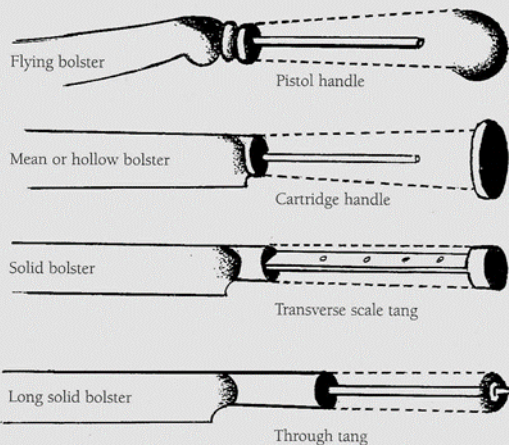
Parts of a handle



Left - Diagrams of types of tangs, 'British Cutlery' Glossary p. 156

Below - Diagram of scale tang, 'British Cutlery' Glossary p.156

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Through time handles have been made of a wide variety of natural materials – animal bone and horn including ivory, mother-of-pearl shell and tortoiseshell, wood, metals (iron, silver, gold, stainless steel), gemstones (agate, quartz) and created materials – ceramics, enamel, glass, plastics (xylonite). In some cases they were inlaid with gold or silver or beautifully carved.

By the mid-1600s Sheffield was well known for the manufacture of cutlery – table knives, trade knives, razors and scissors. At that time the tool or knife was usually made by one person, including the making and fixing of the handle. The increase in the cutlery trade in the 1700s and 1800s led to the manufacture being broken down into separate tasks carried out by a different craftsman (or woman) either within a larger company or as outworkers. (See David Hey, 'A History of Sheffield', 2005.) Many new trades became established solely making handles or parts for handles, e.g. horn cutters, horn pressers, pearl cutters, scale-pressers, haft-pressers, pearl/horn fluters (carvers), wood turners, ferrule and terminal makers. Handles were made in Sheffield of all the materials mentioned except for the following which were supplied to cutlery makers ready-made - agate (mainly from Germany), ceramics (China and European and UK porcelain makers), glass (Italy), enamel (Germany, France and Staffordshire).



Handles or scales made from various materials, clockwise from top left: wood, ivory, glass, horn, mother-of-pearl, mother-of-pearl and tortoiseshell



Pocket knife with tortoiseshell scales inlaid with silver piqué work, 1700, 'Cutlery for the Table' by S.Moore

Today, the trade has reverted to the position up to the 1700s, the 'cutler' or small company making bespoke items from start to finish, e.g. Stan Shaw (pocket knives at Kelham Island), Stuart Mitchell (hunting knives) at Portland Works. There are three small firms remaining selling mostly pocket knives, Bowie knives, and trade knives using some of the traditional handle materials (Egginton Brothers Ltd. on Allen Street, Jack Adams Ltd. on Scotland Street and Taylors Eye Witness on Milton Street). One firm produces silver plated cutlery (Carrs Silver in Beighton) and Woodware Repetitions Ltd. (George Barnsley & Sons Ltd.) on Mowbray Street continues to make and supply wooden handles for tools.

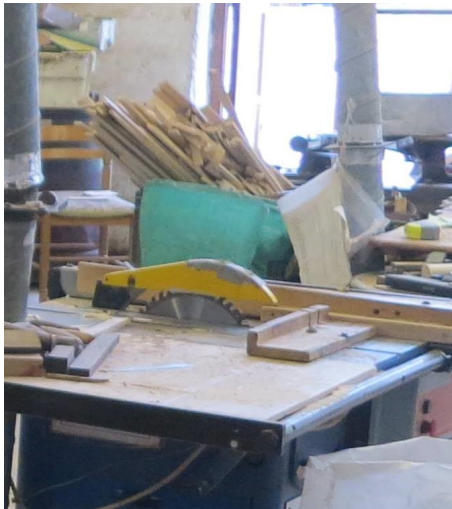
Process of Manufacture

Where the techniques are similar the process of manufacture of handles, and scales in particular materials, has been described together.

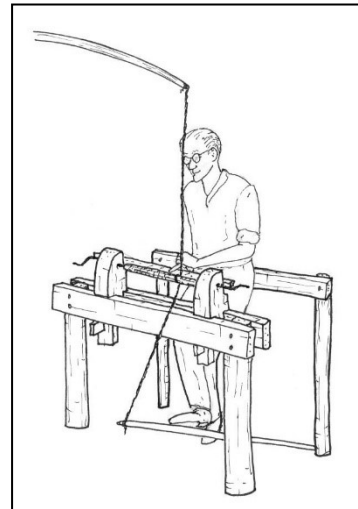
Wood

Preparation

Timber was originally cut to size using various saws, and later bench-mounted circular saws. Today, machines are also used to cut the wood to the correct length and section, e.g. round, rectangular etc.



Left: Bench-mounted circular saw, Woodware Repetitions Ltd., 2016



Right: Diagram of pole lathe in use

Shaping

Before the advent of belt-driven machinery in the early 1800s, the shaping would have been carried out by hand using a chisel or gouge and a manual or pedal-operated lathe. The chisel/gouge would have been pressed against the piece of timber held on the shaft of the lathe which would be rotated.

Today, handles (and scales) are shaped using a variety of machines depending on the desired shape, e.g. rotary turning machines, copy lathes, routers or computer-controlled lathes and routers (CNC).



Rotary turning machine, Woodware Repetitions Ltd., 2016

Finishing

Originally this would have been done entirely by hand, handles being smoothed by rubbing using an abrasive material, e.g. emery. Later moving belts covered with abrasive material, and today a combination of abrasive belts and machines are used for this operation.

Handles may then be dyed, waxed, lacquered or a combination of these. Methods of applying these finishes involve dipping the handles or rotating them in barrels.

Larger manufacturers today often use fully automated computer-controlled machinery for these finishing processes, e.g. spraying or electrostatic spraying of handles.

Horn and Tortoiseshell

Preparation

Originally **horn** was cut using a bow or butcher's type hand saw, and by the 1800s with a bench mounted circular saw. The solid tips or ends of the horn (and the solid tines of deer horn) were used for handles, the hollow or soft-centred pieces were cut to the correct thickness to make scales.



Walter Swift cutting horn – EPH.17

The scutes on the turtle carapace (skeleton) were separated from the carapace by heating to provide the **tortoiseshell** pieces.

Shaping

The solid tips or tines of **horn** were often used as they were, e.g. for the handles of larger knives. If a small amount of shaping of the horn was required, carving tools/files or a pedal-operated lathe would have been used, and later belt-driven and motor-driven abrasive wheels. For more extensive shaping, the solid horn first had to be heated in an oven or by boiling in water and was then placed between two hot metal dies (moulds) and put in a press.

For scales, after warming, slices of horn were cut to the approximate size and placed between two hot iron plates/dies and put in a press as above, and a knife used to trim off any excess.



Horn plates and dies – T.003733

Tortoiseshell is harder and more brittle than horn, but can be shaped in the same way by being softened by boiling in (salt) water and then flattened and shaped in a press for scales. Care had to be taken not to lose the delicate colouring. Gold leaf was sometimes used under the tortoiseshell to enhance the colour.

Finishing

After shaping, the **horn** or **shell** handle or scale was finished on a succession of rotating 'dollies' (buffing wheels), starting with an abrasive material like emery on leather, moving through to calico/linen discs and even swan's down (see Griffin) to give a smooth glossy, shiny finish.



*Glazing and Finishing wheels, Hill Brothers
Horn Handle Works- PH.CUT.0116*

Bone, Ivory, Mother-of-Pearl and Xylonite

Preparation

Bone had to be boiled to remove all the fat or flesh residue, and was then often bleached before or after being cut to the desired length and thickness using saws and later circular saws.

As with horn, the solid tips of **ivory** were used as they were for handles and the hollow portion cut for scales using saws and circular saws as above. (The larger solid portions were used to make billiard balls.)

Mother-of-pearl shells were sorted by size for different purposes (e.g. the largest shells for fish servers) then cut in half, the thicker part was used for handles and the thinner part to make scales for pocket knives etc.

Pearl could easily be scorched when cutting so it was either dipped in water, or the circular saws were water (later coolant) cooled – see film of Gillott & Son (Pearl Works) Ltd. in the Hawley Gallery.

Xylonite came in sheet form but was often supplied to cutlery or tool firms as rough handles with square edges and a slight taper by Sheffield companies (British Xylonite Co., Ltd., Lee & Crookes Ltd., Joseph Thompson).

Shaping

Bone was cut to shape in the same way as wood using circular saws and then a ‘chipping bill’ (a type of carving tool) used to chip away small pieces or a pedal-operated lathe to produce the final shape needed. As bone is permeable, handles and scales were often dyed green - so that grease marks would be less obvious - or black/brown. They were also sometimes ‘jigged’, or made to look like horn, lines and ridges being cut into them using a file or a lathe and cutting tool.



Ivory handles and scales would have been shaped and decorated in the same way as bone or could be fluted like pearl - see left and below.

Pearl scales were shaped on a ‘thickening machine’ which ground the shell to the specific thickness or pieces were clamped to metal dies or patterns (for the size of scales needed) and then ground on grinding wheels to fit the pattern.

Decorative fluted ivory handles – T.005910

The thicker parts of the **pearl** were ground on a grinding (abrasive) wheel into the basic handle shape known as a 'slab', the grinder dipping the shell in water periodically to prevent scorch. This may then be shaped to a given pattern again on grinding wheels and/or decorative patterns added using files e.g. by a pearl fluter.

The rough **Xylonite** handles were shaped using a file, and later fixed in a specially devised milling cutter, one side being shaped then the handle being turned to shape the other side.

Finishing

A series of buffing wheels would then have been used to polish the surface of the **bone** handles and **pearl** scales in a similar way to horn and tortoiseshell – see above. (Some green dyed bone handles were left unpolished.) By the 2000s, pearl handles were put in mechanical tumbling machines (rotating drums) with waste shell and dilute acid to polish.

Xylonite handles were finished firstly on a stitched 'dolly' with emery paste then given a final gloss polish on an unstitched 'dolly'.

All Materials - Boring

Handles were finally bored, i.e. a hole drilled down the centre from the top, to take the tang of the tool, knife blade etc. Up to the 1800s wood boring tools, e.g. augers, or hand-operated centre drills would have been used to bore the holes or later a belt driven centre/horizontal or vertical drilling machine. In the case of pearl the machine would again be water-cooled. A similar motor driven drilling machine and a high carbon steel worm drill is used today for wooden handles, the handle being held between two cones on a shaft.



*Centre drill, Hill Brothers Horn
Handle Works PH.CUT.0117*

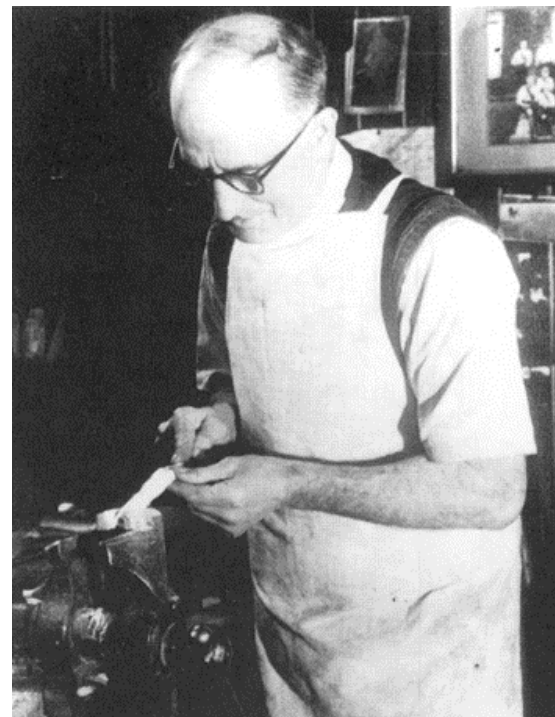
For wooden tool handles, the ferrules are also fitted at this stage. They are slightly smaller than the handle and are today fixed on using an air compressor or a simpler Arbor press. They have a small indent in one side which prevents the ferrule from coming off after fixing.

For other handles, ferrules and end caps were/are added by the knife cutler at the same time as the blade(s).



Left: Arbor press at Woodware Repetitions Ltd. 2016

Below: Francis Hurst - Pearl Fluter - Courtesy of Geoff Tweedale



Decorative Embellishments and Techniques

Fluting

This is a form of ornamental turning performed laboriously by hand or on a lathe (pedal or belt driven), to make spiral grooves or patterns in a cylindrical handle. It was usually applied to ivory, pearl and bone handles, but equally could be applied to wood. Lathes are still used today to make decorative patterns in wooden handles.

Piqué

This technique of inlaying gold or silver wire was performed on both handles and scales made of horn, ivory, bone, mother-of-pearl, tortoiseshell and plastics – see image p.3. There are two forms – *posé* - where strips are inlaid into the material (appearing as lines), and – *clouté*– where points (or dots) form a pattern.

Damascening

Similar to piqué work, this technique is the inlaying of one metal into another, e.g. gold into silver. A groove is first made in one metal with a chisel and wire made of the second metal is hammered into the groove. The surface is then finished, the inlay sometimes being left proud/above the base metal, rather than being flattened and smoothed.

*Iron handle inlaid with silver and gold wire, c.1590, from 'British Cutlery', p.79
Reproduced courtesy of Fairfax House*



Shielding – pocket knife name plates

Scales for pocket knives often had a metal shield or nameplate inserted into one of the scales. This was a skilled task - a two-legged parser was operated by hand to cut out the shape of the shield to the required depth in the scale using a template to guide the drill bits. The metal shield could then be inserted into the recess in the scale – see finished knives with shields on p.3.



*Close-up of a two-legged parser and shield template,
courtesy of Geoff Tweedale*

If you would like more information about handles, scales and related items in the Hawley Collection, please contact us:

via our website: www.hawleytoolcollection.com

by email: enquiries@hawleytoolcollection.com

by telephone: 0114 2010770