Bronze Casting

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Casting bronze involves pouring melted bronze into a mould to make the metal part of a weapon, tool or item of jewellery. Bronze ingots or unwanted objects were melted in a ceramic (pottery) crucible, which had to reach 1200 degrees celcius. The craftsperson had to judge from the colour of the fire and the liquid metal when it was ready to be poured into the mound. If the metal cooled too quickly whilst pouring, or the mould failed, the object would not be usable.

Bronze is a copper alloy, which means the main part is copper but tin and sometimes lead are also added. This makes a metal that is stronger than copper, tin or lead alone. A proportion of 12% tin seems to have worked well. There is copper ore in Scotland, but copper was probably mainly imported as ingots from Ireland and England. Tin and lead were likely to be imported from southwest England.


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Stittenham soapstone mould

Moulds were made of clay, stone or compressed sand. Stone moulds had the desired shape carved out, and could be re-used. They were usually reserved for simple shapes like flat-axes and ingots, but soft stone such as steatite (soapstone) could be carved into more complex moulds, such as the example from Stittenham, Rosskeen. Clay moulds could be shaped or impressed while the clay was wet before hardening, allowing for very fine detail to be added. A clay mould was usually made in two parts which were tied together before the metal was poured in. The mould might then be dropped into water to 'quench' the bronze. Clay moulds were usually broken when the bronze item was extracted.

Some stone moulds and fragments of clay moulds have been found in the Highlands, particularly in the Moray Firth area. This proves that bronze objects were being made in the area, rather than just traded as complete objects. However, very few pieces of crucible, hearths or tools to handle the crucible have been found, so many details of the process are unknown.

The type and form of objects made and used underwent many changes during the Bronze Age. In the early Bronze Age we find flat axes, halberds, daggers (especially in men's graves), awls, razors and bangles. In the Middle Bronze Age bronze flanged axeheads, spearheads and various tools were made. In the Late Bronze Age, the axes and spearheads developed sockets, and we begin to find swords, socketed tools, sunflower pins, and neckrings.


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This small metalworker's hoard from Inshoch Wood near Auldearn contained a portable anvil, hammer head and scrap spear. It is now in Inverness Museum.

It is also possible that the transformational nature of bronze working – from stone, to liquid, to shining metal object – was considered magical. Bronze objects have been found in various bogs and watercourses where they appear to have been placed as offerings. Some of the items had been deliberately broken before being deposited, suggesting an element of sacrifice.

See also:
Box 1 object sheets: Bronze Flat Axes, Bronze Halberd
Box 2 object sheets: Bronze Sickles, Bronze Sunflower Pin, Bronze Socketed Axe, Bronze Gouges, Bronze Swords, Bronze Spear
Additional Images: Bronze Age Metalwork from the Highlands, Late Bronze Age Hoard from Point of Sleat, Skye

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