

## Making armour

### Metal

Iron ore, a rock rich in iron, is found in the earth's crust and is mined like coal. Iron is obtained by melting the iron ore at very high temperatures. Although strong and hard, this heavy grey metal rusts easily.

Steel is formed by melting iron ore and mixing it with carbon in a blast furnace. Steel is harder and tougher than iron and does not rust as easily.

### Mail

Mail was made up of small, linked riveted iron rings. It was a skilled and time consuming art. A mail coat weighed about 9-14 kg (20-31lb). Mail coats worn with iron helmets were gradually replaced by plate armour in a response to weapons development.



A mail maker's workshop.

### Plate armour

Plate armour needed to fit its wearer well if it was to work effectively and not be unbearably uncomfortable, but having an armour made to fit was expensive, and could really only be afforded by wealthy individuals. The overall shape of armour often followed trends in civilian fashion. Some royal and noble owners also displayed their wealth by having the appearance of their armours enhanced with costly etched and gilded decoration.

For the tournament special armour could be made, or those intended for use in battle could have additional pieces to provide extra protection when being used for example, when jousting. Some mobility could be sacrificed and extra weight made acceptable if the armour was only to be used in a particular way and for a short period.

Munition armour was provided to troops in military service and was not made to fit a particular individual. It did, however provide useful protection, and was made to a form for particular types of soldiers, whether infantry or cavalry, or for others such as sappers and miners. Elite guards could even have decoration on their armour, by which their unit might be recognised.

### Fabrication

The raw materials of the armourer's craft were steel plates. Hot sheets of metal were beaten out by heavy

hammers at a battering mill. The armourer, using templates, would cut the shapes needed to make the armour out of these sheets of steel using shears. The piece would then be hammered into the rough shape of the particular part of the armour. The cold metal was then shaped on small anvils or specially shaped stakes; ball-shaped stakes were used for helmets and cylindrical stakes for leg and arm pieces.

### Polishing

After shaping, the armour would look discoloured by fire and dimpled by the hammer blows. The parts now had to be smoothed and polished. This was done on a mill using graded grit stone. The last milling was done with a leather-coated buffing wheel and emery powder for a fine finish. This work was usually done by a specialist millman.

The armour was now ready for decorating. The embellishment was done in a separate specialist workplace away from the dust of the armourer's workshop.

### Dressing to impress

When armour was custom-made for a particular client his measurements would be taken and the armourer would work from flexible card patterns. The decoration could be customised or chosen from a pattern book. Major artists such as Dürer and Holbein were involved in designing armour decoration.

### Inside armour

The inside of the armour might be painted to protect it from rusting caused by condensation from sweat and breath. Padded linings were sewn inside after the decorating process. Hinges, buckles and leather straps were made by a locksmith. Sliding rivets eased the movement of joints.



Emperor Maximilian I in the workshop of his court armourer, Konrad Seusenhofer. Der Weisskönig early 16th century.

### Centres of excellence

The finest armour and weapons were produced in Southern Germany and Northern Italy. Towns such as Milan, Augsburg and Nuremberg were renowned for their master armourers. The wealthy imported armours from abroad, as England had no comparable talent. This particularly galled Henry VIII who could not reciprocate in kind when he was presented with high quality armours by European monarchs. So he set up his own armour workshop in Greenwich staffed by foreign craftsmen, referred to as 'Almayns' (Germans) in contemporary documents. To have an armour made at Greenwich required a royal licence.

### Fashion

16th-century armour tended to follow the forms of civilian dress. Puffed and slashed costume of the early

16th century was copied in armour. A shorter, rounder breastplate developed a central ridge and a longer waist like the Elizabethan doublet (see the Dudley armour below). Longer tassets reflected the voluminous breeches worn underneath. In the 17th century breastplates became shorter and flatter and the tassets covered from the waist to knee. (See cuirassier page 15).

### Garniture

All the different sets of armour that a competitor needed to compete in all the tournament events and the vast expense of having armour made led to the development in the early 16th century of the 'armour garniture'. A complete armour, which would usually be designed for the 'field' (battlefield) was provided with the additional pieces necessary for it to be converted into a tilt, foot combat or tournament armour (see below).



The Almain Armourer's Album shows a similar armour for Robert Dudley including extra pieces of the garniture.



Robert Dudley Earl of Leicester's, armour shown with additional reinforces added for the tilt.