

to an iron rod, which is made to vibrate by the frequent blows of a hammer on the end of the iron farthest removed from that in contact with the silver. The continued action of these vibrations, regulated by the skill of the workman, gradually gives the requisite form to the ornament. The rough development of minute projections is obtained by more pointed irons of a similar description. In order to define more perfectly the form of these projections, the silver vessel is filled with a composition of pitch and ashes; so that blows with punches of various sizes may be applied to any part of its exterior, without injury to the general form. When, by this counter-action, the relief of the ornament is modelled up, the finishing touches and fine edges are given, by means of chasing with the graver. The pitch is melted out, and that portion of the piece of plate is ready for the subsequent processes of cleaning, polishing, &c.

Where certain portions of the object require to be cast, the moulder takes a mould in *intaglio* from the original wax model. Into this mould he lays portions of sheet-clay, answering in substance to the desired thickness of metal. By pouring in liquid plaster at the back of the clay, a core is obtained, on the hardening of which the sheet-clay is removed, and melted wax is poured in between the two plaster-moulds to take its place. The small piece of wax, thus cast, is made to serve as a pattern for the final casting in sand-moulds, the silver being run into the two halves of the mould, so as to fill up the space originally occupied by the wax which was removed to make way for the metal. When the requisite number of these small pieces of silver are cast, and their edges trimmed up, they are neatly fitted one to another. Solder is placed between them, they are connected together by wires, and by the action of a gas blowpipe upon the solder-joints the whole are united. The patience and dexterity required for forming an elaborate piece of work, consisting frequently of from thirty to forty, or even more, of these small castings, may be readily conceived. As an illustration of the extreme difficulty this subdivision of parts involves it may be noticed, that in the formation of the great candelabrum exhibited by Messrs. Hunt and Roskill there were at one time no less than six hundred fragments distributed throughout their workshops, the whole requiring to be adjusted and brought together in the manner described, so as to make up the whole object.

In order to abridge the labour consequent upon the formation of frequently recurring patterns, stamping, by means of steel dies, is often resorted to. These dies, or *forces*, are engraved in *intaglio*, and brought down with a heavy pressure upon sheets of metal placed beneath them, in a manner similar to that we have described in our notice of Plate XLIII. as necessary for the formation of brass die-work. In open silver-work, similar to that which forms the upper portion of the tazza we have engraved, the perforations are cut out by hand, but in common work by means of steel dies prepared for the purpose.

When the article is completely put together, all the imperfections are removed, by *rifles*, and other tools. Every part is carefully chased, so as to give the utmost precision to the ornaments, and variety of texture to the different portions. The whole is then cleaned down and polished, by a succession of rapidly-revolving brushes, in connexion with which various substances of a greater or less degree of fineness are successively employed, until the scratches at first produced by the operation become imperceptible. In those parts in which a dull finish is desired, the effect is obtained by the application of a small metallic brush; and where, on the contrary, extreme brilliancy is required, that result is produced by rubbing the parts with burnishers of steel or bloodstone. A white frosted appearance, or "dead finish," is obtained by covering parts of the object with a coat of pulverised charcoal and saltpetre, or argol, bringing it to a red heat over a charcoal fire, and finally quenching it in a pickle of sal-nixon.

The employment of dies has been carried to so great an extent, that many ordinary objects—such as spoons, forks, &c.—can be formed out of sheet-metal at a single blow.



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GROUP OF PLATE BY GARRARD OF LONDON  
LONDON PRINTED AND PUBLISHED MARCH 1857. BY DAVY & SON, LITHOGRAPHERS TO THE QUEEN.