Technical Methods of the Sculptor.

The production of bronze statues by the *cire perdue* process is described in the article Metal-work, vol. xvi. p. 72 ; this is now but little practised out of Paris.

For the execution of a marble statue the sculptor first models a preliminary sketch on a small scale in clay or wax. He then, in the case of a life-sized or colossal statue, has a sort of iron skeleton set up, with stout bars for the arms and legs, fixed in the pose of the future figure. This is placed on a stand with a revolving top, so that the sculptor can easily turn the whole model round and thus work with the light on any side of it. Over this iron skeleton well-tempered modelling-clay is laid and is modelled into shape by the help of wood and bone tools ; without the ironwork a soft clay figure, if more than a few inches high, would collapse with its own weight and squeeze the lower part out of shape. While the modelling is in progress it is necessary to keep the clay moist and plastic, by squirting water on to it with a sort of garden syringe capped with a finely perforated rose. When the sculptor is not at work the whole figure is kept wrapped up in damp cloths. A modern improvement is to mix the modelling-clay, not with water, but with stearin and glycerin ; this, while keeping the clay soft and plastic, has the great advantage of not being wet, and so the sculptor avoids the chill and consequent risk of rheumatism which follow from a constant manipulation of wet clay. When the clay model is finished it is cast in plaster. A “piece-mould” @@ 1 is formed by applying patches of wet plaster of Paris all over the clay statue in such a way that they can be removed piecemeal from the model, and then be fitted together again, forming a complete hollow mould. The inside is then rinsed out with plaster and water mixed to the consistency of cream till a skin of plaster is formed all over the inner surface of the mould, and thus a hollow cast is made of the whole figure. The “ piece-mould ” is then taken to pieces and the casting set free. If skilfully done by a good *formatore* or moulder the plaster cast is a perfect facsimile of the original clay, very slightly disfigured by a series of lines showing the joints in the piece-mould, the sections of which cannot be made to fit together with absolute precision. Many sculptors have their clay model cast in plaster before the modelling is quite finished, as they prefer to put the finishing touches on the plaster cast,—good plaster being a very easy and pleasant substance to work on.

The next stage is to copy the plaster model in marble. The model is set on a large block called a “scale stone,” while the marble for the future statue is set upon another similar block. The plaster model is then covered with a series of marks, placed on all the most salient parts of the body, and the front of each “ scale stone *” is* covered with another series of points, exactly the same on both stones. An ingenious instrument called a pointing machine, which has arms ending in metal points or “needles ” that move in ball-socket joints, is placed between the model and the marble block. Two of its arms are then applied to the model, one touching a point on the scale stone while the other touches a mark on the figure. The arms are fixed by screws in this position, and the machine is then revolved to the marble block, and set with its lower needle touching the corresponding point on the scale stone. The upper needle, which is arranged to slide back on its own axis, cannot reach the corresponding point on the statue because the marble block is in the way ; a hole is then drilled into the block at the place and in the direction indicated by the needle, till the latter can slide forward so as to reach a point sunk in the marble block exactly corresponding to the point it touched on the plaster mould. This process is repeated both on the model and on the marble block till the latter is drilled with a number of holes, the bottoms of which correspond in position to the number of marks made on the surface of the model. A comparatively un­

skilled *scarpellino* or “ chisel-man ” then sets to work and cuts away the marble till he has reached the bottoms of all the holes, beyond which he must not cut. The statue is thus roughly blocked out, and a more skilled *scarpellino* begins to work. Partly by eye and partly with the constant help of the pointing machine, which is used to give any required measurements, the workman almost com­pletes the marble statue, leaving only the finishing touches to be done by the sculptor.

Among the ancient Greeks and Romans and in the mediaeval period it was the custom to give the nude parts of a marble statue a considerable degree of polish, which really suggests the somewhat glossy surface of the human skin very much better than the dull loaf-sugar-like surface which is left on the marble by modern sculptors. This high polish still remains in parts of the pedimental figures from the Parthenon, where, at the back, they have been specially protected from the weather. The Hermes of the Vatican Belvidere is a remarkable instance of the preservation of this polish. Michelangelo carried the practice further still, and gave certain parts of some of his statues, such as the Moses, the highest possible polish in order to produce high lights just where he wanted them ; the artistic legitimacy of this may perhaps be doubted, and in weaker hands it might degenerate into mere trickery. It is, however, much to be desired that modern sculptors should to some extent at least adopt the classical practice, and by a slight but uniform polish remove the disagreeable crystalline grain from all the nude parts of the marble.

A rougher method of obtaining fixed points to measure from was occasionally employed by Michelangelo and earlier sculptors. They immersed the model in a tank of water, the water being gradually allowed to run out, and thus by its sinking level it gave a series of contour lines on any required number of planes. In some cases Michelangelo appears to have cut his statue out of the marble with­out previously making a model—a most marvellous feat of skill.

In modelling bas-reliefs the modern sculptor usually applies the clay to a slab of slate on which the design is sketched ; the slate forms the background of the figures, and thus keeps the relief absolutely true to one plane. This method is one of the causes of the dulness and want of spirit so conspicuous in most modern sculptured reliefs. In the best Greek examples there is no ab­solutely fixed plane surface for the backgrounds. In one place, to gain an effective shadow, the Greek sculptor would cut below the average surface ; in another he would leave the ground at a higher plane, exactly as happened to suit each portion of his design. Other differences from the modern mechanical rules can easily be seen by a careful examination of the Parthenon frieze and other Greek reliefs. Though the word “bas-relief” is now often applied to reliefs of all degrees of projection from the ground, it should, of course, only be used for those in which the projection is slight; “basso,” “mezzo,” and “alto rilievo” express three different degrees of salience. Very low relief is but little used by modern sculptors, mainly because it is much easier to obtain striking effects with the help of more projection. Donatello and other 15th- century Italian artists showed the most wonderful skill in their treatment of very low relief. One not altogether legitimate method of gaining effect was practised by some mediæval sculptors : the relief itself was kept very low, but was “stilted” or projected from the ground, and then undercut all round the outline. A 15th-century tabernacle for the host in the Brera at Milan is a very beautiful example of this method, which as a rule is not pleasing in effect, since it looks rather as if the figures were cut out in cardboard and then stuck on.

The practice of most modern sculptors is to do very little to the marble with their own hands ; some, in fact, have never really learnt how to carve, and thus the finished statue is often very dull and lifeless in comparison with the clay model. Most of the great sculptors of the Middle Ages left little or nothing to be done by an assistant ; Michelangelo especially did the whole of the carving with his own hands, and when beginning on a block of marble attacked it with such vigorous strokes of the hammer that large pieces of marble flew about in every direction. But skill as a carver, though very desirable, is not absolutely necessary for a sculptor. If he casts in bronze by the *cire perdue* process he may produce the most perfect plastic works without touching anything harder than the modelling-wax. The sculptor in marble, however, must be able to carve a hard substance if he is to be master of his art. Unhappily some modern sculptors not only leave all mani­pulation of the marble to their workmen, but they also employ men to do their modelling, the supposed sculptor supplying little or nothing but his name to the work. In some cases sculptors who are neither one nor the other, but who suffer under an excess of popularity, are induced to employ aid of this kind on account of their undertaking more work than any one man could possibly accomplish,—a state of things which is necessarily very hostile to the interests of true art. As a rule, however, the sculptor’s *scar­pellino,* though he may and often does attain the highest skill as a carver and can copy almost anything with wonderful fidelity, seldom develops into an original artist. The popular admiration

*tura*, Florence, 1568, vol. i., and his *Vite dei Pittοri, &c.,* ed. Milanesi, Florence, 1880 ; Rumohr, *Italienische Forschungen,* Leipsic, 1827-31 ; Dohme, *Kunst und Künstler Italiens,* Leipsic, 1879 ; Perkins, *Tuscan Sculptors,* London (1865), *Italian Sculptors (1868), and Hand-book of Italian Sculpture* (1883); Robinson, *Italian Sculpture,* London, 1862 ; Grüner, *Marmor · Bildwerke der Pisaner,* Leipsic, 1858 ; Ferreri, *L'Arco di S. Agostino,* Pavia, 1832 ; Symonds, *Renaissance in Italy,* London, 1877, vol. iii. ; Crowe and Cavalcaselle, *Hist. of Painting in Italy,* London, 1866, voL i. ; Selvatico, *Arch. e Scultura in Venezia,* Venice, 1847 ; Ricci, *Storia dell' Arch. in Italia,* Modena, 1857-60 ; Street (Arundel Society), *Sepulchral Monuments of Italy,* 1878 ; Gozzini, *Monumenti Sepolcrali della Toscana,* Florence, 1819 ; De Montault, *La Sculpture Religieuse à Rome,* Rome, 1870—a French edition (with improved text) of Tosi and Becchio, *Monumenti Sacri di Roma,* Rome, 1842 ; Cavallucci and Molinier, *Les Della Robbia,* Paris, 1884 ; Cicognara, *Monumenti di Venezia,* Venice, 1838-40 ; Burges and Didron, *Iconographie des Chapitaux du Palais Ducal à Venise,* Paris, 1857 ; Richter, “Sculpture of S. Mark’s at Venice,” *Macmillan's Mag.,* June 1880 ; Temanza, *Vite degli Scultori Veneziani,* Venice, 1778 ; Diedo and Zanotto, *Monumenti di Venezia* . Milan, 1839 ; Schulz, *Denkmäler der Kunst in Unter-Italien,* Dresden, 1860 ; Brinckmann, *Die Sculptur von B. Cellini,* Leipsic, 1867 ; Eug. Plon, Cellini, sa Vie &c. Paris, 1882 ; Moses and Cicognara, *Works of Canova,* London,

1824-28 ; Piroli, Fontana, and others, a series of engraved *Plates of Canova's Works,* s. l. et a. ; Giulliot, *Les Artistes en Espagne,* Paris, 1870; Carderera y Solano, *Iconegrafia Espanola, Siglo XI.-XVII.,* Madrid, 1855-64 ; Monumentos Arquitectonicos *de Espana,* published by the Spanish Government, 1859, and still in progress.

@@@1 Moulds made in one or few pieces, from which the cast can only be extracted by destroying the mould, are called “spoil-moulds.” A large number of casts can be made from a “ piece-mould,” but only one from a “ spoil-mould."