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THE MANUFACTURE OF PORCELAIN AND GLASS

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THE

CABINET CYCLOPÆDIA.

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OF

THE MANUFACTURE

OF

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The segments into which the individual pieces have now been cut, will be wanting in the requisite degree of convexity. Before this can be imparted to them, they must have their brittleness removed, and be considerably softened by heat. When this has been effected, taking an appropriate instrument in each hand, and using them much in the same manner as the dairy-maid employs her wooden spoons in raising a pat of butter, the workman presses the edges of the glass regularly in towards the centre, which is by this means made to rise in a corresponding proportion. The edges are then ground evenly off, and the watch-glass is ready for sale.

Lunette glasses are differently made. These are not segments of spheres, but have their edges abruptly raised, and their interior areas or faces flattened. In forming these lunettes, a much smaller quantity of glass is gathered from the pot than is required in blowing globes for ordinary watch-glasses. A hollow pear-shaped figure is then blown, having the larger end, which is farthest from the extremity of the rod, of the size required for a watch-glass, and the requisite flatness is occasioned by pressing this end, while soft, upon any smooth level surface.

These glasses are necessarily much higher in price than those more commonly used for watches; both because they are made to contain a greater weight of glass, and because, only one form being cut from each hollow pear-shaped figure, the labour expended in the manufacture is proportionally greater.

A very considerable manufacture of glass for the formation of beads is carried on at a place called Murano, situated near the city of Venice. There is nothing peculiar in the composition of the glass made use of for this purpose, nor in the methods employed for its preparation; and although the manufacturers affect great secrecy as to the colouring substances which they mix with this glass, it is not likely that they possess any real advantage over others in this respect, or that they have

made any useful discovery of materials different from those commonly employed in colouring glass.

When upon inspection the coloured glass is found to be in a fit state for working, the necessary quantity is gathered in the usual manner upon the rod, and is blown into a hollow form. A second workman then provides himself with an appropriate instrument, with which he takes hold of the glass at the end which is farthest from the extremity of the rod, and the two men running thereupon expeditiously in exactly opposite directions, the glass is drawn out into a pipe or tube, in the manner of those used for constructing thermometers, the thickness of which depends upon the distance by which the men separate themselves. Whatever this thickness may be, the perforation of the tube is preserved, and bears the same proportion relatively to the substance of the glass as was originally given to it by the blower. In these particulars the workmen of course govern themselves according to the size and description of the beads which are to be made. The glass-house at Murano is provided with a kind of gallery 150 feet in length, and which much resembles a rope-walk, wherein the tubes are drawn out in the manner here described.

Tubes striped with different colours are made by gathering from two or more pots lumps of different coloured glass, which are united by twisting them together before they are drawn out to the requisite length.

As soon as they are sufficiently cool for the purpose, the tubes are divided into equal lengths, sorted according to their colours and sizes, packed in chests, and then despatched to the city of Venice, within which the actual manufacture of the beads is conducted.

When they arrive at the bead manufactory, the tubes are again very carefully inspected, and sorted according to their different diameters, preparatory to their being cut into pieces sufficiently small for making beads.

For performing this latter operation, a sharp iron instrument is provided, shaped like a chissel, and securely fixed in a block of wood. Placing the glass tube upon

the edge of this tool at the part to be separated; the workman then, with another sharp instrument in his hand, cuts, or rather chips, the pipe into pieces of the requisite size; the skill of the man being shown by the uniformity of size preserved between the different fragments.

The minute pieces thus obtained are in the next process thrown into a bowl containing a mixture of sand and wood ashes, in which they are continually stirred about until the perforations in the pieces are all filled by the sand and ashes. This provision is indispensable, in order to prevent the sides from falling together when softened by heat in the next operation.

A metallic vessel with a long handle is then provided, wherein the pieces of glass are placed, together with a further quantity of wood-ashes and sand; and the whole being subjected to heat over a charcoal fire, are continually stirred with a hatchet-shaped spatula. By this simple means the beads acquire their globular form.

When this has been imparted, and the beads are again cool, they are agitated in sieves, in order to separate the sand and ashes; this done, they are transferred to other sieves of different degrees of fineness, in order to divide the beads according to their various sizes. Those of each size are then, after being strung by children upon separate threads, made up into bundles, and packed in casks for exportation.

In this manner, not fewer than sixty different kinds of glass beads are prepared in vast quantities. The principal trade in these is carried on with Spain and the coast of Africa; but some portions find their way to nearly all parts of the world.

Another and a more costly description of glass beads, made in imitation of pearls, has long been produced in France. Although the name of the inventor of these ornaments has been faithfully preserved, the period of their invention is not precisely known. Reaumur, on whose assertions the greatest reliance may generally be placed, states this to have occurred in 1656. An anec-

dote related by Beckmann * of a cheat successfully played off upon a lady by a French nobleman, leads to the conclusion that thirty years later than the period here mentioned, these mock pearls were far from being generally introduced or even known.

The manner of their invention was this: — M. Jaquin having observed that upon washing a small fish, the *Cyprinus alburnus*, or bleak, the water contained numerous fine particles, having the colour of silver, and a pearly lustre, he suffered the water to stand for some time, and, collecting the sediment, covered with it some beads made of plaster of Paris, the favourable appearance of which induced him to manufacture more of the same kind for sale. These were at first eagerly adopted; but the ladies soon finding that when they were exposed to heat, the lustrous coating transferred itself from the beads to their skin, they were as quickly discarded.

The next attempt of M. Jaquin was more successful. He procured some glass tubes of a quality easily fusible, and, by means of a blowpipe, converted these into numerous hollow globules. He then proceeded to line the interior surface of these with the powdered fish scales, which he called essence of pearl, or *essence d'Orient*. This was rendered adhesive by being mixed with a solution of isinglass, when it was introduced in a heated state inside the globules, and spread over the whole interior surface, by shaking the beads which, for that purpose, were placed in a bowl upon the table. These hollow beads being blown exceedingly thin, in order to produce a better effect, were consequently very tender. To remedy this evil, as soon as the pearly varnish was sufficiently dry, they were filled with white wax, and being then bored through with a needle, were threaded for sale.

An expert workman can blow from five to six thousand small glass globules in a day; but, as some attention is called for in regard to the shape and appearance of these beads, the produce of a man's daily labour will not

* Hist. of Inventions, vol. ii. art. *Artificial Pearls*.

much exceed one fourth of that quantity. The closer to counterfeit nature in their manufacture, these beads are sometimes purposely made with blemishes, and of somewhat irregular forms. Some are made pear-shaped; others are elongated like olives; and others again are flattened on one side, in imitation of natural pearls, which are set in a manner to show only one side.

The fish whose scales are put to this use are about four inches in length. They are found in great abundance in some rivers; and, being exceedingly voracious, suffer themselves to be taken without difficulty. The scales furnished by 250 of these fish will not weigh more than an ounce, and this will not yield more than a fourth of that quantity of the pearly powder applicable to the preparation of beads; so that 16,000 fish are required in order to obtain only one pound of the *essence of pearl.*

Up to a recent period, the heirs of Jaquin, the first inventor, carried on a considerable manufactory of these mock pearls in Paris. The fish are tolerably abundant in the river Seine; but their scales are conveyed from distant parts in much larger quantities than can be procured on the spot, for which purpose they are preserved in volatile alkali.

The dial-plates of clocks and watches are made of opaque white glass, which has acquired the name of enamel. The peculiarly delicate appearance of these, as well as their opaqueness, result from the presence of oxide of tin.

These plates, which are not of greater diameter than twelve inches, are made in one piece; but any which are required to be larger than this, must be formed in separate segments, and afterwards joined together.

In the preparation of dial plates, the first process is that of hammering a thin plate of copper of the requisite size upon a slightly concave anvil constructed of hard wood; for which operation a convex hammer is employed, and in this manner the proper state of convexity is im-