

Venetian glassworkers carried their secrets to foreign lands and beautiful glassware was made in other Italian towns and in many European countries, it was not until the eighteenth century, when cut glass from Bohemia and Silesia came on the market, that the supremacy of Venice was seriously challenged. Since then most European countries have made their contributions to the industry, not the least valuable of which have come from England. More recently still, glass has been adapted to uses hitherto undreamed of, and since the days of London's famous Crystal Palace it has been regarded as one of the miracle materials of the modern age.

From what is glass made? Sand and soda would be a simple answer, but to be technical a typical glass carries 100 parts of sodium oxide, 67 parts of calcium oxide, and 452 parts of silicon dioxide. If the formula is changed or other ingredients added, different kinds of glass are obtained or a *fiasco*, a term that has come to us from the original Italian word for a bottle, results. (The word arose from the fact that if a glassmaker found he was using a bad mixture he would not risk making anything of a special nature and would make a *fiasco* or wine bottle instead. Hence our word meaning a failure). Modern methods have produced hundreds of different types of glass. One American firm makes about 35,000 different glass articles, varying from tiny jewels for instrument bearings to bricks for building.

Some of the methods of manufacture have changed considerably in recent years; others are centuries old. The glassblowers of early times dipped a hollow reed into melted glass and then blew a bubble into the required shape. Today, much the same method is employed. To make a crystal tumbler a glassblower thrusts the end of a thin iron pipe into the melted glass. A lump clings to the long rod and as it

cools it thickens. The expert knows exactly when the lump has cooled sufficiently for him to start blowing. Then with some well-judged puffs and several twists and turns, he transforms the shapeless lump of molten glass into the approximate form of a tumbler. When ready he inserts it into a mould, keeps on blowing, and rotates the glass to prevent mould joints appearing on the surface.

Finishing touches are performed by a chair-worker, who, without taking any measurements, can shape a group of glasses or vases so that no variation can be detected by the human eye. Then the "wetter-off" takes over and cracks off the tumbler from the parent



*A plate of glass three-quarters of an inch thick can support the weight of an elephant with ease*

iron. Usually in hand-made glassware a trace of where the iron was can be found on the finished article, in contrast to the mould markings of machine-made ware.