

copper, &c., impart a crimson, green, or other colour to the outer or feebly luminous cone.

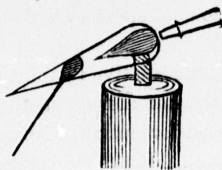


FIG. 8.

For the production of a reducing flame the orifice of the blowpipe must not be too large. The point is held just on the outside of the flame, a little above the level of the burner or wick, as shewn in Fig. 8. The flame, in its deflected state, then retains the whole or a large portion of its yellow cone. The sub-

stance under treatment must be held within this (although towards its pointed extremity), so as to be entirely excluded from the atmosphere; whilst, at the same time, the temperature is raised sufficiently high to promote reduction. As a general rule, bodies subjected to a reducing treatment should be supported on charcoal.

For ordinary experiments, such as testing the relative fusibility, &c., of minerals, the blowpipe may be used with the flame of a common candle. The wick of the candle should be kept rather short (but not so as to weaken the flame), and it should be turned slightly to the left, or away from the point of the blowpipe, the stream of air being blown along its surface. A lamp flame, or that of coal gas, however, gives a higher temperature, and is in many respects preferable. The upper part of the wick-holder (or jet, if gas be used) should be of a rectangular or flattened oblong form, with its surface sloping towards the left at a slight angle.\* Either good oil, or, better, a mixture of about 1 part of spirit of turpentine, or benzine, with 6 parts of strong alcohol, may be used with the lamp. If the latter mixture be used, equal volumes of the two ingredients must be first well shaken up together, and then the rest of the alcohol added. If the wick crusts rapidly, the turpentine will be in excess, in which case another volume of alcohol may be added to the mixture.

## § 4.

## BLOWPIPE OPERATIONS.

The following are some of the more general operations required in

\* The most convenient flame for blowpipe use is that of a small Bunsen burner, into which is dropped a narrow tube (somewhat longer than the tube of the burner, and with sloped and flattened upper surface), to cut off the supply of air and produce a luminous flame. This accessory tube is of course to be removed when bulb-tubes or solutions are heated, or when a substance is ignited without the aid of the blowpipe.