

the platinum vessel during ignition. These tongs should be so constructed as to remain closed except when subjected to the pressure of the fingers. I give a figure of the kind that I employ, because it is much more convenient than the forceps commonly put up in blowpipe cases ; or indeed, than any that I have found described in works on the blowpipe, or in the catalogues of the instrument makers. In using these tongs, the left hand need only be employed. They open by the pressure of the forefinger and thumb upon their sides. (4). A balance. The most convenient kind of balance for use in these operations, is that first contrived by Lingke of Freiburg, for Plattner's assaying experiments. It is figured and described in detail in the fourth edition of Plattner's "*Probirkunst mit dem Löthrohre.*" This balance takes to pieces, and packs with its weights, forceps, &c., into receptacles cut for it in a small box of pear-tree wood, the size of a thin octavo volume. It can be fitted up ready for use, in the course of a few minutes ; and its delicacy is very great. That which I employ, when loaded with three grammes, a greater weight than it is ever required to carry, turns readily with less than half a milligramme, or the 0.0077th of a grain. It is convenient to have counterpoises for the platinum vessels described above, as the weights belonging to the balance only range from a gramme downwards. A small platinum capsule forms the best kind of counterpoise. It can be trimmed down by a knife or pair of scissors, until brought, after repeated trials, to the proper weight. In spare places in the box containing the balance that I use, I have cut out receptacles for the two platinum vessels and their counterpoises, and I recommend other operators to do the same ; because these platinum vessels are of frequent use in various experiments unconnected with the present inquiry : as in ascertaining the amount of water in minerals, and so forth.



§ 3. OPERATIONS.

In the examination of Coals, the following operations are necessary : (1.) The estimation of the water or hygrometric moisture present in the coal ; (2.) The estimation and examination of the coke yielded by the coal ; (3.) The estimation and examination of the ash or inorganic matters present in the coal ; and (4.) The estimation of the sulphur, chiefly contained in the coal as FeS^2 .