COAL HEAT AND COMBUSTION.

HEAT is stored up in coal, and is liberated from it by combustion; that is, the burning of coal, which consists of carbon, hydrogen, nitrogen, sulphur, oxygen and ashes; and they have a relative proportion, in different averages, but all having carbon as its, or their, principal part; now let us chemically consider what these elements are that compose coal: 1st. Carbon, which is an extremely important and very abundant element; all organic substance, all things which have life contain it. In the mineral kingdom coal (containing 70 to 85 per cent.) and its different and various forms, also limestone, chalk, marble, etc. All vegetable life is directly dependent upon the presence of the compound of carbon, carbonic acid, which exists in the atmosphere. Carbon is divided into three distinct modifications, namely, (1) the diamond; (2) plumbago, or graphite; (3) ordinary charcoal or lamp-black; of this last there are many sub-varieties. In each of the above forms carbon is an infusible, non-volatile, solid, devoid of taste and smell, and in whatever they may differ they all agree in this: that on being strongly heated in the presence of oxygen they unite with it and form the same compound, an oxide of carbon (CO^2.)

Coke and anthracite coal are impure sub-varieties of carbon, which from a chemical point of view may be classed either with the graphites or charcoals, or still better between them. Coke is the residue resulting from the destructive distillation of soft (bituminous) coal, as in the manufacture of illuminating gas.

Bituminous coal is a substance of vegetable origin which appears to have been formed from plants by a process of slow decay going on without access of air and under the influence of heat, moisture and great pressure. Like vegetable matter, in general, it is composed of carbon and hydrogen together with small proportions of oxygen and nitrogen and a certain quantity of earthy and saline substances commonly spoken of as inorganic matter. On being heated in the air it burns away almost completely, after awhile leaving nothing but the inorganic components as ashes. But when heated out of contact