

from and at 212° F., which we will call E., have average values which are given in the following table :

KIND OF FUEL.	E.
Pure carbon completely burned to CO ²	15
Pure carbon incompletely burned CO.....	4.5
CO completely burned to CO ²	3.9
Charcoal from wood, dry.....	14
Charcoal from peat, dry.....	12
Coke, good, dry.....	14
Coke, average, dry.....	13.2
Coke, poor, dry.....	12.3
Coal, anthracite.....	15.3
Coal, dry, bituminous, best	15.9
Coal, bituminous.....	14
Coal, caking, bituminous, best.....	16
Coal, Illinois (from four mines near St. Louis).....	12
Lignite.....	12.1
Peat, dry.....	10
Peat, with one-fourth water.....	7.5
Wood, dry.....	7.25
Wood, with one-fifth water.....	5.8
Wood, best, dry, pitch-pine.....	10
Mineral oils, about.....	22.6

Impurities in the coal being earthy matter, forms ashes in fires of low temperature, and slag or cinders in fires of high temperature ; water is also present which has to be evaporated, forming steam, and even decomposing into hydrogen and oxygen, thereby absorbing heat which passes off from the furnace ; in the latter case a re-combination may take place, whereby the heat of decomposition is given up, but that used in changing water into steam is lost by being carried off up the stack.

Imperfect Combustion.—Some coal is usually lost with the ashes by falling through the grate bars, especially with such kinds of coal as split in the fire. In some cases this is prevented by wetting the small coal, thus holding it together till when on the fire it swells and cakes by the heat ; it is, however, doubtful if this remedy is an economical one.

Taking all things together, we find in practice that the best coals are the English and Pittsburg soft coals ; next in value the anthracites, which are only inferior by reason of their greater proportion of refuse, and the results are nearly the