CHAPTER I.

ORIGIN, OCCURRENCE, CLASSIFICATION AND USES OF PEAT.

Peat is a combustible substance produced under certain conditions by the slow decay of vegetable matter. The character of peat depends upon the conditions prevailing during this decay and on the nature of the vegetation from which it is formed. To the peat forming vegetation belong nearly all the mosses (especially Sphagnum and Hypnum), heath plants, sea and swamp plants such as rushes, sedges and grasses, trunks and roots of trees, leaves, etc.

According to P. R. Björling and F. T. Gissing* the peat formation is accounted for in the following manner:

"During the growth of the plants the interior walls of the cells are gradually coated with matters, which ultimately become so thick as to impede the free transpiration of oxygen and aqueous vapour, the result of which is a lowered vitality and finally death of the cell. At this stage the plant generally begins to decompose, the contents of the cell disappearing first, then the cell wall, and lastly the spiral fibres. These steps are marked by characteristic chemical changes. The retention of oxygen in the compounds at the time of death promotes fermentation, especially of the nitrogenous substances which yield ammonia, sulphuretted hydrogen and phosphuretted hydrogen. The non-nitrogenous substances, such as the sugars and starches, are converted into the various acids generally yielded by decaying vegetable matter. In course of time the cells become so distended with the products of decomposition that their walls burst and the various gaseous compounds escape. With this new condition of things the further chemical changes assume a different character and the still unaltered vegetable matter is converted into humic and allied acids and carbonic acid, while the soluble compounds slowly pass away in solution. The final result is that the cell is emptied of its contents and deprived of its green colour if it originally contained chlorophyll. The next stage consists of the decomposition of the cell wall, which proceeds more or less rapidly, according as it is or is not incrusted with sparingly soluble lime salts, silicates and resinous matters, and according to the strength of the vegetable acid solutions in which it is immersed. By the evolution of oxygen, aqueous vapour and carbon dioxide there results a mass which contains a large and increased proportion of carbon, a little hydrogen and a little oxygen in a combined form, generally as a yellow-brown ulmin, but often this is subsequently converted by oxidation into the light brown humin. At this stage the vegetable matter is mainly a mixture of ulmin, humin and spiral fibres. The last stage, the destruction of the

* Peat, its use and manufacture.