

several other geological positions, and that such are sometimes, though very rarely, sufficiently productive to be worked for fuel; yielding however generally a coal of very inferior quality.

In taking the following brief view of the several geological localities in which substances either identical with coal, or in an high degree analogous to it, passing into it by a series of insensible gradations, occur, we shall find that these range through the whole suite of formations, beginning in the most recent, and terminating only amidst the oldest with which we are acquainted; and we shall have to remark that the more recent deposits are unequivocally of vegetable origin, and that there is great reason to ascribe those of the middle periods to the same source, in every instance where bitumen is present; yet it seems scarcely possible to ascribe the non-bituminous varieties of carbonaceous beds which occur in the rocks usually esteemed primitive (namely anthracite and plumbago) to similar causes; and in this case therefore we seem obliged to admit carbon, in its simple state as well as in its well known compounds, as an original mineral substance. It might appear therefore that a line of distinction might be drawn between those carbonaceous formations which are of derivative origin, and only introduced as extraneous materials from the vegetable into the mineral kingdom, and those which have belonged primarily to the latter; but in fact to assign such a line is impossible, since the clearly marked and unequivocal extreme forms are found blended together, and passing into each other by a series of middle terms. All that can be done, therefore, in the present state of science is, to state the difficulty and leave it for solution to that more advanced period towards which we are now only securing the approaches, by preparing a firm ground-work of induction from facts. What may be considered as ascertained concerning the conversion of vegetable matter into bituminous and coaly matter will be found shortly summed up from the able statements of Hatchett and Mac Culloch, under the head 'chemical and external characters' of coal.

We now proceed with the proposed enumeration, beginning with the most recent deposits which admit of comparison with the coal-formation.

A. *Alluvial. Peat.* This substance, arising sometimes from the subversion of forests covered by sphagnum palustre, and other mosses, and sometimes from the growth of various maritime and semi-maritime plants on the marshes bordering the coasts, is found among the most modern alluvia, generally covering them; often containing works of human art imbedded, and in many instances still in