

the act of progressive increase. It belongs therefore entirely to an order of causes still in action; the upper parts of its mass present the fibres of the vegetables whence it originates, and which still cover its surface (principally sphagnum palustre) in an almost unchanged state; in the middle part the texture is gradually obliterated, and the mass passes into a compact peat; in the lowest portion this change is carried still farther, and substances very analogous to jet are found; in some instances beds of peat alternate with beds of mud or sand deposited in lakes, or of silt and sand formed in the æstuaries of rivers; in these cases they appear exactly to represent an imperfect and unmaturing coal-formation. See Dr. Mac Culloch's excellent memoirs on this subject.

The present work will contain a further account of this phenomenon in that part of the last book in which alluvial formations are treated.

- B. *Diluvial.* (*Associated with accumulations of gravel apparently resulting from the last great catastrophe that has affected the earth's surface, but unconnected with the order of causes still acting.*) The carbonaceous deposits of this period consist of beds of fossil wood (Lignite) in some places retaining its texture in the most distinct manner, and passing by a series of gradations from this state to that of jet. The mean terms of this series appear on chemical examination to consist of woody fibre in a state of semi-carbonization, impregnated with bitumen, and a small portion of resin; so that of its original proximate principles as a vegetable, the extract has disappeared, the woody fibre and much of the resin, &c. is apparently modified into bitumen.

Bovey Heathfield, in Devonshire, affords an excellent example of this deposit; on the continent similar instances may be cited on the banks of the Rhine between Cologne and Bonn.

- C. *Associated with the overlying basaltic formation known as the newest flatz trap.* This is also a lignite, nearly agreeing with the former. England affords no example of it, but it abounds in the basaltic area of north eastern Ireland, and in almost every tract of this formation on the continent, especially in Hesse and Bohemia.
- D. *Carbonaceous strata associated with the plastic clay and other formations above the chalk.*

The Isle of Wight furnishes an example. See Book I. of this work.

Similar instances occur in the basin of Paris, &c.