

lated, are worthy of notice; we are, however, sure, from various causes, that many valleys have not been altogether worked out by the rivers now running in them; and some natural chronometers have been pointed out by De Luc and others, which rudely limit the length of time during which rivers have flowed, and might be more usefully employed to determine the rate and amount of fluviate action.

Rivers certainly did not excavate the whole valley in which they flow, for they have not even removed the diluvial detritus brought into them from other drainages, and heaped on the previously excavated rocks.

Rivers have certainly not excavated more than an inconsiderable part of their valleys, for otherwise the Lakes of Geneva and Constance would have been long since filled by the sediments of the Rhone and the Rhine, which issue from these lakes of that lovely hue and transparency which marks their total freedom from all tinge of earthy impurity. When, indeed, we look at the small but growing deltas of the heads of the English lakes, as Derwentwater, Windermere, or Ulswater, and consider the Derwent or the Rothay in its time of furious flood, we shall be disposed to set a high value on De Luc's opinion, sanctioned by Cuvier, Sedgwick, and others, that these deltas prove the comparatively recent date of the present disposition of drainage on the surface of the earth. Rivers flow in certain channels, because these were previously formed by convulsions, and violent movements of water; they have exerted all their force in merely smoothing and filling the inequalities of their valleys, and this partial labour they have not accomplished. Will any one, after this, require to be told that rivers did not make their own valleys; and only yield to this truth when, on the chalk and limestone hills, hundreds of valleys are shown him, down which water never runs, and which, indeed, have no trace of a channel?

The upfillings of a valley by the operations of a river ever tend to be formed in horizontal laminæ;