

the altered Highland rocks *overlie* the fossil-bearing series, and in another that they *underlie* them. By an unconscious selection of favourable sections, either of these two mutually destructive views could be supported by what a partisan would naturally claim to be an overwhelming mass of evidence.

(*To be continued.*)

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NOTICES OF MEMOIRS.

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THE FLOOD OF THE CONNECTICUT RIVER VALLEY FROM THE MELTING OF THE QUATERNARY GLACIER. By JAMES D. DANA. (Amer. Journ. Science, vol. xxiii. 1882.)

THE title of this paper indicates its principal contents; the author pictures the general condition of the Connecticut and its tributaries during the progress of the flood, he treats of the origin of the channel-way of the river, of its terraces, and the bearing of the facts on the retreat of the glacier. According to the process described the terrace-plains were formed during the *rise* of the waters. The following conclusions may be read with interest:—

“At the time of maximum flood the ice was not lying along the center of the valley producing the river by its gradual melting, and retreating northward as the river elongated in that direction. The amount of water flowing off with a velocity of three or four or more miles an hour, making the great flood, was too vast to have been generated from a retreating body of ice in the valley. If, as Greenland facts authorize us to believe, sub-glacial rivers of large size and energy were a universal feature of the Glacial era, these streams must have entered on a career of real progress when melting began in earnest. As they enlarged, the icy tunnels they had hitherto occupied would have become widened, and the sub-glacial chambers have extended themselves in all directions, undermining the heavy glacier. And as rapidly as this removal from below went on, the deposition of the materials of the ground moraine—the stones, gravel, earth and clay—long before initiated—would have gone forward, covering with till the glacier-buried land. But subsequently, when the rising streams had volume enough to make the lower range of terraces, along the valleys, the roofs of the tunnels were probably, for the most part, gone. The ice still lay over the land, covering deeply the hills and mountains, but the wide channel-ways were open to the day. Evidence of this is afforded by the fact that these lower terraces, like the higher, are free, with rare exceptions, from deposits or droppings of till or of boulders, such as would have come from an overhanging glacier. But outside of the terrace plains, up the hill-slopes, wherever the ice still remained in force, the till may have continued to fall, adding later to earlier till.”

At the time of maximum flood the ice melted might have reached the amount of a cubic mile per day.

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