

*Successive Phases of Glacial Action in the Alps, and their Relation to the Human Period.*

According to the geological observations of M. Morlot, the following successive phases in the development of ice-action in the Alps are plainly recognisable: —

1st. There was a period when the ice was in its greatest excess, as described at p. 300 et seq., when the glacier of the Rhone not only reached the Jura, but climbed to the height of 2,015 feet above the lake of Neufchatel, and 3,450 above the sea, at which time the Alpine ice actually entered the French territory at some points, penetrating by certain gorges, as through the defile of the Fort de l'Ecluse, among others.

2nd. To this succeeded a prolonged retreat of the great glaciers, when they evacuated not only the Jura and the low country between that chain and the Alps, but retired some way back into the Alpine valleys. M. Morlot supposes their diminution in volume to have accompanied a general subsidence of the country, to the extent of at least 1,000 feet. The geological formations of the 2nd period consist of stratified masses of sand and gravel, called the 'ancient alluvium' by MM. Necker and Favre, corresponding to the 'older or lower diluvium' of some writers. Their origin is evidently due to the action of rivers, swollen by the melting of ice, by which the materials of parts of the old moraines were rearranged and stratified, and left usually at considerable heights above the level of the present valley plains.

3rd. The glaciers again advanced and became of gigantic dimensions, though they fell far short of those of the first period. That of the Rhone, for example, did not again reach the Jura, though it filled the lake of Geneva, and formed enormous moraines on its borders, and in many parts of the valley between the Alps and Jura.